Mayara Goulart de Camargos

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“Esta tese foi elaborada e está apresentada de acordo com as normas da Pós-Graduação do Hospital de Câncer de Barretos – Fundação Pio XII, baseando-se no Regimento do Programa de Pós-Graduação em Oncologia e no Manual de Apresentação de Dissertações e Teses do Hospital de Câncer de Barretos. Os pesquisadores declaram ainda que este trabalho foi realizado em concordância com o Código de Boas Práticas Científicas (FAPESP), não havendo nada em seu conteúdo que possa ser considerado como plágio, fabricação ou falsificação de dados. As opiniões, hipóteses e conclusões ou recomendações expressas neste material são de responsabilidade dos autores e não necessariamente refletem a visão da Fundação Pio XII – Hospital de Câncer de Barretos”.

“Embora o Núcleo de Apoio ao Pesquisador do Hospital de Câncer de Barretos tenha realizado as análises estatísticas e orientado sua interpretação, a descrição da metodologia estatística, a apresentação dos resultados e suas conclusões são de inteira responsabilidade dos pesquisadores envolvidos”.

A todos os participantes deste estudo que dispuseram

do que tinham de mais precioso, íntimo e nobre:

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"Cada um de nós compõe a sua história
Cada ser em si
Carrega o dom de ser capaz
E ser feliz"
Almir Sater e Renato Teixeira, 1990

"...Pra não perder a magia de acreditar na felicidade real
E entender que ela mora no caminho e não no final"
Kell Smith, 2018

SUMÁRIO

1 INTRODUÇÃO 27
1.1 Felicidade 27
1.1.1 Aspectos gerais sobre a felicidade e conceitos 27
1.1.2 Felicidade e atividades de psicologia positiva 32
1.1.3 Felicidade e condições associadas 36
1.1.4 Felicidade e a relação com saúde e qualidade de vida 42
1.2 Instrumentos para avaliação da Felicidade 45
1.3 Aplicação de instrumentos de avaliação 48
1.4 Estudos realizados por meio de redes sociais 49
1.5 Implicações práticas dos resultados deste estudo 51
2 JUSTIFICATIVA 53
3 OBJETIVOS 54
3.1 Objetivo geral 54
3.2 Objetivos específicos 54
4 ARTIGO 1 55
4.1 The Pemberton Happiness Index: Validation of the Universal Portuguese version in a large Brazilian sample 55
4.1.1 Abstract 55
4.2 Keywords 56
4.3 Introdution 56
4.4 Methods 57
4.4.1 Study design and participant selection 57
4.4.2 Sample 58
4.4.3 Ethical issues 58
4.4.4 Data collection 58
4.4.5 Instrument under validation 59
4.4.6 Validation measures 59
4.4.7 Other assessment instruments (developed for the present study) 61
4.4.8 Validation procedures 61
4.5 Results 63
4.5.1Phase I—cultural adaptation 63
4.5.2. Phase II—psychometric properties 64

4.6 Discussion 66
4.7 Ackowledgments 67
4.8 References 68
5 ARTIGO 2 79
5.1 Predictors of happiness and satisfaction with life in a sample of individuals from the brazilian general population who use social networks 79
5.1.1 Abstract 79
5.2 Keywords 79
5.3 Introduction 79
5.4 Materials and methods 79
5.4.1 Study Design 81
5.4.2 Study participants 81
5.4.3 Study site 81
5.4.4 Eligibility criteria 81
5.4.5 Sample size calculation 81
5.4.6 Ethical aspects 81
5.4.7 Data collection instruments 82
5.4.7.1 Sociodemographic and clinical questionnaire and issues potentially associated with the feeling of happiness 82
5.4.7.2 Pemberton Happiness Index (PHI-r) 82
5.4.7.3 Satisfaction with Life Scale (SWLS) 82
5.4.8 Statistical Analysis 83
5.5 Results 83
5.5.1 Pemberton Happiness Index (PHI-r) 83
5.5.2 Satisfaction with Life Scale (SWLS) 84
5.5.3 Decision Tree Model 85
5.6 Discussion 85
5.6.1 Main findings 85
5.7 Limitations of the study 89
5.8 Strengths and practical perspectives 89
5.9 Conclusions 90
5.10 Acknowledgments 90
5.11 References 90
6 ARTIGO 3 103

6.1 The impact of the cancer experience on the perception of happiness of patients and caregivers: a cross-sectional study 103
6.1.1 Abstract 103
6.2 Keywords 104
6.3 Introduction 104
6.4 Methods 105
6.4.1 Study Design 105
6.4.2 Study participants 105
6.4.3 Study site 106
6.4.4 Eligibility criteria 106
6.4.5 Sample size calculation 107
6.4.6 Ethical aspects 108
6.4.7 Data collection instruments 108
6.4.7.1 Questionnaire on socio-demographic and clinical characteristics and issues potentially associated with feeling of happiness 108
6.4.7.2 Pemberton Happiness Index (PHI) 108
6.4.7.3 Satisfaction with Life Scale (SWLS) 108
6.4.7.4 Diener and Emmons' Positive and Negative Experience Scale (PNES) 109
6.4.8 Statistical analysis 109
6.5 Results 110
6.5.1 PHI-r 110
6.5.3 PNES 111
6.5.4 Analyses among patient groups 111
6.5.5 PHI individual scores 112
6.6 Discussion 112
6.6.1 Main findings 112
6.6.2 Strengths and weaknesses 115
6.7 Conclusions 116
6.8 Acknowledgments 116
6.9 References 116
7 ARTIGO 4 125
7.1 What Is Missing for You to Be Happy? Comparison of the Pursuit of Happiness Among Cancer Patients, Informal Caregivers, and Healthy Individuals 125
7.1.1 Abstract 125
7.2 Keywords 126

7.3 Introdution 126
7.4 Methods 127
7.4.1 Study Design 127
7.4.2 Ethical Issues 128
7.4.3 Eligibility Criteria and Study Participants 128
7.4.4 Study Setting and Data Collection 128
7.4.4.1 Data Collection 129
7.4.5 Sample Size 129
7.4.6 Data Analysis 130
7.4.6.1 Word Cloud Analysis 130
7.4.6.2 Content analysis 130
7.5 Results 131
7.5.1 Word Clouds 131
7.5.2 Content Analysis 132
7.6 Discussion 133
7.6.1 Professional Status and Interpersonal Relationships 133
7.6.2 Better Health and Cure 134
7.6.3 ‘‘To Have to Be’’ 134
7.6.4 Nothing Is Missing 135
7.6.5 Study Limitations 135
7.6.6 Conclusions 136
7.6.7 Acknowledgments 136
7.7 References 136
8 ARTIGO 5 145
8.1 Avaliação dos Índices de Desenvolvimento Humano (IDH), Vulnerabilidade Social (IVS) referentes à cidade onde os participantes residiam e percentual de participantes felizes por região do Brasil. 145
8.1.1 Felicidade e satisfação com a vida: potenciais indicadores sociais para mensuração periódica no Brasil? 145
8.1.1.1 Referências 147
9 DISCUSSÃO 149
10 CONCLUSÕES 156
11 REFERÊNCIAS 157
ANEXOS 170
Anexo A - Supplementary Material 1 170

Anexo B - Supplementary Material 2. Questionnaire of socio-demographic, clinical characterization and questions potentially associated to the sensation of happiness 171

Anexo C – Supplementary Table 1. Univariate Analysis for the evaluation of characteristics associated with satisfaction with life measured by the Satisfaction With Life Scale (SWLS) 174

Anexo D - Supplementary Table 2. Univariate analysis for the evaluation of happiness-associated characteristics measured by the Pemberton Happiness Index (PHI-r) as a continuous variable ... 176

Anexo E - Supplementary Table 3. Univariate analysis for the evaluation of happiness associated characteristics measured by Pemberton Happiness Index (PHI-r) Dichotomized 178

Anexo F - Supplementary Material 1. Questionnaire of socio-demographic, clinical characterization and questions potentially associated to the sensation of happiness 180

Anexo G - Supplementary Figura 1. Flowchart of study participant selection 183

Anexo H - Supplementary Material 2. Univariate analysis for the evaluation of characteristics associated with happiness measured by Pemberton Happiness Index (PHI-r) 184

Anexo I - Supplementary Material 3. Univariate analysis for the evaluation of characteristics associated with satisfaction with life measured by Satisfaction with Life Scale (SWLS) 187

Anexo J - Supplementary Material 4. Univariate analysis for the evaluation of characteristics associated with positive affects measured by Diener and Emmon's Positive and Negative Experience Scale (PNES) 190

Anexo K - Supplementary Material 5. Univariate analysis for the evaluation of characteristics associated to negative affects measured by Diener and Emmon's Positive and Negative Experience Scale (PNES) 193

Anexo L - Supplementary Material 1. *Study Recruitment Strategy* 196

Anexo M - Supplementary Table 1. Examples of participants' responses per category and subcategory. 197

Anexo N – Corpo do convite de participação na pesquisa enviados aos *"friends"* dos pesquisadores via *Facebook* (para acesso ao *link* da pesquisa) 201

Anexo O – Processo de seleção dos municípios participantes da coleta de dados por meio do *Facebook* 202

Anexo P – Detalhes dos municípios selecionados para envio de convites para participação no estudo 204

Anexo Q - Corpo do convite de participação na pesquisa enviados via *Facebook* aos possíveis participantes dos municípios selecionados (para acesso ao *link* da pesquisa) 211

Anexo R - Corpo do convite de participação na pesquisa enviados via *WhatsApp* aos possíveis participantes dos municípios selecionados (para acesso ao *link* da pesquisa) 212

Que tal pensar sobre você e sobre sua vida? VOCÊ REALMENTE É FELIZ? 212

Anexo S – Termo de Consentimento Livre e Esclarecido para coleta de dados presencial 213

Anexo T – Protocolo de caracterização sócio demográfica, clínica e questões potencialmente associadas à sensação de felicidade 216

Anexo U – Índice de Felicidade de Pemberton – PHI 221

Anexo V - Escala de Satisfação com a Vida – ESV 222

Anexo W – Escala de Afeto Positivo e Afeto Negativo - EAPN 223

Anexo X - Termo de Consentimento Livre e Esclarecido (inserido como primeira questão do instrumento de avaliação) para *SurveyMonkey®* 224

Anexo Y - Artigo de Validação da PHI em português publicado na Revista *Medicine (Baltimore)* em Agosto/2016 226

Anexo Z - Artigo de comparação da busca da felicidade entre pacientes com câncer, cuidadores informais e indivíduos saudáveis publicado na Revista Journal of Pain And Symptom Management em Junho/2019 234

LISTA DE FIGURAS

Figure 1 - Discrimination of remembered PHI, experienced PHI, and total PHI scores. These receiver-operating characteristic (ROC) curves plot sensitivity versus 1-specificity for detecting individuals classified as happy: (A) remembered PHI score, (B) total PHI score, (C) experienced PHI score, (D) comparison between PHI scores. The area under the curve (AUC) values with 95% confidence intervals are shown in A–C. In D, experienced PHI (green) has the largest area under the curve compared to the other scores ($P < 0.001$ for both comparisons). 78

Figure 1 - Comparisons of PHI-r, SWLS, and PNES scores between patients with cancer undergoing different phases of disease. PHI-r (A), SWLS (B), PNES-positive (C), and PNES-negative (D) median scores were compared among three groups of patients: survivors (no evidence of disease and no antineoplastic treatment); adjuvant therapy (no evidence of disease but under antineoplastic treatment); and palliative care only (evidence of disease and no antineoplastic treatment). Legend: PHI-r, remembered Pemberton Happiness Index; SWLS, Satisfaction with Life scale; PNES, Diener and Emmons' Positive and Negative Experience Scale 124

Figure 1 - Word clouds generated using participants' statements concerning their pursuit of happiness. a) Healthy population; b) informal caregivers; c) cancer patients; d) cancer patients, survivors; e) cancer patients, adjuvant treatment; f) cancer patients, exclusive palliative care 143

Figure 2 - Graphically description of categories and subcategories based on participants' statements. Categories and subcategories are shown in dark gray circles and light gray circles, respectively. At the center of the figure is the open question of the study ''What is missing for you to be happy?" 144

LISTA DE TABELAS

Introdução

Tabela 1 Instrumentos que avaliam Bem-Estar Subjetivo e Felicidade disponíveis na língua portuguesa (Barretos, HCB, 2019) 45

Artigo 1

Table 1 Pearson correlations for remembered well-being items and the PHI's remembered score (excluding experienced well-being) 71

Table 2 Description of the original English PHI version, synthesized PHI version, and final Portuguese Universal PHI version 72

Table 3 Characteristics of the study participants 74

Table 4 Mean scores and internal consistency values 75

Table 5 Known-group validity 76

Table 6 Cramer's V between satisfaction with the events of the day before and the 10 items on experienced well-being (five negative and five positive) (n=96) 77

Artigo 2

Table 1 Demographic and socio-demographic characteristics of participants (n=2151) 97

Table 2 Multiple linear regression for the evaluation of happiness-related characteristics measured by the Pemberton Happiness Index (PHI-r) (n=2151) 98

Table 3 Logistic regression for the evaluation of happiness-associated characteristics measured by the dichotomized Pemberton Happiness Index (PHI-r) (n=2151) 99

Table 4 Multiple linear regression for the evaluation of characteristics associated with life satisfaction, measured by the Satisfaction with Life Scale (SWLS) (n=2151) 100

Table 5 Decision tree model with simple decision rules (considering the studied variables) to discriminate between the groups and their respective probabilities of being considered happy or unhappy 101

Table 6 Influence of variables on the happiness and satisfaction with life scores 102

Artigo 3

Table 1	Socio-demographic characteristics of participants (n=2580)	119
Table 2	Multiple Linear Regression for evaluation of happiness associated characteristics measured by PHI-r (n=2580)	120
Table 3	Multiple Linear Regression for evaluation of characteristics associated with satisfaction with life, measured by SWLS (n=2580)	121
Table 4	Multiple Linear Regression for evaluation of characteristics associated with positive affects measured by PNES (n=2580)	122
Table 5	Multiple Linear Regression for evaluation of characteristics associated with negative affects measured by PNES (n=2580)	123

Artigo 4

Table 1	Socio-demographic characteristics of study participants (n=2580).	140
Table 2	Frequency of categories and subcategories found in the narrative analysis per group	141
Table 3	Frequency of categories and subcategories found in the analysis of narratives of cancer patients	142

Artigo 5

Tabela 1	Médias de felicidade e satisfação com a vida em função dos Índices de Desenvolvimento Humano (IDH) e Índices de Vulnerabilidade Social (IVS) referentes às cidades em que os participantes residiam	147

LISTA DE ABREVIATURAS

DMCI Diferença Mínima Clinicamente Importante

DUDH Declaração Universal dos Direitos Humanos

EAPN Escala de Afetos Positivos e Negativos

ESV Escala de Satisfação com a Vida

FIB Felicidade Interna Bruta

GPQual Grupo de Pesquisa em Qualidade de Vida e Cuidados Paliativos

HCB Hospital de Câncer de Barretos

HPI *The Happy Planet Index*

IDH Índice de Desenvolvimento Humano

IP Protocolo de Internet (IP, na sigla em inglês)

IQD Índice de Qualidade do Desenvolvimento

IVS Índice de Vulnerabilidade Social

OMS Organização Mundial da Saúde

ONU Organização das Nações Unidas

PHI Índice de Felicidade de Pemberton

PHI-r Índice de Felicidade de Pemberton lembrado

PIB Produto Interno Bruto

QV Qualidade de vida

SDSN Rede de Soluções para o Desenvolvimento Sustentável (SDSN, na sigla em inglês)

RESUMO

INTRODUÇÃO: O número de pesquisas interessadas em descobrir o que é felicidade e o quanto as pessoas são felizes vêm crescendo ao longo dos anos. Uma das afirmações de maior consenso é de que o ser humano está sempre em busca da felicidade, independentemente do modo como ele a entenda. Certos de que a felicidade é um importante ícone vinculado à Qualidade de Vida de qualquer indivíduo, estando ele saudável ou não, acredita-se ser importante estudá-la em nosso contexto**. OBJETIVO:** Mensurar os índices de felicidade, satisfação com a vida, afetos positivos negativos e negativos e identificar características significativamente mais frequentes em pessoas consideradas felizes. **MATERIAIS E MÉTODOS:** Trata-se de um estudo transversal utilizando ferramenta eletrônica e coleta de dados presencial. Os participantes das cinco regiões do Brasil foram recrutados de forma *on-line* por meio da rede social *Facebook* e contatos por *WhatsApp,* onde tiveram a oportunidade de acessar o link do programa *SurveyMonkey®* (tipo de programa disponível na internet que envia questionários de modo *on-line*) e responder aos instrumentos de coleta de dados da pesquisa de forma voluntária. Uma amostra de pacientes com câncer e cuidadores informais de pacientes com câncer foi entrevistada no Hospital de Câncer de Barretos. Foram respondidos três questionários, contendo no total 36 questões sobre bem-estar, felicidade, satisfação com a vida e afetos positivos e negativos; e outro com 31 questões sobre dados sociodemográficos e clínicos e associados potencialmente à sua felicidade. As variáveis quantitativas foram comparadas pelos testes T de *Student* ou ANOVA e as variáveis qualitativas pelo teste do qui-quadrado. Análises de regressão linear e logística foram conduzidas de forma a identificar variáveis associadas com a percepção de felicidade, satisfação com a vida e afetos positivos e negativos. **RESULTADOS:** Foram incluídos 2580 participantes, sendo 2112 (81.9%) representantes da população geral, 342 (13.3%) pacientes oncológicos e 126 (4.9%) cuidadores informais de pacientes oncológicos. Pacientes com câncer, assim como os cuidadores informais, reportam maiores índices de felicidade e satisfação com a vida que as pessoas teoricamente saudáveis, mesmo apresentando menores escores de afetos positivos e maiores escores de afetos negativos. Enquanto pacientes com câncer e cuidadores informais buscam saúde e cura para serem felizes, as pessoas saudáveis da população geral buscam dinheiro, trabalho e melhores relacionamentos interpessoais. Foi possível verificar um conjunto de variáveis que

influenciam positivamente na sensação de felicidade e na satisfação com a vida de participantes da população geral. Estar satisfeito com aspectos financeiros, ter percepção positiva frente à autoavaliação da saúde, ter frequentes reuniões familiares, praticar atividades físicas ≥3 vezes por semana e não ter diagnósticos prévios de problemas psicológicos/psiquiátricos, são variáveis que se associaram positivamente com a percepção de felicidade. **CONCLUSÕES:** Algumas condições estão associadas com as percepções de felicidade e satisfação com a vida na população geral; parte delas é perfeitamente modificável. A forma como os indivíduos buscam a felicidade e como eles a enxergam provavelmente se relaciona com os índices de felicidade que os mesmos reportam. Assim, ter o diagnóstico de câncer ou cuidar de alguém com câncer, pode fazer com que os indivíduos, mesmo reportando mais afetos negativos e menos positivos, estejam mais felizes que as pessoas da população geral, possivelmente por enxergar a felicidade em aspectos distintos, criar novas perspectivas da vida e mudar o nível de expectativas quanto ao futuro.

PALAVRAS-CHAVE: Felicidade; Bem-Estar; Satisfação Pessoal; Inquérito Epidemiológico; Questionários; Brasil.

ABSTRACT

BACKGROUND: The number of researches interested in finding out what happiness is and how happy people are has been growing over the years. One of the most consensus statements is that the human being is always looking for happiness, regardless of how he understands it. Certain that happiness is an important icon linked to the quality of life of any individual, whether healthy or not, is believed to be important to study in our context. **AIM:** To measure happiness, life satisfaction, negative and positive affects, and to identify significantly more frequent characteristics in people considered happy. **MATERIALS AND METHODS:** This is a cross-sectional study using an electronic tool and on-site data collection. Participants from the five regions of Brazil were recruited online through the Facebook social network and contacts via WhatsApp, where they had the opportunity to access the SurveyMonkey® program link (type of program available on the internet that sends questionnaires online) and respond to survey data collection tools on a voluntary basis. A sample of cancer patients and informal caregivers of cancer patients was interviewed at Barretos Cancer Hospital. Three questionnaires were answered, containing a total of 36 questions about well-being, happiness, satisfaction with life and positive and negative affects; and another with 31 questions about sociodemographic and clinical data and potentially associated with their happiness. Quantitative variables were compared by Student's t-test or ANOVA and qualitative variables by chi-square test. Linear regression and logistic analyzes were conducted to identify variables associated with the perception of happiness, satisfaction with life and positive and negative affects. **RESULTS:** A total of 2580 participants were included, 2112 (81.9%) representing the general population, 342 (13.3%) cancer patients and 126 (4.9%) informal caregivers of cancer patients. Cancer patients, as well as informal caregivers, report higher rates of happiness and satisfaction with life than theoretically healthy people, even with lower positive affect scores and higher negative affect scores. While cancer patients and informal caregivers seek health and healing to be happy, healthy people in the general population seek money, work and better interpersonal relationships. It was possible to verify a set of variables that positively influence the feeling of happiness and satisfaction with life of participants of the general population. Being satisfied with financial aspects, having a positive perception regarding self-rated health, having frequent family reunions, practicing physical activities ≥3 times a week, and not having previous diagnoses of psychological/psychiatric problems, were variables that were positively associated with perception of happiness. **CONCLUSIONS:** Some conditions are associated with perceptions of happiness and life satisfaction in the general population; some of them are perfectly modifiable. How individuals seek happiness and how they see it probably relates to the happiness indices they report. Thus, being diagnosed with cancer or caring for someone with cancer can make individuals, even reporting more negative and less positive

affects, happier than people in the general population, possibly seeing happiness in different ways, creating new perspectives on life and changing expectations for the future.

KEYWORDS: Happiness; Well-Being; Personal satisfaction; Epidemiological Survey; Questionnaires; Brazil.

Contextualização

A ideia original deste estudo foi concebida pela Dra Bianca Sakamoto Ribeiro Paiva, que em uma sexta-feira à noite, ao ouvir o jornalista Sérgio Chapelin, no programa Globo Repórter, questionar "O que te faz feliz?", logo pensou que esta poderia também ser uma dúvida do meio científico. A partir de então, uma busca em literatura foi iniciada para identificar estudos que tivessem como foco os fatores que influenciariam na felicidade dos brasileiros. A discussão sobre o tema é antiga e os primeiros filósofos já debatiam o por que de ser feliz e o que de fato tornaria as pessoas mais felizes. Seria importante questionar tudo isso também no cenário brasileiro do século XXI.

Até chegar ao desenho metodológico atual, a ideia desta pesquisa permeou por alguns campos, como o do voluntariado, o de pessoas com a saúde comprometida, o de pessoas saudáveis, o de profissionais de saúde... Contudo, ao final permaneceu a necessidade de se estudar de maneira ampla a população geral, afinal todos os seres humanos, independentemente da sua condição física, emocional, social ou espiritual, estão sempre à procura da tão sonhada e desejada felicidade! E o desenvolvimento deste estudo culminou com o conturbado momento político e financeiro pelo qual o Brasil tem passado. Será que este seria um outro fator que impactaria na felicidade dos brasileiros?

Sendo a felicidade uma importante dimensão da qualidade de vida, tais construtos foram relacionados e inseridos no contexto científico, uma vez que o Grupo de Pesquisa em Cuidados Paliativos e Qualidade de Vida (GPQual) tem desenvolvido diversos estudos relacionados a este tema no Hospital de Câncer de Barretos. Sabe-se que o indivíduo portador de uma doença crônica, como é o caso do paciente oncológico (com diagnóstico atual ou prévio), está vulnerável a conviver constantemente com as limitações físicas, conflitos emocionais e espirituais e dificuldades socioeconômicas decorrentes da doença e do tratamento. Todavia, vários pacientes referem ser felizes mesmo assim. Então, este estudo busca também avaliar ser há alguma mudança na motivação para a felicidade após o diagnóstico oncológico. A felicidade seria algo mais simples e atingível para estas pessoas?

A multidimensionalidade e a subjetividade da felicidade corroboram para que esta tenha aspectos democráticos, possibilitando que tanto pessoas doentes quanto saudáveis, possam desfrutar desta experiência interna que permite usufruir de um estado emocional positivo.

Afinal, como disse o poeta Carlos Drummond de Andrade: “Que ela [a felicidade] possa vir com toda simplicidade, de dentro para fora, de cada um para todos”.

1 INTRODUÇÃO

1.1 Felicidade

1.1.1 Aspectos gerais sobre a felicidade e conceitos

É crescente o número de estudos com o interesse em descobrir o que é a felicidade e os níveis de felicidade das pessoas[1-3]. Uma das afirmações de maior consenso é de que, independentemente do modo como as pessoas entendam a felicidade, o ser humano está sempre em busca dela[4]. As definições são diversas, contudo a maior parte a relaciona com um estado emocional positivo com sentimentos de bem-estar e prazer[5]. Trata-se daquela experiência interna de cada indivíduo que emite um julgamento de como a pessoa se sente e o seu grau de satisfação com a vida[6, 7].

O bem-estar refere-se a aspectos positivos da saúde mental de uma pessoa e é comumente conceituado englobando bem-estar subjetivo (as classificações subjetivas de satisfação com a vida e a experiência de frequentes emoções positivas e poucas emoções negativas) e saúde mental (sintomas pouco frequentes de ansiedade e depressão)[8]. Melhorar o bem-estar é um objetivo social crítico que tem o potencial de gerar consequências positivas inumeráveis. Maiores níveis de bem-estar têm sido associados a vários marcadores de sucesso, incluindo a melhora da saúde física e mental, relações sociais mais positivas, melhor desempenho no local de trabalho e maior renda, o que sugere que a melhoria do bem-estar pode proporcionar direta ou indiretamente maior sucesso em diversos domínios de vida[9].

Durante muitos séculos e em diferentes culturas, acreditava-se que a felicidade dependia do propósito dos deuses[5]. No século IV antes de Cristo, Sócrates acreditava que ser feliz era uma responsabilidade do indivíduo, pregando que a intelectualidade e a filosofia seriam o caminho que levaria a essa condição[1, 5]. Aristóteles, por sua vez, concluiu que atingir outros objetivos almejados pela humanidade (beleza, riqueza, saúde, poder) eram também meios de alcançar a felicidade[5].

No Ocidente, a partir do Iluminismo, se estabeleceu a crença de que todo ser humano tem o direito de atingir a felicidade[5]. Em 1776, a Declaração da Independência dos Estados Unidos, escrita por Thomas Jefferson, declara que “todos os homens têm o direito inalienável de buscar sua felicidade”[1]. É a felicidade ganhando condição equivalente ao direito à vida, à liberdade, à igualdade e à dignidade da pessoa humana[10].

Em 1948, após a Revolução Francesa e as duas guerras mundiais, houve a criação da Organização das Nações Unidas (ONU) e da Declaração Universal dos Direitos Humanos (DUDH), onde os países membros da ONU estabeleceram como ordens jurídicas internas alguns direitos reconhecidos na DUDH, nascendo então os Direitos Fundamentais[10].

Na década de 1980, surgiu o conceito de bem-estar psicológico, referindo-se ao desenvolvimento humano na superação dos desafios existenciais da vida[11]. A partir da década de 1990, estudos sobre felicidade e bem-estar subjetivo ganharam impulso através da chamada Psicologia Positiva[6] , uma nova área que se dedica a investigar os estados afetivos positivos[5], propondo uma mudança de foco da reparação de aspectos negativos e das doenças para a promoção da saúde e dos aspectos positivos do ser humano[6]. O indivíduo deveria procurar atingir um objetivo mais simples e fácil de ser contemplado, o bem-estar. Há ainda afirmações de que a felicidade é só um dos cinco elementos responsáveis pelo bem-estar, os demais seriam o propósito, a realização, o engajamento e as relações pessoais[12].

Estudar o bem-estar subjetivo tem como objetivo principal compreender a avaliação que as pessoas fazem de suas vidas[6, 13] e também como e por que as pessoas experienciam suas vidas positivamente[13].

Em essência, o bem-estar refere-se a contentamento, satisfação ou felicidade derivada de um ótimo funcionamento, que não precisa ser perfeito, visto que é subjetivo e trata-se de um conceito relativo, e não absoluto. As próprias aspirações pessoais são o ponto de referência para o julgamento do bem-estar, e estas são baseadas em uma mistura de realidade objetiva e suas reações subjetivas a ela[14]. No entanto, isso traz desafios para avaliação, visto que as aspirações podem sofrer mudanças ao longo do tempo[15,16], o que revela que, no geral, interpretar julgamentos subjetivos de bem-estar é uma atividade complexa[17]. O bem-estar ainda pode ser avaliado em cada domínio da saúde (físico, emocional, social e espiritual) e a soma destes produz julgamentos da qualidade de vida relacionada à saúde[17].

O bem-estar subjetivo é percebido através de filtros de personalidade e de julgamento cognitivo e emocional e, implica em uma autoavaliação positiva. Logo, um indivíduo com deficiência pode relatar sentimentos de bem-estar emocional. Pode se sentir perfeitamente bem dentro dos limites de sua incapacidade[17]. O objetivo de viver é maximizar a felicidade, ressaltando a tradição hedonista, cujo foco está no bem-estar subjetivo (o prazer e a

satisfação de alcançar os objetivos). Isso envolve dois componentes emocionais: o afeto positivo combinado com a ausência de afeto negativo e, um elemento cognitivo, a satisfação com a vida, que se refere à avaliação subjetiva interna da pessoa sobre sua qualidade de vida geral[18]. Alguns autores consideraram a satisfação com a vida como intimamente relacionada à moral, adaptação e bem-estar psicológico[19] .

Assim como "Felicidade", o termo "Qualidade de Vida" (QV) é muito particular, considerado subjetivo e de difícil definição para muitos autores. Por esse motivo, a Organização Mundial da Saúde (OMS) definiu a QV como "a percepção do indivíduo de sua posição na vida no contexto da cultura e sistema de valores nos quais ele vive e em relação aos seus objetivos, expectativas, padrões e preocupações"[20]. E ainda afirmou que a felicidade é um componente amplamente presumido da QV, sendo este um conceito considerado tão importante para a existência humana que já é reconhecido como um componente integral de saúde[20].

A perspectiva eudaimônica critica o foco exclusivo no prazer. Destaca que o indivíduo deveria aspirar mais que uma vida de mero prazer. Em vez disso, o verdadeiro bem-estar psicológico deriva do crescimento pessoal e da contribuição pessoal ativa[21] . A eudaimonia chama as pessoas a viverem de acordo com seu verdadeiro eu[22]. A perspectiva eudaimônica muda o foco sutilmente do bem-estar subjetivo para o psicológico, enfatizando o crescimento e a adaptação pessoal contínuos[17]. Ambos os construtos, bem-estar subjetivo e bem-estar psicológico, estão presentes quando se aborda a questão da felicidade, colocando em evidência a necessidade de se atender às perspectivas hedônica e eudaimônica[11].

O paradigma hedônico ressalta as emoções prazerosas, satisfação com a vida, bem-estar subjetivo ou felicidade e uma certa ausência de desprazer[23], correspondente à satisfação dos desejos[24]. Já a concepção eudaimônica, compreende o bem-estar sob a perspectiva do funcionamento psicológico global[13], ultrapassa a mera busca ou alcance do prazer[24].

O bem-estar subjetivo se apresenta em duas categorias de teorias distintas: *bottom-up* e *top-down* ou "base-topo" e "topo-base"[23]. As teorias da categoria *bottom-up* procuram perceber a influência dos fatores internos ao indivíduo e as teorias da categoria *top-down* procuram perceber os fatores externos e demográficos na variabilidade do bem-estar subjetivo[11].

Tais teorias surgiram da preocupação em identificar como os fatores externos, as diversas situações e os componentes sócio demográficos poderiam afetar a felicidade. A teoria *bottom-up* sustenta um pressuposto de que existe uma série de necessidades humanas universais e básicas, e que a satisfação ou não destas, viabilizaria a felicidade. As experiências de eventos prazerosos estariam relacionadas aos afetos positivos, assim como eventos não prazerosos associados a afetos negativos. A felicidade estaria relacionada mais à frequência diária, do que à intensidade, dos momentos de afetos positivos versus os negativos[23, 25].

As abordagens *top-down* elucidam como os indivíduos possuem uma predisposição para interpretação de situações e experiências de vida, de forma positiva ou negativa, o que consequentemente influenciaria na avaliação das suas vidas. De forma simples, a pessoa aproveitaria os prazeres porque é feliz e não o contrário. Para a perspectiva *top-down*, a interpretação subjetiva dos eventos é que influenciaria o bem-estar subjetivo, ao invés das próprias circunstâncias objetivas sugeridas pela abordagem *bottom-up*[23].

Algumas definições existentes de felicidade, bem-estar subjetivo e qualidade a vida sugerem sobreposição conceitual entre esses construtos, gerando discordâncias entre alguns autores[26,27]. Resultados de um estudo recente fornecem suporte para o uso intercambiável dos termos felicidade, bem-estar subjetivo e qualidade de vida psicológica e sugerem que esses construtos e domínios de qualidade de vida podem ser considerados como facetas do construto de bem-estar global[26]. Outros estudos ressaltam que a felicidade é, um conceito mais amplo do que a QV, pois vai além da capacidade de fazer as coisas e incorpora a satisfação de realizá-las, ou seja, o gozo da vida como um todo [27, 28,29]. Vale destacar que ainda há uma lacuna na literatura no que tange a estes construtos e suas associações, não havendo um consenso definitivo a este respeito. Logo, o próprio construto felicidade, devido à sua complexidade, já imprime uma limitação ao ser estudado.

Alguns defendem que existem duas dimensões distintas de felicidade: aquela vinculada a um pensamento psicológico egoísta, caracterizada pela percepção de um "eu" permanente, independente e sólido, denominada como felicidade flutuante, e aquela vinculada a um funcionamento psicológico altruísta, quando a percepção do "eu" é flexível e ligada ao ambiente, incluindo demais pessoas, resultando na felicidade autêntica e duradoura. Ainda para o mesmo autor, o indivíduo egocêntrico flutua por fases de prazer e desprazer repetidamente, já aquele indivíduo altruísta, participa de um estado de plenitude

permanente, utilizando de recursos individuais e habilidades para enfrentar os obstáculos da vida[30].

Recentemente, a ONU aprovou uma resolução reconhecendo a busca da felicidade como "um objetivo humano fundamental". Mais do que um anseio individual, a ONU estabelece a importância de criação de políticas públicas com essa finalidade[31]. Órgãos internacionais têm incentivado cada país a elaborar medidas que reflitam suas características, por esse motivo, atualmente, a felicidade tem sido considerada, contemplada ou mesmo já incorporada nas políticas públicas de diversos países.

Atualmente, alguns indicadores já medem o bem-estar, como por exemplo:

- Felicidade Interna Bruta (FIB), criado em 1972, pelo rei do Butão (Jigme Singye Wangchuck), baseado no princípio de que o desenvolvimento social dependeria de fatores espirituais e materiais. A FIB mede a satisfação da população a partir de nove macroitens: níveis de educação, padrão de vida, governança, acesso à saúde, vitalidade comunitária, proteção ambiental, acesso à cultura, gerenciamento do tempo e bem-estar psicológico.
- Índice de Qualidade do Desenvolvimento (IQD) calculado pelo Instituto de Pesquisa Econômica Aplicada (IPEA) que mede o desenvolvimento do país com base no crescimento, qualidade da inserção externa e bem-estar.
- Índice de Gini, criado em 1912 pelo italiano Conrrado Gini, que mensura a desigualdade social de um país pela distância entre os 20% mais ricos e os 20% mais pobres.
- Índice de Desenvolvimento Humano (IDH) que estima a QV dos países levando em conta a renda *per capita*, saúde (expectativa de vida), acesso à educação e questões ambientais.
- Índice de Prosperidade Legatum, divulgado pela Forbes e o Instituto Legatum, faz uma relação anual dos países mais felizes do mundo, considerando os níveis de riqueza, satisfação de vida ou de desenvolvimento dos países.
- Índice do Planeta Feliz, originalmente conhecido como *The Happy Planet Index* (HPI), que mede dados globais de expectativa de vida, bem-estar social e medidas ambientais[32].

Cada vez mais os líderes mundiais estão discutindo sobre a importância do bem-estar como um guia para suas nações e do mundo. É entendido que a aferição e a análise da felicidade sistemática podem contribuir muito com as formas de melhorar o bem-estar no mundo e o desenvolvimento sustentável[33]. Em 1996, um estudo apontou que 65% dos

brasileiros consideravam-se felizes com suas próprias vidas e 43% deles achavam que o Brasil era o país mais feliz do mundo; 10 anos depois, o índice de felicidade subiu para 76%[1]. Apesar disso, o Brasil ainda não está entre os países com maior nível de bem-estar, indicando um potencial para melhorar o planejamento e desenvolvimento de políticas públicas voltadas a este propósito[34].

A Rede de Soluções para o Desenvolvimento Sustentável (SDSN, na sigla em inglês), vinculado à ONU, divulga, desde 2013, o *ranking* global de felicidade, denominado *World Happiness Report*. O SDSN é composto por representantes do meio acadêmico, de governos e do setor privado. Este ranking tem como base o quanto as pessoas se consideram felizes, todavia estima também o quanto dessa felicidade é influenciado pelo PIB (Produto Interno Bruto) per capita, políticas públicas, expectativa de vida, generosidade, níveis de corrupção e liberdades individuais [35,36].

Em 2018 e 2019, a Finlândia foi considerado o país mais feliz do mundo dentre um total de 156, seguido pela Noruega em 2018 e pela Dinamarca em 2019. O Brasil, que ocupava a 22° posição no *World Happiness Report* em 2017, na edição de 2018, recuou 6 posições, ficando em 28° lugar, e ocupou a 32° posição em 2019, com pontuação 6.3, em uma escala de 0 a 10. Essa é a pior posição do país desde o início do estudo em 2013, quando ficara em 24° lugar. A melhor foi registrada em 2014, quando ocupou o 17° lugar[36, 37].

Diante de tudo isso, é possível afirmar que a felicidade tem sido um tema corriqueiro e difundido na mídia. Os indicadores de felicidade dos brasileiros têm sido comparados aos de outros países com níveis melhores ou mesmo piores, chamando atenção assim não só da população em geral, mas também de governantes responsáveis pelas políticas públicas.

1.1.2 Felicidade e atividades de psicologia positiva

Diversas pesquisas têm sido realizadas a fim de relacionar os determinantes do bem-estar com vivências pessoais. Nesse sentido, estudos conduzidos nos últimos anos evidenciaram forte relação entre experiências positivas ou negativas do indivíduo com seu estado de saúde físico e mental. Assim, construções emocionais demonstram as diferentes maneiras que uma pessoa reage frente a eventos estressantes e ruins, de maneira a atuar sobre a saúde física do indivíduo[38, 39].

Estudos apontam a noção de que é a quantidade de tempo que as pessoas experimentam afetos positivos que define a felicidade, não necessariamente a intensidade desse afeto. Pessoas mais felizes costumam experimentar emoções positivas a maior parte do tempo, o que identifica os indivíduos felizes como aqueles que experimentam altos níveis médios de afetos positivos[9].

Quando se trata da busca da felicidade, a cultura popular incentiva um foco em si mesmo. Por outro lado, evidências científicas sugerem que o comportamento pró-social (atos de bondade para os outros ou para o mundo) tem maior influência na felicidade do que o comportamento autocentrado (atos de bondade para si mesmo)[40].

Um número crescente de estudos realizados ao longo da última década tem demonstrado a eficácia de técnicas que visam o aumento do bem-estar através de intervenções em estudos randomizados controlados que estimularam as pessoas a redigir cartas de gratidão, relembrar memórias felizes e praticar atos de bondade regularmente. Em uma meta-análise, foi descrito que a aplicação de tais técnicas levou a aumento na felicidade e diminuições pequenas a moderadas de sintomas depressivos. É plausível dizer que os pesquisadores estão no caminho para criar uma ciência capaz de aumentar a felicidade[41].

Atividades positivas são tipicamente breves, simples, acessíveis e requerem pouco ou nenhum recurso financeiro, além de poderem proteger contra psicopatologias[42]. Geralmente, os procedimentos experimentais típicos que ocorrem em estudos randomizados de intervenção de Psicologia Positiva ditam quando, por quanto tempo e com que frequência o participante deve se envolver em uma atividade especial para a felicidade ao longo de um número predeterminado de dias ou semanas[41]. Um exemplo seria um estudo que identificou que os participantes que realizaram cinco atos de bondade em um único dia da semana apresentaram aumento na felicidade autorrelatada, mas aqueles que realizaram cinco atos de bondade ao longo da semana não relataram[43].

A literatura sugere que o desenvolvimento do bem-estar precoce atua como fator protetor contra fatores de risco para desordens mentais, o que seria motivo para estimulação de práticas de atividades positivas (que promovem um maior bem-estar) por crianças, adolescentes e adultos, com a finalidade de benefícios diretos e indiretos à saúde mental[42].

Em estudo realizado com o objetivo de avaliar a viabilidade e aceitação de nove atividades de Psicologia Positiva entregues a pacientes hospitalizados por pensamentos ou

comportamentos suicidas, concluiu que tais exercícios eram viáveis e foram associados a resultados clinicamente relevantes em curto prazo. As atividades foram bem aceitas e algumas específicas, especialmente aquelas relacionadas à gratidão e que utilizavam fortes pontos pessoais pareciam ser mais eficazes neste contexto. Estes pontos fortes eram escolhidos pelos próprios participantes, como por exemplo, humildade e perseverança. Estes exercícios diretos, que não exigiam introspecção substancial, tendiam ter melhor desempenho. Medidas como otimismo e desesperança foram melhoradas após a realização das atividades[44].

Algumas categorias de estratégias que tendem a influenciar, de forma positiva, a felicidade das pessoas já foram descritas: prática de atos de bondade para com outras pessoas; busca de objetivos que sejam importantes; expressão de gratidão; otimismo; prática de exercício físico ou esporte; estímulo a ter relacionamentos sociais; saborear alegrias da vida; agir como uma pessoa feliz; realização de atividades que fazem a pessoa sentir "o momento"; prática do perdão; prática de espiritualidade e/ou religiosidade; utilização de estratégias que ajude lidar com estresse ou adversidade; evitar comparações com outras pessoas; prática de meditação[45].

Uma meta-análise de 51 intervenções a partir de atividades positivas indicou melhorias significativas no bem-estar e atenuação dos sintomas depressivos[41, 46]. Estudos randomizados de intervenção têm revelado que duas atividades positivas principais podem influenciar no aumento da felicidade: atos de bondade e expressão de gratidão[3, 47].

Quando os participantes de estudos de intervenção que visam aumento da felicidade têm a opção de escolher as atividades a serem praticadas, eles tendem a escolher estratégias que se aproximam das categorias de "atos de bondade" e "expressão de gratidão"[48]. Contudo, em uma amostra de 2928 “requerentes à felicidade”, que utilizaram um aplicativo de celular para praticar atividades de promoção de felicidade, dentre oito opções de categorias, as mais escolhidas foram “avaliação e busca de objetivos” (31%) e “saborear alegrias da vida” (22%), sendo que "atos de bondade" e "expressão de gratidão" foram as opções menos escolhidas (2,7% e 3,1%, respectivamente). Tais resultados sugerem que aquelas pessoas que buscam de forma espontânea seguir atividades a fim de aumentar sua felicidade pode preferir agir de forma diferente daqueles que são recrutados para pesquisas[48].

Para que a busca pela felicidade seja alcançada são necessárias duas condições: as pessoas precisam tanto uma "vontade" (ou seja, o desejo e motivação para se tornar mais feliz) e um "caminho" (ou seja, uma atividade de aumento de felicidade eficaz ou prática positiva)[3]. Todavia, é importante alertar contra a suposição de que todos os indivíduos têm a mesma vontade de aumentar o bem-estar pessoal e que todos os indivíduos se beneficiariam da mesma maneira ao buscá-lo, até porque embora a maioria dos indivíduos que busca a felicidade se beneficia praticando regularmente estratégias de busca, esses benefícios podem ser mitigados por normas culturais e valores que deixam de apoiar tais esforços[49].

Apesar de haver em literatura um número substancial de estudos sobre a eficácia da prática de atividades com a finalidade de aumentar a felicidade, pouca discussão centrou-se sobre a quem estes exercícios se destinam exatamente. Além disso, os pesquisadores sabem muito pouco sobre o que os membros de seu público-alvo (ou seja, "buscadores da felicidade") estão fazendo por conta própria, antes de serem participantes na investigação[48].

A motivação para tornar-se mais feliz é fundamental para os resultados das atividades de bem-estar positivo. Uma possível explicação é que as estratégias de aumento da felicidade, simplesmente não são tão significativas ou úteis para pessoas que não estejam motivadas para a prática destas atividades. Isto porque possivelmente estes indivíduos já estejam relativamente bem ajustados e, portanto, não têm tanto a ganhar por se envolverem em tais atividades[3].

Evidências mostram que, ao longo do tempo, as pessoas tendem a se adaptar ao impacto emocional de estímulos positivos e negativos[50, 51]. Pesquisas sobre eventos positivos, tais como casar-se[52] ou ganhar uma promoção no emprego[53], sugerem um padrão geral de adaptação hedonista, de tal forma que as pessoas experimentam um aumento na felicidade no início da mudança positiva, seguido de um eventual retorno ao seu nível basal original de felicidade, como se eles se acostumassem com a mudança.

Três oncologistas, em um artigo científico[54], citaram alguns itens que contribuiriam para o aumento da felicidade, os quais contextualizaram como os "*Hallmarks of Happiness*". Tais itens seriam: reflexão ou propósito (ter um tempo para simplesmente refletir, e considerar a incorporação de uma prática de *mindfulness*); crescimento (tentar fazer algo diferente da sua área de atuação, permitir que sua mente cresça com estímulos diferentes);

prática de exercícios físicos (melhorar o condicionamento físico); descansar (ter intervalos regulares durante o dia de trabalho, hábitos regulares de sono, desfrutar de férias); serviço ou altruísmo (práticas de serviços com espírito entusiástico para colegas e familiares); gratidão (ter momentos no início e no final de cada dia para refletir sobre a sorte, ser grato pelas conquistas já alcançadas); conexão (aceitar a ajuda dos outros, delegar atividades, conhecer pessoas e lugares diversos, fora do círculo de trabalho); abraçar a incerteza (aprender a ser flexível, preparar e planejar um futuro além da vida profissional).

Além disso, ao contrário de muitas circunstâncias de vida e experiências a que se adapta muito rapidamente (por exemplo, mudar para uma desejável nova casa, escritório ou cidade), a prática de atividades positivas volitivas pode servir como um antídoto natural para o processo de adaptação hedônica[51]. Ou seja, essas atividades, quando praticadas usando o calendário e em uma variação ótima[55], pode fornecer impulsos duradouros no bem-estar que não se apagam inteiramente com a passagem do tempo.

1.1.3 Felicidade e condições associadas

Estudos que analisaram a influência da personalidade de pessoas quanto ao grau de felicidade trouxeram resultados em que, indivíduos com perfis extrovertidos e elevada autoestima caracterizam maior grau de afeto positivo, ao contrário de pessoas nervosas e depressivas[5]. Quanto mais uma pessoa apresenta afetos positivos, menores devem ser os seus afetos negativos, no entanto, um indivíduo não apresenta nível nulo de afetos, pois um não extingue a existência do outro. Sendo assim, acredita-se que para uma pessoa ser feliz os afetos positivos devem se sobrepor aos negativos[6]. Diversos estudos procuram relacionar índices de felicidade e bem-estar a determinadas características físicas, socioeconômicas ou psicológicas dos indivíduos, mas para alguns autores o bem-estar subjetivo é melhor explicado por modelos integrativos que incluem aspectos da personalidade e também das circunstâncias da vida[56].

Há evidências crescentes que sugerem que diversos processos cognitivos e motivacionais têm influências nas diferenças individuais de felicidade. Um comportamento que está associado à (in)felicidade é a autorreflexão. Os indivíduos infelizes estariam fortemente inclinados a autorreflexões, sendo relativamente mais sensíveis às informações processadas, como problemas nos seus desempenhos quando comparados às outras pessoas ou resultados das suas decisões pessoais, e que esse comportamento teria uma

variedade de consequências adversas. Indivíduos menos felizes parecem sentir e reagir a eventos e circunstâncias de forma relativamente menos positivos e menos adaptáveis, que parecem apoiar a sua infelicidade e autorreflexões negativas[45, 57, 58].

Estudo investigou a implicação da autoafirmação em resultados positivos para o bem-estar psicológico. A autoafirmação é a revisão do Ego de forma cognitiva e emocional, seguida posteriormente pelo julgamento feito pela própria pessoa sobre si mesma (Eu Pessoal) e sobre capacidade de adaptação às expectativas externas (Eu Social)[59]. Os participantes sul-coreanos e norte-americanos realizaram atividades de autoafirmação durante 2 e 4 semanas, respectivamente. As intervenções demonstraram que a autoafirmação promoveu o aumento do bem-estar nas duas populações. Contudo, na população da Coréia do Sul houve melhora do bem-estar eudaimônico, enquanto na norte-americana houve melhora do bem-estar eudaimônico e hedônico[60]. Tais resultados poderiam ser justificados pelas diferenças culturais e conceitos de bem-estar em sociedades ocidentais e orientais. A população asiática, ao realizar as atividades de autoafirmação, pode ter considerado seus valores através de uma lente positiva e também negativa, enquanto a população norte-americana provavelmente incidiu seus valores somente sobre os aspectos positivos de seus valores[60, 61].

Psicólogos da Universidade de Edimburgo e do Instituto *Queensland*, em investigação médica na Austrália, descobriram que a felicidade é parcialmente determinada por traços de personalidade que são em grande parte hereditária. Embora a felicidade esteja sujeita a uma ampla gama de influências externas (saúde, emprego, renda, educação, família, participação social, habitação, ambiente, transportes, segurança, lazer, satisfação com a vida, entre outros) verificou-se que há componentes hereditários que podem ser explicados pela arquitetura genética de personalidade[62, 63]. Embora somente aspectos genéticos não garantam a felicidade, traços da personalidade poderiam influenciar como gatilho positivo quando coisas ruins acontecem, permitindo que algumas pessoas tenham um "reserva" de felicidade[63].

O bem-estar subjetivo é influenciado tanto por componentes genéticos (30-50%) como por fatores ambientais[64]. Devido à forte influência genética no bem-estar, alguns estudos buscam identificar as implicações na concepção e eficácia das intervenções que se destinam a melhorar o bem-estar, pois até mesmo traços 100% hereditários podem ser modificados por intervenções ambientais adequadas[65].

Diante da informação de que o componente genético tem grande influência no bem-estar, poderia se pensar que a busca pela felicidade seria difícil e que os esforços para aumentá-la seriam de certa forma inúteis devido à hereditariedade; contudo, influências genéticas sobre construtos psicológicos complexos não são deterministas e prejudiciais [43, 66]. Isso porque a proporção da variância explicada pelas influências genéticas e ambientais refere-se a estatísticas em nível de população, não para características de nível individual. Quando uma característica é descrita como 50% hereditária, isto não quer dizer que 50% da pontuação de um indivíduo é devido a seus genes e o resto é devido ao ambiente. Pelo contrário, a estimativa indica que 50% dessas diferenças entre as pessoas são devidas a diferenças genéticas entre elas e que as influências genéticas (e ambientais) em construções complexas não são deterministas e as proporções de variância representam risco probabilístico. É possível ter variantes genéticas que conferem risco para um resultado específico, mas não alcançar efetivamente aquele resultado, assim como é possível expor-se a ambientes positivos ou negativos, mas não responder (ser influenciado) por eles[65].

Embora os genes e traços de personalidade possam operar para manter os níveis de felicidade relativamente constantes ao longo do tempo, e embora os indivíduos possam estar predispostos a se adaptarem às experiências de vida positivas de forma relativamente rápida, engajar-se em atividades que aumentam a felicidade (como se comprometer com objetivos importantes, praticando meditação, sendo gentil com os outros, pensando de forma otimista ou expressando gratidão) têm o potencial de melhorar os níveis de felicidade por períodos significativos de tempo [43, 67].

Em uma intervenção inglesa com 750 gêmeos, um grupo formado por um dos gêmeos praticou atos de bondade e gratidão por 10 semanas e investigou o papel dos genes e do ambiente na criação das diferenças individuais na resposta à intervenção. Os resultados desde estudo mostraram melhorias significativas no bem-estar em resposta às atividades de intervenção. Foi destacado o valor de explorar as inovações em influências ambientais que poderiam fornecer pistas sobre os mecanismos por trás das melhorias do bem-estar. Os resultados também enfatizaram que mesmo traços fortemente influenciados pela genética, como o bem-estar, estão sujeitas a alterações em resposta a intervenções ambientais[65].

Em estudo dinamarquês com indivíduos maiores de 45 anos, identificaram que, apesar de haver diminuição das funções físicas e mentais com o aumento da idade, tais fatores não afetaram a felicidade de forma significativa[68]. Todavia, populações da ex-União Soviética e

da Europa Oriental mostraram importante redução progressiva do bem-estar com a idade, assim como indivíduos da América Latina, enquanto o bem-estar na África Sub-Saariana revelou pouca variação com a idade[69]. Contudo, para outros autores, variáveis situacionais não exercem influência significativa em relação ao sentimento de bem-estar. As emoções são mais bem reguladas à medida que as pessoas ficam mais velhas, proporcionando maior sentimento de bem-estar, quando comparados às pessoas mais jovens[70]. Há quem afirme que os índices de felicidade costumam ser relativamente estáveis ao longo da vida de cada indivíduo, dependendo menos de fatores externos do que se imagina[5].

De acordo com a literatura, pessoas casadas de ambos os gêneros relataram mais felicidade do que aquelas que não possuem uma relação estável, no entanto, não houve associação entre o bem-estar subjetivo e a satisfação conjugal, reforçando o fato que a avaliação da satisfação com a vida é realmente subjetiva, pois cada indivíduo tem o seu próprio critério de contentamento. Em relação a este achado, os autores afirmam que as pessoas que experimentam emoções positivas tendem a se engajar em relacionamentos mais satisfatórios[6]. Outros autores também não encontraram diferenças significativas de bem-estar quando comparados os gêneros feminino e masculino[69].

O dito popular diz que “dinheiro não traz felicidade”. Em suas análises, um estudo constatou que pessoas ricas são mais felizes se comparadas à população em geral. Contudo, os autores afirmam que a felicidade depende de como cada pessoa emprega seu dinheiro, podendo aumentar ou diminuir o nível de bem-estar. Dessa forma, o bem-estar subjetivo não está necessariamente atrelado à riqueza[71]. Muitas pessoas acreditam que seriam mais felizes se tivessem mais dinheiro[72], no entanto, ao longo prazo, isso praticamente não afeta a felicidade. Mesmo nas favelas de Calcutá, as pessoas "são mais satisfeitas do que se poderia esperar"[62, 73]. Riqueza é como a saúde: sua ausência absoluta pode produzir miséria, tendo ainda, não é garantia de felicidade.

Um estudo transversal nos EUA, em uma população de 12.291 indivíduos, revelou que uma renda maior está associada à menor sensação de tristeza diariamente, mas não necessariamente a aumento da felicidade diária. Tais resultados apontaram para a possibilidade de que o dinheiro poderia ser uma ferramenta mais eficaz para reduzir a tristeza do que aumentar da felicidade[74].

Um outro estudo, com clientes de um grande banco nacional do Reino Unido, recrutou por *e-mail* 585 participantes (dentre 150.000 convidados aleatoriamente) a fim de realizar

um inquérito sobre atitudes e comportamentos financeiros e satisfação com a vida. Em seus resultados, a riqueza líquida (valor que os clientes tinham em conta corrente ou poupança) foi positivamente correlacionada com bem-estar financeiro e satisfação com a vida. Além disso, a associação direta entre a riqueza líquida e a satisfação com a vida permaneceu significativa mesmo após em uma regressão múltipla com ajustes para outras variáveis financeiras, idade emprego e *status* de relacionamento. Tais resultados sugerem que ter uma reserva de dinheiro disponível em conta corrente e poupança confere uma sensação de segurança financeira, que por sua vez está associado à maior satisfação com a vida. Este achado sugere que as pessoas com baixo saldo líquido em conta podem sentir-se mais angustiadas economicamente e, portanto, menos satisfeitas com suas vidas, mesmo que os seus rendimentos e gastos, considerados separadamente dos saldos de conta, pudessem prever alta segurança financeira[75].

Os autores comentam que, enquanto muitas pessoas acreditam que o aumento da renda ou riqueza total irá aumentar a felicidade, eles também podem se beneficiar com a construção de uma reserva financeira em suas contas correntes e de poupança. No estudo, esta reserva foi associada com a melhoria do bem-estar independentemente de quanto uma pessoa ganha, investe ou deve. Entende-se que políticas públicas poderiam ter o objetivo de maximizar o bem-estar psicológico da população, incentivando poupança individual (por exemplo, através do aumento de juros taxas) quando economicamente viável, ou encorajando produtos financeiros que incentivem uma reserva de dinheiro em forma líquida e acessível[75].

A questão entre paternidade e felicidade é altamente complexa e influenciada por diversas variáveis importantes. Diversos estudos indicam que aquelas pessoas que têm filhos apresentam maior bem-estar em relação àqueles que não têm filhos, enquanto outros sugerem o contrário. Alguns fatores devem ser considerados por apresentarem influências nestes resultados e na vida dos pais: propósito e significado de vida, emoções positivas e negativas, distúrbios de sono e fadiga, relação matrimonial, dificuldades financeiras, fatores demográficos (idade dos pais, idade das crianças, gênero dos pais, estado civil, status socioeconômico, situação de emprego, estrutura familiar, residência dos pais e dos filhos, cultura) e fatores psicológicos (suporte social, estilo da relação familiar, problemas relacionados à criança, temperamento da criança, apego dos pais)[76].

Evidências revelam que pessoas com filhos, em comparação com aqueles que não tem, apresentam relativamente maior bem-estar quando indivíduos do sexo masculino e de meia-idade e com menor bem-estar quando mulheres jovens e solteiras[77]. Em outra pesquisa, que revisou três estudos com metodologias distintas, os resultados indicam que, contrariamente aos relatórios anteriores, aqueles que têm filhos (e especialmente os pais) apresentaram níveis relativamente mais elevados de felicidade, emoção positiva e significado de vida do que aqueles que não têm filhos. Contudo, as afirmações a respeito da influência da paternidade na felicidade das pessoas, ainda são inconclusivas[78].

Em uma revisão de literatura, foi identificado que aqueles indivíduos com filhos apresentam menores índices de bem-estar à medida que encontram maiores emoções negativas, problemas financeiros, perturbações de sono e problemas no casamento. Por outro lado, quando os pais experienciam maior significado na vida, satisfação das suas necessidades básicas, maiores emoções positivas, e papéis sociais reforçados, eles encontram maiores índices de felicidade e alegria[76].

Entender o efeito causal da paternidade em relação à felicidade permanece ainda sendo uma questão em aberto e bastante complexa, que requer vários estudos e com diversas metodologias, não comparando apenas pais e "não pais", mas examinando as experiências dos pais durante a transição para a paternidade e as suas experiências com e sem seus filhos[77].

Revisões sistemáticas revelam que crenças e práticas religiosas estão relacionadas com maior felicidade, satisfação com a vida e afeto positivo[79]. Em uma revisão de 100 estudos buscando correlação entre religiosidade e bem-estar subjetivo, em 79 deles foram encontradas pelo menos uma relação positiva entre a religiosidade e a satisfação com a vida, salientando que, esta relação positiva tende a ser encontrada em diferentes países, englobando diversas religiões, culturas e idades[80]. Em uma amostra de mais de 20 mil indivíduos (Alemanha, Suíça e Áustria), foram avaliadas a satisfação com a vida e a felicidade de pessoas religiosas e não-religiosas. Aquelas com uma afiliação religiosa e que praticavam a sua religião se mostraram mais satisfeitas com sua vida e apresentaram maiores índices de felicidade do que aquelas que não praticavam sua religião e que eram não-religiosas[81].

A felicidade, embora seja subjetiva, pode ser mensurada, avaliada, correlacionada com funções cerebrais e relacionada às características do indivíduo, da sociedade e do ambiente. Diversas informações importantes sobre a sociedade são reveladas a partir de perguntas

realizadas à sua população sobre seus índices de felicidade ou o quanto estão satisfeitas com suas vidas. Pode indicar crises e sugerir a necessidade de mudança[33].

Apesar de diversos estudos buscarem entender o que, de fato, tem influência nos índices de felicidade das populações, nenhum procurou avaliar, se há relação entre a felicidade e as condições socioculturais da população brasileira (sendo ela saudável ou não). Uma vez que no Brasil tais características não foram avaliadas, tal lacuna permanece na literatura científica.

1.1.4 Felicidade e a relação com saúde e qualidade de vida

Observam-se que determinados níveis de felicidade e bem-estar podem influenciar alguns aspectos relacionados ao indivíduo como relacionamento interpessoal e afetivo, satisfação com a vida, entusiasmo e saúde. Porém, compreendendo que a felicidade e o bem-estar são experiências complexas e multidimensionais, é importante que profissionais da saúde se esforcem para atender às necessidades do ser humano em todas as dimensões da vida: física, psicológica, social, emocional e espiritual[82].

A diminuição de sentimentos negativos pode beneficiar as pessoas, considerando que o aumento da susceptibilidade a doenças e uma diminuição da atividade imunológica podem estar relacionados a estados emocionais desfavoráveis[83]. Por consequência, o afeto positivo está associado à redução de doenças físicas, favorecendo o sistema biológico do indivíduo[84]. A diminuição do estresse reduz os níveis de cortisol, que por sua vez está relacionado a patologias como obesidade, diabetes tipo 2, hipertensão e doenças autoimunes[84]. O estado de saúde é um importante fator relacionado com o bem-estar, portanto, as estratégias para melhorar a saúde da população também teriam implicações no seu o bem-estar[85]. Diante disso, é desejável que as investigações colaborem com dados consistentes sobre o bem-estar subjetivo, contribuindo com ações na promoção de saúde. Dessa forma, o profissional da área poderá utilizá-las em sua prática diária[6, 86].

Os estados emocionais positivos têm uma influência direta e favorável à saúde física[6]. Estudos prévios mostraram que manter o pensamento positivo é crucial, pois ajuda a pessoa a lidar com o sofrimento causado por uma doença, restaurando o sentido da vida e a encontrar um propósito para continuar[87-89].

Aliado a isso, a Organização Mundial da Saúde (OMS) define saúde não apenas como a ausência de doença, mas como a situação de perfeito bem-estar físico, mental, social e

espiritual. Adicionalmente, a saúde é um estado de razoável harmonia entre o sujeito e a sua própria realidade[90]. A melhoria da QV torna-se cada vez mais importante no contexto das práticas assistenciais e também para as políticas públicas de saúde[91]. A melhoria da QV é um dos resultados clínicos mais esperados e é o objetivo de qualquer tratamento que se proponha realizar[92]. Em complemento, "a compreensão das necessidades humanas, materiais e espirituais, focando no conceito de promoção de saúde como ponto mais relevante..."[93] é fundamental para a QV dos pacientes..

Desde a década de 1960, estudos científicos vêm demonstrando que uma vida emocional saudável e criativa constitui como fator de proteção contra doença e desempenha um importante papel na evolução favorável de doenças crônicas, como por exemplo, o câncer[94]. Na atualidade, o câncer é uma das doenças mais temidas pela sociedade. Assim, é importante que os profissionais de saúde auxiliem os pacientes a enfrentarem os medos relacionados aos tratamentos, tenham disponibilidade para ouvir, responder, prover estrutura de suporte e referenciar a demais profissionais mais especializados, quando necessário. Atitudes simples como rezar com a pessoa doente, realizar o toque terapêutico, ouvir ou mesmo orientar a família do indivíduo doente, é também importante, para reduzir o sofrimento do paciente, promovendo sua felicidade e bem-estar[82].

O impacto do percentual crescente de indivíduos acometidos pelo câncer significa um número maior de pessoas enfrentando uma doença crônica e progressiva, que necessitam integralmente de cuidados globais, abordando tanto a saúde física quanto a emocional, contribuindo assim para um melhor enfrentamento durante a fase de doença e até em momentos posteriores[95, 96]. Portadores de câncer, embora apresentem angustiantes sintomas associados à progressão da doença, relatam também estados emocionais positivos, o que é retratado, por exemplo, por sensações de amor, carinho, afeição, segurança, atos de bondade, significado de vida, vínculos familiares, conexões espirituais e sociais, o que contribui para um potencial considerável de aumento das sensações de bem-estar e felicidade. É importante ressaltar que a influência cultural tem importante papel no entendimento dos indivíduos sobre sua felicidade[97-99].

Embora o câncer seja uma doença ameaçadora, pacientes oncológicos muitas vezes consideram-se bastante felizes e têm uma visão otimista em relação ao futuro[82]. Alguns pacientes tendem a focar mais nas experiências passadas positivas, etapa fundamental no

processo de adaptação da nova condição[100]. A importância de se prover cuidados de um modo holístico, a crença religiosa e informações sobre a condição de saúde do paciente são mecanismos importantes para ajudar o mesmo a lidar com o sofrimento causado pela doença[82], o que provavelmente impacta positivamente em sua felicidade e QV.

A investigação de emoções positivas auxilia a compreender o panorama das emoções humanas. Tais emoções são apontadas também pela "Hierarquia de Necessidades de Maslow", também conhecida como "Pirâmide ou Teoria de Maslow", que trata de uma divisão hierárquica em que as necessidades de nível mais baixo devem ser satisfeitas antes daquelas de nível mais alto, para que seja atingida a autorrealização. Tal hierarquia estipula que as necessidades de ordem superior, que incluem a autoestima e autorrealização, estão subordinadas à satisfação das necessidades de ordem inferior, associados às necessidades fisiológicas, de segurança e sociais. Diante disso, pacientes oncológicos deveriam ser assistidos com a finalidade de se conseguir a promoção destas necessidades, tendo como foco tal hierarquia, promovendo então um atendimento holístico e individual[101-104]. A felicidade e a satisfação com a vida são mutuamente inter-relacionados e estão intimamente ligadas à QV, o que as tornam indicadores importantes para se avaliar objetivamente este construto[105].

Certos de que a felicidade é um importante ícone vinculado à QV de qualquer indivíduo, estando ele saudável ou não, ressalta-se a importância de estudá-la. A felicidade e a satisfação com a vida têm forte conexão com QV e plenitude[106]. Há associações significativas entre a felicidade e a saúde[34]. Desta forma, a satisfação em viver e o *status* atual de saúde são fortemente correlacionados entre si[107].

O conceito de uma "boa" QV tem se emaranhado com os termos bem-estar, satisfação com a vida e felicidade. Diversas pesquisas tem abordado essas temáticas na atualidade, no entanto, o número de estudos que focam os estados emocionais negativos é consideravelmente maior, o que traz então a necessidade de se explorar as emoções positivas como a felicidade[105, 108].

As alterações físicas, psíquicas e sociais provocadas pelo tratamento de uma doença grave podem ser quantificadas através de instrumentos ou escalas que avaliam a QV. Essas medidas podem servir como indicadores no planejamento terapêutico e criar métodos, definindo ações no sentido de promover saúde individual ou coletiva[109]. Para isso, uma forma de se avaliar a felicidade de maneira objetiva é por meio da utilização de

instrumentos ou escalas validadas, que possibilitam escores que indicam os níveis de felicidade.

1.2 Instrumentos para avaliação da Felicidade

Felicidade é tipicamente mensurada através do autorrelato[110]. Nos últimos anos, especialmente no universo acadêmico, foram publicados diversos estudos que procuraram delinear mais adequadamente o tema "felicidade", torná-la mais compreensível e, inclusive, mensurável, para que, de certa forma, se torne previsível[4]. Entretanto, estudos sobre felicidade a medem através de diferentes escalas, produzindo números distintos[110], por esse motivo, existe hoje uma necessidade de desenvolvimento de instrumentos nacionais contextualizados, além do aprofundamento dos estudos sobre validação de instrumentos internacionais[7]. A **Tabela 1** apresenta instrumentos utilizados por alguns autores para medir felicidade e bem-estar.

Tabela 1 - Instrumentos que avaliam Bem-Estar Subjetivo e Felicidade disponíveis na língua portuguesa (Barretos, HCB, 2019).

Ano	Autores	Nome do Instrumento	Sigla do Instrumento	Objetivo do Instrumento	Número de Itens	Especificações dos Itens
1999	Lyubomirsky e Lepper, 1999[111]	Subjective Happiness Scale	SHS	Mede a felicidade subjetiva	4 itens	Cada item varia de 1 = nenhum a 7 = muitissimo. O resultado varia de 4 a 28, quanto maior a numeração, mais feliz é o indivíduo
2010	Bourne et al., 2010[107]	Happiness	-	Mede a felicidade	1 item	Medido através da resposta do indivíduo sobre a sua felicidade, escala tipo Likert que varia entre: sempre feliz e raramente feliz
2011	Bruno et al., 2011[112]	Anamnestic Comparative Self-Assessment	ACSA	Mede bem estar subjetivo global	-	O bem estar subjetivo foi avaliado pela escala que varia entre +5 (tão bem quanto o melhor período...) e -5 (tão ruim quanto o pior período...). Participantes também responderam sobre a presença de sintomas de depressão (sim/não); dor e

						ansiedade (nenhuma, moderada, extrema) e aspectos de fim-de-vida: pensamento suicida (nunca, as vezes, frequentemente); ressucitação em caso de parada cardíaca (sim/não) e eutanasia (enfrenta/não enfrenta)
2011	Veronese et al., 2012[113]	Life Satisfaction Scale or Face Scale	FS	Mede a satisfação com a vida	1 item	Escala de avaliação que consiste em 7 faces representando o máximo e o mínimo da satisfação
2012	Dambrun et al., 2012[30]	Subjective Authentic-Durable Happiness Scale	SA-DHS	Mede a felicidade autentica e duradoura	13 itens	Escala de 7 pontos que varia entre 1 = muito baixo e 7 = muito alto. Quanto maior a pontuação, maior a felicidade duradoura
2012	Tessier et al., 2012[114]	Subjective Well-Being	SWB	Mede a felicidade e a satisfação com a vida	1 escala para cada	Quão felizes estão no momento? 0 = corresponde a totalmente infeliz e 10 = corresponde totalmente feliz. Satisfação com a vida nas 4 últimas semanas variou: de 0 = nunca a 10 = sempre
2013	Feicht et al., 2013[106]	Visual Analog Scale	VAS	Mede a felicidade e a satisfação com a vida	1 escala para cada	O quão você está feliz agora? O quão satisfeito você está agora? Escala de avaliação de 6 pontos, com um rosto triste a esquerda e um rosto feliz a direita
2013	Freire et al., 2013[115]	Eudaimonic and Hedonic Happiness Investigation	EHHI	Avalia os componentes hedónico e eudaimónico da felicidade	8 itens (6 de resposta aberta e 2 escalas de resposta Likert)	As abertas referem-se aos construtos da felicidade e do significado. As questões com escala Likert medem os níveis da felicidade e os níveis de significado em 11 domínios de vida: trabalho, família, nível de vida, relações interpessoais, saúde, crescimento pessoal, lazer/tempo livre, espiritualidade/religião, comunidade, sociedade e vida em geral

2013	Hervás e Vázquez, 2013 [116]	The Pemberton Happiness Index	PHI	Mede o índice de felicidade	21 itens	Os 21 itens da escala variam de 0 = discordo completamente a 10 = concordo completamente. 11 itens são relacionados a diferentes domínios referentes a lembrança de bem estar e 10 são relacionados ao bem estar vivido
2013	Pinto et al., 2013 ([117])	Adaptado do Permanent Survey on Social Attitudes of the Portuguese	-	Avalia a percepção dos pacientes em relação ao status atual de saúde, satisfação em relação à informação dada sobre seu status de saúde; nível de felicidade e visão sobre o futuro	5 itens	5 questões fechadas - escala tipo Likert: muito ruim; ruim; nem bom, nem ruim; bom; muito bom OU não concordo; concordo ligeiramente; concordo bastante; concordo totalmente OU infeliz; pouco feliz; bastante feliz; muito feliz relacionadas a percepção do status de saúde, satisfação em relação a informação dada sobre o status de saúde, visão sobre o futuro, medo do futuro, nivel de felicidade (variáveis dependentes e ordinais)
2013	Schütz et al., 2013[118]	Happiness-Increasing Strategies Scales	-	Mede estratégias utilizadas para aumentar a felicidade	8 grupos	Escala organizada em 8 grupos: relações sociais; festas e boates; controle da mente; busca da meta; lazer passivo; lazer ativo; religião; tentativas diretas. O participante deve apontar entre 1 = nunca a 7 = o tempo todo
2013	Tse et al., 2013 [119]	Life Satisfaction Index-A Form Scale	-	Mede a satisfação com a vida	18 itens	Composta por 18 questões (1 = sim/ 0 = não) relacionadas a 5 diferentes componentes: entusiasmo; resolução e coragem; congruência entre objetivos almejados e conquistados; auto-conceito positivo; tom de humor. O resultado varia de 0 a 18, quanto maior a numeração, mais satisfeito com a vida é o indivíduo

Embora existam inúmeros instrumentos para se avaliar felicidade e bem-estar, estes apresentam apenas um domínio de avaliação específico e sabe-se que medidas para tais construtos são complexas e devem ser avaliadas sob componentes diferentes como, por exemplo, satisfação com a vida, emoções positivas, estratégias psicológicas e bem-estar social. Por isso, foi vista a necessidade de realizar a validação psicométrica da *The Pemberton Happiness Index* (PHI), por se tratar de uma escala desenvolvida com base em quatro domínios, curta e confiável e que até o início do estudo não havia sido validada para o português[116].

Esta escala possui onze itens relacionados a diferentes domínios do bem-estar vivenciado (Geral, Hedônico, Eudaimônico e Bem-estar Social) e dez itens relacionados ao bem-estar vivido recentemente (eventos positivos e negativos ocorridos no dia anterior). Os domínios da escala PHI são:

a. **Bem-estar Geral:** Incluídos dois itens relacionados com a satisfação global com a vida e um item de vitalidade, uma vez que está intimamente associada com o funcionamento eudaimônico[120].

b. **Bem-estar Eudaimônico:** Contempla itens que abrangem o funcionamento psicológico ideal, obtidos a partir do modelo psicológico de "Bem-estar de Ryff" [121]. São 12 itens relacionados aos subdomínios que são equivalentes a seis áreas de bem-estar psicológico de Ryff: o significado da vida, autoaceitação, crescimento pessoal, relacionamento, percepção de controle e autonomia.

c. **Bem-estar Hedônico:** Possui dois itens que avaliam a frequência de afeto positivo e dois que avaliam o afeto negativo.

d. **Bem-estar Social:** Embora existam vários componentes do bem-estar social[11, 122], foram selecionados dois itens que visam explorar o sentimento global de viver em uma sociedade que promove o funcionamento psicológico ideal.

1.3 Aplicação de instrumentos de avaliação

Diversos instrumentos de avaliação em saúde têm sido utilizados a fim de verificar inúmeras dimensões como funcionamento físico, emocional, social, dor, fadiga, outros sintomas e toxicidades. Muitas representam abstrações, ou seja, "construções teóricas que objetivam organizar e atribuir significados a percepções que não podem ser mensuradas por atributos ou indicadores, sendo chamadas de construtos teóricos"[123]. Um grande número

destes instrumentos, também chamados questionários ou escalas são utilizados em diversas circunstâncias, buscando obter através de seus índices, benefícios para o indivíduo que está sendo avaliado. Tem ganhado destaque a importância de considerar a visão do indivíduo sobre aspectos da doença[124], refletindo suas perspectivas, que podem verificar a eficácia de tratamentos, influenciando as decisões no cuidado à saúde[125-127]. As medidas obtidas por meio destes instrumentos podem ser entendidas como mecanismos que associam conceitos abstratos com indicadores observáveis e mensuráveis[128] . Por isso, a importância de se determinar a correta avaliação das qualidades psicométricas dos diversos instrumentos de coleta de dados[127, 129].

A escolha da administração do instrumento ou método de coleta de dados deve ser avaliada para que sejam obtidas as medidas mais fidedignas. Possíveis modos de administração incluem: (1) entrevista, onde um profissional aplica o instrumento; (2) autoadministração com base em papel, em que o próprio respondente lê e responde os itens em papel utilizando lápis ou caneta; (3) *softwares* com resposta de voz interativa, através de programas de computador e utilizando *tablets* o respondente ouve uma voz interativa e escolhe a opção de resposta mais adequada; (4) formato eletrônico na web, onde os instrumentos são disponibilizados por meio de "*surveys*" através de sites, e-mails e redes sociais para que o respondente participe de qualquer lugar que possua internet, por exemplo, por meio de softwares de computadores, *tablets* e celulares. Fica a cargo do pesquisador, a partir dos objetivos da pesquisa e do perfil da população a ser estudada, escolher qual a forma mais adequada de aplicação dos instrumentos de avaliação.

1.4 Estudos realizados por meio de redes sociais

Na atualidade, a distribuição de informações encontrou uma nova rota, a internet, e pode assim chegar a um número inimaginável de pessoas. A popularidade das redes sociais tem sido imensamente importante para a comunicação e troca de informações. Utilizá-las para coleta de dados em pesquisas em saúde seria uma estratégia positiva considerando o custo-benefício, uma vez que são livres de custos financeiros, demanda um curto período de tempo e maximiza o recrutamento, sendo um complemento aos métodos tradicionais[130-133].

De uma perspectiva da área da saúde, as redes sociais estão sendo utilizadas por uma variedade de razões, incluindo o reforço de *networking* profissional e

educação, comunicação com o paciente, cuidados e educação, programas de saúde pública, promoção organizacional e realização de pesquisas[134-136].

Estudos prévios propuseram as redes sociais como uma nova modalidade para promoção e recrutamento de estudos científicos[137-140]. A rede *YouTube* conta com mais de 645 milhões de usuários e o *Facebook* e o *Twitter* contam com mais de um bilhão de usuários cada um, sendo o *Facebook* a maior e mais popular rede social do mundo atualmente[141-144]. Dados concretos revelam que 48% de todos os seus usuários realizam *loggins* em qualquer dia da semana[143]. Em 2016, o aplicativo de comunicação de mensagens instantâneas *WhatsApp* atingiu a marca de mais de um bilhão de usuários, sendo onipresente, gratuito e fácil de usar[145, 146]. Tais características fizeram das redes socais potencial e valioso recurso para se promover o recrutamento de participantes de pesquisa, podendo atingir grandes populações rapidamente.

A rede social *Facebook* está entre as três plataformas de mensagens mais utilizadas por adultos jovens, sendo que 79% dos participantes relatam verificar sua conta pelo menos uma vez ao dia[147]. Cerca de 90% dos adultos jovens possuem conta em redes sociais, com a maioria utilizando dois ou mais sites de mídia social, tendo o hábito de visitá-los diariamente[148].

Em comparação ao formato papel e lápis tradicional, a coleta de dados através da Internet tem o potencial para reduzir a perda de dados e aumentar a privacidade do participante, ambas características importantes em estudos científicos. Em comparação à coleta de dados por meio de papel e lápis, a qualidade dos dados em pesquisas *on-line* utilizando diferentes medidas de bem-estar subjetivo encontrou resultados equivalentes entre estes dois diferentes métodos de coleta[133]. Apesar de grandes amostras poderem ser recrutadas de forma rápida e com baixo custo usando as redes sociais *on-line*, as amostras não representativas da população são uma limitação potencial[149].

Algumas outras limitações já são esperadas quando se realiza pesquisas através de plataformas *on-line*, incluindo: “fadiga” da pessoa em responder os instrumentos, questões relativas à garantia de uma amostra representativa, questões de privacidade/anonimato, necessidade de instruções e opções de respostas muito claras e precisas (para melhor entendimento dos respondentes). Os participantes podem experimentar frustração, particularmente em relação às questões obrigatórias, além do mais, o número de questões não respondidas pode ser elevado[150-154]. Adicionalmente, inquéritos *on-line* não impedem o

uso de um mesmo computador ou endereço IP *(Internet Protocol)* para a participação, a menos que o controle de acesso da pesquisa seja utilizada[155].

Um aspecto metodológico a ser considerado é que o acesso à Internet pode afetar os dados demográficos da amostra[156, 157], podendo esta ser composta por nível mais alto de escolaridade[158]. Participantes de estudos que acontecem por meio de redes sociais podem representar grupos etários mais jovens em relação aos grupos etários mais velhos, o que pode ser uma das limitações de estudos cujo recrutamento ocorre através de destas redes[134, 159] até mesmo porque os usuários mais jovens tendem a permanecerem por tempo maior em atividades sociais *on-line*[160, 161].

Apesar das possíveis limitações, tais dados revelam a possibilidade de se realizar pesquisas através das redes sociais, sendo esta, uma forma de complemento aos métodos tradicionais e uma maneira de se conseguir avaliar e alcançar um grande número de indivíduos de diferentes regiões e populações, com menor custo financeiro e em um curto espaço de tempo.

1.5 Implicações práticas dos resultados deste estudo

A busca pelo bem-estar e felicidade é inerente à condição humana. A identificação de condições associadas à maior percepção de felicidade poderá fornecer subsídios para políticas públicas nacionais que visem melhorar as condições de vida da população. O que deve ser estimulado (ou desestimulado), dentro do contexto da felicidade individual, ainda não é conhecido, especialmente em nossa realidade. Além do mais, o Brasil tem atravessado ao longo dos últimos anos uma época de instabilidade política e econômica. Assim, os resultados deste estudo poderão auxiliar o entendimento sobre o impacto de tal crise na vida das pessoas.

Como o Hospital de Câncer de Barretos (HCB) atende a um número grande de pacientes oncológicos de todo o Brasil e tem em sua filosofia de trabalho o foco na humanização do atendimento, os resultados do presente estudo poderão ser úteis no futuro. O Grupo de Pesquisa em Cuidados Paliativos e em Qualidade de Vida (GPQual) do HCB tem todo o interesse neste tipo de pesquisa, que enxerga o cidadão brasileiro como merecedor de receber cuidados de saúde adequados, respeito à individualidade e estímulo a práticas de vida saudáveis. Além do mais, iremos comparar os índices de felicidade, satisfação com a vida e afetos positivos e negativos entre pessoas da população geral e

indivíduos com câncer, de forma a entender o impacto do diagnóstico do câncer e seu tratamento na vida das pessoas. De forma complementar, iremos avaliar o impacto de ter um ente querido com doença crônica potencialmente grave (câncer) nos índices de felicidade, satisfação com a vida e afetos positivos e negativos.

2 JUSTIFICATIVA

Muito se tem estudado a respeito da felicidade (e seus construtos relacionados) na busca de identificar fatores associados, principalmente aqueles passíveis de modificação, tanto a nível individual quanto coletivo. Inúmeras condições já foram reportadas como associadas à percepção de felicidade. No entanto, além de condições genéticas predisponentes, os fatores socioculturais, distintos entre diferentes populações, são provavelmente modificadores das "receitas" para a felicidade. No Brasil, país continental de tradicionais multiculturais, ainda não foram mensurados os índices de felicidade, satisfação com a vida e afetos positivos e negativos dentre de um contexto globalizado. Assim, não se conhece os fatores que influenciam de forma mais significativa na percepção de felicidade no Brasil. Este estudo se justifica por esta carência da literatura científica. Além do mais, o impacto positivo de uma doença crônica – como o câncer e o fato de cuidar de um ente querido com doença crônica, ainda não foram devidamente investigados.

3 OBJETIVOS

3.1 Objetivo geral

- Avaliar os índices de felicidade, satisfação com a vida e percepção de afetos positivos e negativos da população brasileira e identificar condições associadas à percepção individual de felicidade.

3.2 Objetivos específicos

- Avaliar as propriedades psicométricas da escala "Índice de Felicidade de Pemberton (PHI) – Português Universal".
- Identificar condições associadas com felicidade e satisfação com a vida da população geral.
- Avaliar o impacto do diagnóstico de câncer (atual ou prévio) na percepção individual de felicidade, satisfação com a vida e afetos positivos e negativos.
- Avaliar o impacto do fato de ter um pessoa próxima com diagnóstico de câncer (atual ou prévio) na percepção individual de felicidade, satisfação com a vida e afetos positivos e negativos.
- Avaliar os percentuais de indivíduos felizes, e as médias de felicidade, satisfação com a vida e afetos positivos e negativos em função dos Índices de Desenvolvimento Humano (IDH) e Vulnerabilidade Social (IVS) referentes à cidade onde o participante reside.
- Definir o percentual de brasileiros adultos, das cinco regiões do Brasil (Norte, Sul, Sudeste, Nordeste e Centro-Oeste), que se consideram felizes.

4 ARTIGO 1

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4.1 The Pemberton Happiness Index: Validation of the Universal Portuguese version in a large Brazilian sample

4.1.1 Abstract

The Pemberton Happiness Index (PHI) is a recently developed integrative measure of well-being that includes components of hedonic, eudaimonic, social, and experienced well-being. The PHI has been validated in several languages, but not in Portuguese. Our aim was to cross-culturally adapt the Universal Portuguese version of the PHI and to assess its psychometric properties in a sample of the Brazilian population using online surveys.

An expert committee evaluated 2 versions of the PHI previously translated into Portuguese by the original authors using a standardized form for assessment of semantic/idiomatic, cultural, and conceptual equivalence. A pretesting was conducted employing cognitive debriefing methods. In sequence, the expert committee evaluated all the documents and reached a final Universal Portuguese PHI version. For the evaluation of the psychometric properties, the data were collected using online surveys in a cross-sectional study. The study population included healthcare professionals and users of the social network site Facebook from several Brazilian geographic areas. In addition to the PHI, participants completed the Satisfaction with Life Scale (SWLS), Diener and Emmons' Positive and Negative Experience Scale (PNES), Psychological Well-being Scale (PWS), and the Subjective Happiness Scale (SHS). Internal consistency, convergent validity, known-group validity, and test–retest reliability were evaluated. Satisfaction with the previous day was correlated with the 10 items assessing experienced well-being using the Cramer *V* test. Additionally, a cut-off value of PHI to identify a "happy individual" was defined using receiver-operating characteristic (ROC) curve methodology.

Data from 1035 Brazilian participants were analyzed (health professionals = 180; Facebook users = 855). Regarding reliability results, the internal consistency (Cronbach alpha = 0.890 and 0.914) and test–retest (intraclass correlation coefficient = 0.814) were both considered adequate. Most of the validity hypotheses formulated a priori (convergent and know-group) was further confirmed. The cut-off value of higher than 7 in remembered PHI was identified (AUC = 0.780, sensitivity = 69.2%, specificity = 78.2%) as the best one to identify a happy individual.

We concluded that the Universal Portuguese version of the PHI is valid and reliable for use in the Brazilian population using online surveys.

4.2 Keywords

Happiness, instrument, subjective well-being, survey, validation

4.3 Introdution

The number of studies aiming at discovering what happiness is and how happy people are has increased over time. There are many definitions of happiness, most of which allude to a positive emotional state, including feelings of well-being and pleasure, as well a fulfilling satisfactory life.[1,2] Subjective well-being has been defined as “a person's cognitive and affective evaluations of his or her life as a whole”[3]; “happiness” and “subjective well-being” can be considered synonymous and are used interchangeably in the present paper. One of the findings with the widest consensus is that human beings actively look for to increase or to maintain their personal well-being independently from the meaning each individual attributes to it.[4–6]

The relevance of human happiness is supported by the fact that United Nations (UN) passed a resolution recognizing the pursuit of happiness as a fundamental human goal. More than an individual endeavor, the UN emphasizes the importance of public policies to promote well-being and encourage each country to elaborate measures of happiness reflecting their own characteristics.[7]

Several studies sought to correlate the determinants of subjective well-being with personal experiences. Some recent research found a strong relationship between a person's positive or negative experiences and his or her state of physical and mental health.

Therefore, emotional constructs demonstrate the different ways individuals react to stressing or negative events that can affect their physical health.[8,9]

Subjective well-being is typically measured based on self-report data.[10] Different questionnaires have been developed for this purpose without a gold-standard measure. Among several instruments available to measure happiness[2,11–14] we identified and selected the Pemberton Happiness Index (PHI),[15] as it was initially designed as a comprehensive measure of well-being using a cross-cultural approach. The PHI has demonstrated adequate psychometric properties (good internal consistence, single-factor structure, and adequate convergent and incremental validity), and has been previously validated in 7 different languages, but not in Portuguese language. The PHI consists of 11 items related to different domains of remembered well-being (i.e., general, hedonic, eudaimonic, and social well-being) and 10 items related to experienced well-being (i.e., positive and negative events that occurred the day before). As the PHI exhibits satisfactory psychometric properties, this simple and integrative index may be used as an instrument to monitor changes in subjective well-being in future clinical and population studies.[15] Of note, we are particularly interested in its potential use as an online validated tool, as it would ease to collect data in larger and diverse samples with lower costs.

The aims of the present study were to cross-culturally adapt the Universal Portuguese version of the PHI and to assess its psychometric properties in a large sample of the Brazilian population using online surveys.

4.4 Methods

4.4.1 Study design and participant selection

This cross-sectional study applied techniques for the adaptation and validation of the assessment instrument. The data were collected from November 2014 to November 2015 using SurveyMonkey. The study population included professionals from the Barretos Cancer Hospital (HCB, Barretos, São Paulo, Brazil), a reference center for cancer care in Brazil, and users of the social network site Facebook (Facebook, Inc., Menlo Park, CA; http://www.facebook.com) from several Brazilian regions across the whole country. Individuals above 18 years old from both genders were included.

4.4.2 Sample

Two different samples were analyzed together: Sample 1 consisted of 180 professionals of a large Oncology hospital (HCB), and Sample 2 consisted of 855 individuals from the Brazilian general population. The total combined sample consisted of 1035 participants. Given that a separate data analyses using item response theory was planned, but not reported in the present paper, a sample of at least 1000 individuals was judged statistically robust for that analyses.

4.4.3 Ethical issues

The study was performed in accordance with the ethical standards of the Declaration of Helsinki and the Brazilian National Health Council Resolution no. 466/2012 and was approved by the Ethics Committee of the Barretos Cancer Hospital (no. HCB 886/2014 and 940/2015). Volunteers manifested their agreement to participate in the study via the informed consent form included in the survey form.

4.4.4 Data collection

Sample 1: E-mails were sent to 372 health professionals whose e-mail addresses were registered with the hospital, explaining the study and containing a link that directed the participants to the survey. Invitations were sent up to 4 times at 1-week intervals.

Sample 2: The survey link, along with an invitation to participate, was published on the personal Facebook profile pages of 3 of the authors (BSRP, MGC, and CEP). Participants were also encouraged to share the link on their own pages, thus spreading the link among potential participants. Only participants who had complete data on all the questionnaire variables used were entered in the analyses.

After clicking the study link, the respondents in both Samples 1 and 2 were directed to the study's page on the online program SurveyMonkey by registering on the site (https://pt.surveymonkey.com).

To assess the test–retest reliability, a second e-mail was sent to the healthcare professionals 15 days after the first one. This time interval for the retest was chosen according with Terwee et al[16] and based on previous similar validation studies.[17–19]

4.4.5 Instrument under validation

4.4.5.1 Pemberton Happiness Index (PHI)

The PHI was designed to measure happiness in the general population. It consists of 11 items related to remembered well-being, each with a 11-point Likert scale, and 10 items related to experienced well-being (positive and negative events that occurred the day before), with dichotomous response options (yes/no). Although initially developed covering hedonic, eudaimonic, and social aspects of well-being, the remembered well-being scale of PHI is considered unidimensional. The remembered well-being score is calculated with the mean score of the first 11 items (items r1 to r11) and may vary from 0 to 10; the 10 items from the experienced well-being (items e1 to e10) is converted into a single score from 0 (zero positive experiences and 5 negative experiences) to 10 (5 positive experiences and no negative experiences). Thus, PHI produces both remembered and experienced well-being scores, and the sum of the corresponding scores produces a combined well-being index (total PHI). In previous validation studies, Cronbach alpha (internal consistency) was 0.82 to 0.83.[15]

4.4.6 Validation measures

The following instruments were selected because they have been widely used worldwide and have been previously validated in Brazil. Additionally, they were used as validation measures in the initial validation study of PHI.[15] Both the Satisfaction with Life Scale (SWLS) and the Subjective Happiness Scale (SHS) were chosen to be used in the present study in order to correlate general and social aspects of well-being with the PHI scores (items r1, r2, and r11); the Diener and Emmons' Positive and Negative Experience Scale (PNES) was used to correlate hedonic negative and positive affect scores with the PHI scores (items r9 and r10); and the Psychological Well-being Scale (PWBS) was used to correlate eudaimonic construct measures with the PHI scores (items r3 to r8). Detailed characteristics of the validation instruments are described below.

4.4.6.1 Satisfaction with Life Scale (SWLS)

The SWLS consists of 5 items that assess the cognitive component of SWLS that are answered on a 7-point scale ranging from a score of 1 (strongly disagree) to 7 (strongly agree).[20] In the Brazilian validation study,[21] the SWLS was named *Escala de Satisfação com*

a Vida (*ESV*) and exhibited a Cronbach alpha of 0.89. It is a brief, simple, and multiple-item scale with a single-factor structure, which makes SWLS the most widely used instrument to assess global satisfaction with life. It has been applied in various languages and cultures exhibiting satisfactory psychometric properties.[22,23] It has been validated using Internet surveys.[24]

4.4.6.2 Diener and Emmons' Positive and Negative Experience Scale (PNES)

The Diener and Emmons' PNES assesses positive and negative affect by inquiring as to the extent to which respondents experienced each of the listed emotions (1 none, 7 extremely) in the past days. The original version of the scale consisted of 9 items, 4 for positive affect and 5 for negative affect.[25] To balance the number of items in the 2 subscales, the adjective "optimist" was added to the list of positive affects in the Brazilian version, thus increasing the number of items to 10. In the modified Brazilian Diener and Emmons' PNES (with addition of the adjective "optimist"), both the negative ($\alpha = 0.78$) and positive ($\alpha = 0.81$) experience scales exhibited high internal consistency.[26]

4.4.6.3 Psychological Well-being Scale (PWBS)

The 6 dimensions of the construct psychological well-being were established based on humanistic-existentialist theories of human development and mental health, resulting in the PWBS,[27] known in Brazil as *Escala de Bem-estar Psicológico* (*EBEP*). The scale consists of 36 items and 6 dimensions that assess eudaimonic well-being: positive relations with others, autonomy, environmental mastery, personal growth, purpose in life and self-acceptance.[28] These dimensions are positively associated with measures of satisfaction with life, positive affect, and balanced affect and are negatively associated with measures of negative affect and depression.

4.4.6.4 Subjective Happiness Scale (SHS)

The SHS is based on the respondents' subjective assessment of their happiness from their own perspective. It consists of 4 items; the first 2 seek to characterize respondents in absolute (how happy they consider themselves to be) and relative (how happy they feel compared to others) terms. The last 2 items describe happy and unhappy individuals, respectively, and respondents are requested to grade the extent to which the

characterizations apply to them. The SHS assesses the respondents' overall appreciation of life and their personal feelings of happiness. It has been validated in several countries with different types of samples, and the results indicated high internal consistency and adequate test–retest reliability.[29] It has also been validated using Internet surveys.[24]

4.4.7 Other assessment instruments (developed for the present study)

Sociodemographic data, including age, gender, marital status, religion, and region of origin, among others, along with self-perceived health and beliefs of optimism/pessimism were included in the survey. In addition, the following question addressing perception of happiness was developed for the present survey: "in general, do you consider yourself as…" The possible answers were "very unhappy," "unhappy," "more or less happy," "happy," and "very happy."

4.4.8 Validation procedures

Two phases were included in the validation procedure:

4.4.8.1. Phase I—cultural adaptation

The PHI previously translated into universal Portuguese by Hervás and Vázquez[15] had 2 versions constructed following the forward and back-translation procedure.[30] We analyzed both and concluded that a single version should be developed. An expert committee composed of 2 doctors, a nurse, a Portuguese teacher, and 2 biomedical researchers evaluated the 2 versions using a standardized form for assessment of semantic/idiomatic, cultural and conceptual equivalence. Of the 6 members of the expert committee, 2 were born in Portugal and the others in Brazil. The members independently assessed each instrument item and scored them relative to each type of equivalence as follows: (−1) nonequivalent; (0) impossible to assess/I do not know; or (+1) equivalent. Changes were suggested for items scored −1 or 0. The panel met at a later time to discuss the assessments and arrived at a consensus version. A pretesting was conducted in Brazilian participants using a cognitive debriefing with think-aloud method (asking each participant what each item means).[31] After the pretesting, the expert committee evaluated all the documents and reached a final consensus. The final adapted version was discussed and approved by the authors of the original scale.[30]

4.4.8.2. Phase II—psychometric properties

Internal consistency

Internal consistency was assessed using Cronbach alpha coefficient, which should be ≥0.70 to be considered adequate.[16]

Test–retest reliability

Test–retest reliability was assessed using the intraclass correlation coefficient; values above 0.70 were rated as adequate.[16]

Hypothesis testing (construct validity)

Construct validity was assessed by testing the following predefined hypotheses:

1. *Convergent validity* - We expected that the total PHI and remembered PHI scores would be positively correlated with the global scores on the SWLS and SHS and with the PWBS domains. Correlation coefficients higher than 0.4 were expected.[32] In addition, we expected positive correlations with the PNES (positive experiences) and negative correlations with the PNES (negative experiences). In addition, similarly to the original development study, analyses of other possible correlations were planned a priori (as described in **Table 1**).

2. *Known-group validity* - Known-groups method (also known as extreme-groups method) is one of the approaches of evaluating construct validity. An instrument is considered to exhibit known-groups validity if its scores clearly discriminate between groups of participants with known different features.[16,33] In the present study, the participants were inquired as to whether they are pessimistic, neither pessimistic nor optimistic, or optimistic. Our hypothesis was that the happiness scores would be higher among the optimistic participants compared to all others. A second known-group analysis was performed relative to self-perceived happiness; the participants were divided into 2 groups: not happy and happy. Our hypothesis was that the happiness scores would be higher among the participants self-described as happy compared to the unhappy. Although findings can be considered obvious, the addition of this second know-group analysis were considered important by the authors because compared groups were clearly distinct (extreme) in

relation to the construct measured (i.e., happiness). These comparisons were performed using parametric *t* tests and analysis of variance (ANOVA).

Assessment of experienced happiness

To validate experienced happiness, the participants were asked: "Overall, how did you feel yesterday?" Possible answers were "very bad," "bad," "neither bad nor well," "well," and "very well." Then, each item of the experiential PHI (5 items describing negative experiences the day before and 5 items describing positive ones) was correlated with the overall perception of the previous day using Cramer *V*.

4.4.8.3. Determination of a cut-off point to identify happy individuals using the PHI

To establish a cutoff point likely to identify happy individuals accurately, a receiver-operating characteristic (ROC) curve was plotted. The happiness criterion was defined by asking the participants to what extent they considered themselves "very unhappy," "unhappy," "more or less happy," "happy," or "very happy." Categories "very unhappy," "unhappy," and "more or less happy" were analyzed together as "not happy," and categories "happy" and "very happy" were analyzed together as "happy." The mutual accuracy of the total PHI, experienced PHI, and remembered PHI scores was compared following DeLong et al.[34] The sensitivity and specificity values and the positive (LR+) and negative (LR−) likelihood ratios were calculated.

Statistical analyses were performed using SPSS (version 20.0; SPSS, Chicago, IL) and MedCalc (version 14.8.1, MedCalc Software, Ostend, Belgium) statistical softwares. *P*-values below 0.05 were considered statistically significant.

4.5 Results

4.5.1Phase I—cultural adaptation

In the pretesting, 10 patients with cancer (2 were illiterate and 4 had low than 8 years of education) and 5 health professionals answered the scale in "paper and pencil" form and 12 health professionals completed the scale using the online survey. In general, both forms were adequately understood by the participants. Of the 21 items, 8 suffered minor modifications by the expert committee after the pretesting. The original, the translated, and

the final versions are presented in **Table 2**; modifications needed are highlighted in the table.

4.5.2. Phase II—psychometric properties

4.5.2.1. Sample

Of the 189 individuals in Sample 1 who responded to the online survey, 180 answered all items, and their data were analyzed (180 of 372, response rate = 48.3%). Most of the participants were female (n = 99, 52.4%), 18 to 39 years old, from Southeastern Brazil and had more than 11 years of formal education. Most of such participants were healthcare professionals (n = 129, 71.6%) (please see **Table 3**). Regarding Sample 2 (i.e., participants who answered the survey via Facebook), 972 participants accepted to participate in the study and 855 (87.9%) completed all the survey items. Most were female (n = 663, 77.5%), aged 18 to 39 years old, resided in Southeastern Brazil (n = 621, 72.5%), and had more than 11 years of formal education (n = 765, 89.4%), being the largest fraction healthcare professionals (n = 293, 34.2%). **Table 3** describes the characteristics of the participants in Samples 1 and 2.

4.5.2.2. Internal consistency

Taken together data from both samples, Cronbach alpha values were considered adequate: its value was 0.890 (95% confidence interval [CI] 0.890–0.900) when including the experienced well-being score as a different item (11 + 1 items) and 0.914 (95% CI: 0.906–0.922) when including only the 11 items from the remembered PHI domain. Only exclusion of items 10 and 11 somewhat improved the instrument's internal consistency (increasing from 0.914–0.936 in the case of item 10 and to 0.917 in the case of item 11) (**Table 4**).

4.5.2.3 Test–retest

Ninety-four of the participants in Sample 1 (49.7%) answered the survey a second time, 14 to 21 days after the first. The value of the intraclass correlation coefficient was 0.814 (95% CI: 0.733–0.873).

4.5.2.4 Convergent and divergent validity

The PHI total score was positively correlated with the SWLS global score (r = 0.513, P < 0.001, n = 1032), the SHS global score (r = 0.646, P < 0.001, n = 171), and the PNES positive experience scale (r = 0.523, P < 0.001, n = 1032). As expected, the PHI total score was negatively correlated with the PNES negative experience scale (r = −0.383, P < 0.001, n = 1032). The correlations between the PHI total score and the PWS domains varied from 0.284 (autonomy) to 0.699 (purpose in life) (data not shown). In regard to the correlations hypothesized a priori between specific PHI items and the other instruments, 9 out of 14 such correlations exhibited r > 0.4; however, the r values of the other correlations were close to 0.4 (**Table 1**).

4.5.2.5 Known-groups validity

The mean remembered PHI and total PHI scores differed significantly according to the groups of participants in regard to the perception of optimism/pessimism and self-reported happiness, as was hypothesized (**Table 5**).

4.5.2.6 Assessment of experienced happiness

The Cramer V coefficients between satisfaction with the previous day and the 10 items assessing experienced well-being (5 positive and 5 negative) were all above 0.3; only the item “Something I did made me proud” had a nonsignificant P-value (P = 0.062). Two items corresponding to negative experiences were strongly associated with self-perceived satisfaction with the previous day: “I was bored for a lot of the time” (Cramer V = 0.678, P < 0.001) and “Things happened that made me really angry” (Cramer V = 0.651, P < 0.001) (**Table 6**).

4.5.2.7 ROC curves

The area under the curve (AUC) values of the ROC curves plotted to detect happiness (yes vs no) were as follows: experienced PHI (AUC = 0.702, 95% CI: 0.671–0.733), remembered PHI (AUC = 0.780, 95% CI: 0.750–0.807), and total PHI (AUC = 0.747, 95% CI: 0.717–0.776). When compared, the AUC for remembered PHI was significantly larger compared to those for both experienced PHI and total PHI (P < 0.001 in both) (**Fig.1**). The

cutoff point with greatest diagnostic accuracy was >7 for remembered PHI (sensitivity = 69.2%, specificity = 78.2%, positive LR = 3.19, and negative LR = 0.39).

4.6 Discussion

In the present study, the Universal Portuguese version of PHI was first culturally adapted and then validated in a large sample from the Brazilian population. The scale's psychometric properties were considered adequate in light of classic psychometrics.

Internet research is considered a cost- and time-efficient way to access a large number of participants.[24]Moreover, compared to traditional paper-and-pencil formats, Internet data collection has the potential to reduce loss of data and increase participant's privacy, both important characteristics in questionnaire validation studies. In the Sample 2 of our study, 3 of the authors disclosed the invitation to participate in the study on their personal Facebook pages and asked their friends to share it. Although the dissemination of survey links by e-mail or through online social networks sharing is quite usual, this strategy is a rather unusual approach to the validation of instruments for health assessment. By sharing the invitation with the authors' friends and requesting the latter to share it with their own friends, the survey link quickly spread, and 855 individuals had fully answered the survey 15 days later. Howell et al[24] compared the quality of data collected using "paper-and-pencil," computer-based, and Internet surveys using different measures of subjective well-being and found equivalent results between the different methods of data collection. Similarly, Internet surveys were shared on social-networking Web sites. Given the increasing prevalence of online social networks, future questionnaire validation studies may take advantage of fast dissemination of online surveys. On the other hand, that fact can explain the large proportion of healthcare professionals in the final Sample 2, as the 3 authors are healthcare professionals, and so this potential bias and limitation should be addressed and overcome in future studies.

Regarding the psychometric properties of the Universal Portuguese version of the PHI, the results are quite similar to those reported in the original study of Hervás and Vázquez.[15] The scale was originally developed in Spanish and was simultaneously translated and validated in other 6 languages (i.e., German, English, Swedish, Russian, Turkish, and Japanese) to select its final items from data gathered in 9 countries. The Cronbach alpha values observed in our study (0.890 and 0.914) were very similar to those reported in the

original study, which ranged from 0.82 to 0.93. Moreover, in general, the convergent/divergent validity and known-groups indices were considered adequate. Interestingly, and unlike the initial validation study,[15] we conducted a known-group validation analysis relative to the perceptions of happiness and optimism/pessimism.

Population-based intervention strategies within the political–social setting should be employed; and such strategies require adequate tools to measure the resulting benefits. The cut-off point established in the present study for the identification of happy individuals might be useful in future population-based studies using PHI as an instrument to assess happiness. In this case, we suggest that remembered PHI scores higher than 7 should be tentatively considered to identify a "happy" Brazilian individual. However, further studies are needed to confirm the validity of this cut-off value in different populations. In addition to the cut-off point, the identification of the minimal clinically important difference (MCID) might also be useful.

The present study had some limitations. The first limitation derives from the representativeness of the included sample, with inclusion of large proportion of participants with high socioeducational levels (most healthcare professionals), which does not correspond to the Brazilian general population. Although large samples can be recruited fast using online social networks with low cost, nonrepresentative samples are a potential limitation. However, we believe that this limitation is minor in validation studies, but potentially more relevant in intervention or cross-cultural studies. Another study limitation is the lack of a Portuguese sample. Although our PHI version is developed to be valid both in Brazil and Portugal (i.e., Universal Portuguese version), it was not tested in participants from Portugal. Thus, currently, it should be considered valid for use only in Brazil, and a subsequent study in Portugal is warranted.

We conclude that the Universal Portuguese version of the PHI is valid and reliable for use in the Brazilian population using online surveys. The cut-off point to define a happy individual was defined, but the MCID should be investigated in future studies.

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Table 1. Pearson correlations for remembered well-being items and the PHI's remembered score (excluding experienced well-being).

Domains and subdomains	Reference scales	Correlation coefficient
General well-being	SWLS	r=0.492 (item r1)*
		r=0.375 (item r2)
	SHS[1]	r=0.675 (item r1)*
		r=0.434 (item r2)*
Eudaimonic wellbeing		
Life meaning	PWBS: Purpose in life[1]	r=0.659 (item r3)*
Self-acceptance	PWBS: Self-acceptance[1]	r=0.614 (item r4)*
Personal growth	PWBS: Personal growth[1]	r=0.475 (item r5)*
Relatedness	PWBS: Positive relationships[1]	r=0.361 (item r6)
Competence	PWBS:Environmental control[1]	r=0.498 (item r7)*
Autonomy	PWBS: Autonomy[1]	r=0.345 (item r8)
Hedonic well-being		
Positive affect	PNES: Positive experience	r=0.521 (item r9)*
Negative affect	PNES: Negative experience	r=0.381 (item r10)
Social well-being	SWLS	r=0.368 (item r11)
	SHS[1]	r=0.418 (item r11)*

Legend: SWLS=Satisfaction With Life Scale; SHS=Subjective Happiness Scale; SWDL=Satisfaction With Domains of Life; PNES=Positive and Negative Experience scale.
[1]PWBS and SHS were applied for only 180 participants.
*Correlation coefficients >0.4.

Table 2. Description of the original English PHI version, synthesized PHI version, and final Portuguese Universal PHI version.

Item	Origial version - English	Portuguese Universal synthesized PHI version – before pretesting	Portuguese Universal final PHI version - after pretesting[1]
	The Pemberton Happiness Index	Índice de Felicidade de Pemberton	Índice de Felicidade de Pemberton
1	I am very satisfied with my life	Sinto-me muito satisfeito(a) com a minha vida.	Sinto-me muito satisfeito/a com a minha vida
2	I have the energy to accomplish my daily tasks	Tenho energia suficiente para cumprir minhas tarefas cotidianas.	Tenho energia suficiente para cumprir as minhas tarefas **do dia a dia**
3	I think my life is useful and worthwhile	Acredito que a minha vida é útil e valiosa	**Penso** que a minha vida é útil e valiosa
4	I am satisfied with myself	Sinto-me satisfeito(a) comigo mesmo(a	Sinto-me satisfeito/a comigo mesmo/a
5	My life is full of learning experiences and challenges that make me grow	A minha vida está repleta de aprendizagens e desafios que me fazem crescer	A minha vida está repleta de aprendizagens e desafios que me fazem crescer
6	I feel very connected to the people around me	Sinto-me muito ligado(a) às pessoas que me rodeiam	Sinto-me muito ligado/a às pessoas que me rodeiam
7	I feel I am able to solve the majority of my daily problems	Sinto-me capaz de resolver a maioria dos problemas do meu dia a dia	Sinto-me capaz de resolver a maioria dos problemas do meu dia a dia
8	I think that I can be myself on the important things	Acredito que posso ser eu mesmo (a) nas coisas realmente importantes	**Penso** que posso ser eu mesmo/a nas coisas realmente importantes
9	I enjoy a lot of little things every day	Desfruto muito das pequenas coisas todos os dias	Desfruto muito das pequenas coisas todos os dias
10	I have a lot of bad moments in my daily life	Tenho muitos momentos ruins durante o meu dia a dia.	Tenho muitos momentos ruins/**maus** durante o meu dia a dia
11	I think that I live in a society that lets me fully realize my potential	Acredito que vivo em uma sociedade que me permite desenvolver plenamente o meu potencial	**Penso** que vivo em uma sociedade que me permite desenvolver plenamente o meu potencial
12	Something I did made me proud	Senti-me orgulhoso(a) com algo que fiz	Senti-me orgulhoso/a com algo que fiz
13	At times, I felt overwhelmed	Em alguns momentos eu me senti muito sobrecarregado(a)	Em alguns momentos **senti-me** muito sobrecarregado/a
14	I did something fun with someone	Fiz alguma coisa divertida com alguém	Fiz alguma coisa divertida com alguém
15	I was bored for a lot of the time	Estive aborrecido grande parte do tempo	Estive aborrecido/a grande parte do tempo
16	I did something I really enjoy doing	Fiz algo que realmente me deu muito prazer	Fiz algo que realmente me deu muito prazer
17	I was worried about personal matters	Estive preocupado(a) com assuntos pessoais	Estive preocupado/a com assuntos pessoais
18	I learned something interesting	Aprendi algo interesante	Aprendi algo interessante
19	Things happened that made me really angry	Aconteceram coisas que me deixaram bastante nervoso(a)	Aconteceram coisas que me deixaram **realmente com raiva**

20	I gave myself a treat	Permiti um capricho a mim mesmo(a)	Permiti-me **um mimo/um agrado**
21	I felt disrespected by someone	Senti-me desrespeitado(a) por alguém	Senti-me desrespeitado/a por alguém

PHI – Pemberton Happiness Index

[1] Minor scale modifications conducted by the expert committee after the pretesting are highlighted in bold font.

Table 3. Characteristics of the study participants.

Characteristic	Sample 1 N=180	Sample 2 N=855	Total N=1.035
	N(%)	N(%)	N(%)
Gender			
Female	99 (55.0)	663 (77.5)	762 (73.6)
Male	81 (45.0)	192 (22.5)	273 (26.3)
Marital status			
Married	95 (52.8)	433 (50.6)	528 (51.0)
Widower	0 (0.0)	11 (1.3)	11 (1.1)
Separated	4 (2.2)	54 (6.3)	58 (5.6)
Single	79 (43.9)	355 (41.5)	434 (41.9)
Missing	2 (1.1)	2 (<1.0)	4 (<1.0)
Age (years)			
18-29	71 (37.6)	337 (39.4)	408 (39.4)
30-39	83 (43.9)	309 (36.1)	392 (37.9)
40-49	21 (11.1)	119 (13.9)	140 (13.5)
50-59	5 (2.6)	57 (6.7)	62 (6.0)
60-69	0 (0.0)	27 (3.2)	27 (2.6)
70-79	0(0.0)	4 (0.5)	4 (<1.0)
≥80	0 (0.0)	2 (0.2)	2 (<1.0)
Family income[1]			
<1	0	4 (0.5)	4 (<1.0)
1-2	10 (5.6)	60 (7.0)	70 (6.8)
2-3	20 (11.1)	66 (7.7)	86 (8.3)
3-5	42 (23.3)	172 (20.1)	214 (20.7)
5-10	31 (17.2)	257 (30.1)	288 (27.8)
10-20	18 (10.0)	192 (22.5)	210 (20.3)
>20	59 (32.8)	104 (12.2)	163 (15.7)
Origin (Brazilian region)			
Southeast	177 (98.3)	621 (72.5)	798 (77.1)
South	1 (0.6)	60 (7.0)	61 (5.9)
North	0	43 (5.0)	43 (4.2)
Northeast	2 (1.1)	62 (7.3)	64 (6.2)
Midwest	0	69 (8.1)	69 (6.7)
Years of formal education			
Less than 8	0 (0.0)	8 (0.9)	8 (<1.0)
8 to 11	4 (2.4)	82 (9.6)	86 (8.1)
More than 11	167 (97.6)	765 (89.4)	962 (91.0)
Profession			
Health professional	129 (71.6)	293 (34.2)	422 (40.7)
Manager	2 (1.1)	48 (5.6)	50 (4.8)
Unemployed	0 (0.0)	27 (3.1)	27 (2.6)
Entrepreneur	0 (0.0)	46 (5.3)	46 (4.4)
Engineer	0 (0.0)	30 (3.5)	30 (2.8)
Administrative tasks	17 (9.4)	36 (4.2)	53 (5.1)
Civil servant	0 (0.0)	104 (12.1)	104 (10.0)
Teacher	0 (0.0)	73 (8.5)	73 (7.0)
Student	15 (8.3)	112 (13.0)	127 (12.2)
Other	17 (9.4)	86 (10.0)	103 (9.9)

[1]Brazilian minimum wages.

Table 4. Mean scores and internal consistency values.

PHI item	Mean score (SD)	Cronbach's α, if item was excluded	Cronbach's α
I am very satisfied with my life.	6.92 (2.56)	0.898	-
I have the energy to accomplish my daily tasks.	6.67 (2.71)	0.901	-
I think my life is useful and worthwhile.	7.95 (2.65)	0.898	-
I am satisfied with myself	6.76 (2.66)	0.896	-
My life is full of learning experiences and challenges that make me grow.	7.71 (2.67)	0.902	-
I feel very connected to the people around me.	7.46 (2.68)	0.904	-
I feel able to solve the majority of my daily problems.	7.58 (2.23)	0.904	-
I think that I can be myself on the important things.	7.89 (2.31)	0.904	-
I enjoy a lot of little things every day.	6.79 (2.64)	0.907	-
I have a lot of bad moments in my daily life.	3.58 (2.93)	0.936	-
I think that I live in a society that lets me fully realize my potential.	4.99 (2.77)	0.917	-
PHI experiential score	4.35 (1.64)	NA	-
PHI remembered score (11 items)	7.01 (1.93)	-	0.914[1]
PHI total score (11 +1 items)	6.58 (1.71)	-	0.890[1]

NA=Not Applicable, PHI=Pemberton Happiness Index, SD=Standard Deviation

[1] Cronbach's α=0.890 (95%CI 0.890-0.900) when including the experiential score as a different item (11 + 1 items) and 0.914 (95% CI 0.906-0.922) when including only the 11 items from the remembered domain.

Table 5. Known-group validity

PHI score	Self-report of happiness Mean (SD)		p-value[1]	Self-report of optimism/pessimism			p-value[2]
	Happy (n=625)	Unhappy (n=230)		Optimistic (n=51)	Neither optimistic nor pessimistic (n=297)	Pessimistic (n=507)	
Remembered	7.38 (1.76)	5.46 (1.93)	<.001	7.48 (1.75)	6.14 (1.94)	5.00 (2.07)	<.001
Total	6.80 (1.60)	5.35 (1.74)	<.001	6.89 (1.57)	5.82 (1.79)	5.14 (1.78)	<.001

[1]T test. [2]ANOVA.

Table 6. Cramer's V between satisfaction with the events of the day before and the 10 items on experienced well-being (five negative and five positive) (n=96).

Experienced well-being items	**Cramer's V**	**p-value**
Positive experiences		
Something I did made me proud	0.305	.062
I did something fun with someone	0.436	.002
I did something I really enjoy doing	0.402	.002
I learned something interesting	0.338	.017
I gave myself a treat	0.338	.016
Negative experiences		
At times, I felt overwhelmed	0.376	.005
I was bored for a lot of the time	0.678	<.001
I was worried about personal matters	0.307	.047
Things happened that made me really angry	0.651	<.001
I felt disrespected by someone	0.395	.005

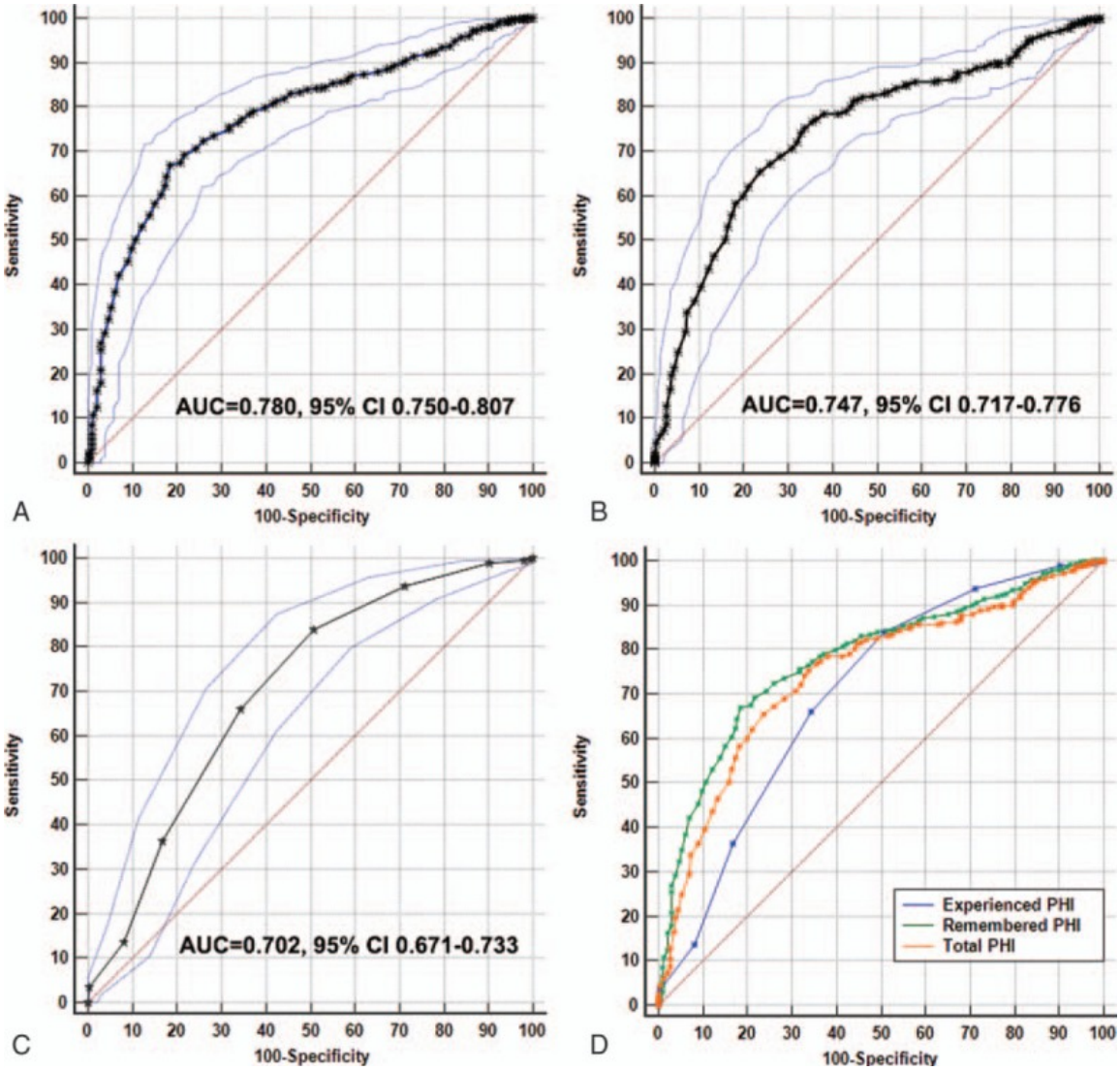

Figure 1. Discrimination of remembered PHI, experienced PHI, and total PHI scores. These receiver-operating characteristic (ROC) curves plot sensitivity versus 1-specificity for detecting individuals classified as happy: (A) remembered PHI score, (B) total PHI score, (C) experienced PHI score, (D) comparison between PHI scores. The area under the curve (AUC) values with 95% confidence intervals are shown in A–C. In D, experienced PHI (green) has the largest area under the curve compared to the other scores ($P < 0.001$ for both comparisons).

5 ARTIGO 2

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5.1 Predictors of happiness and satisfaction with life in a sample of individuals from the brazilian general population who use social networks

5.1.1 Abstract

Introduction: Happiness is a multidimensional and complex construct, mainly because it is a subjective individual experience. Literature has been trying to find "combinations" that can give people greater chances of happiness. **Objective:** To identify possible predictors of the perception of happiness and satisfaction with life in a sample of individuals from the Brazilian general population who use social networks. **Methods:** Cross-sectional study; participants were recruited in the five regions of Brazil through the Facebook and WhatsApp. Results: A total of 2,151 participants were included, some predictors of happiness and satisfaction with life were identified, which were mainly related to activities for social interaction and personal satisfaction. **Conclusion:** Being satisfied with financial circumstances, having a positive self-evaluation of health, having frequent family gatherings, engaging in physical activity ≥3 times a week, and not having a previous diagnosis of psychological/psychiatric problems are variables that "seem" to positively influence the perception of happiness.

5.2 Keywords

Happiness; Satisfaction With Life, Social Networks, Brazil.

5.3 Introduction

5.4 Materials and methods

Happiness is a desire of every human being, regardless of how she/he understands it, and is considered the primary goal of life; in order to achieve it, various paths have been tried (Rizvi & Hossain, 2017). Several studies have been conducted to understand the

process of the pursuit of happiness, many of these trying to find "combinations" of variables that may give people greater chances of happiness (Panadero, Guillen, & Vazquez, 2015; Ramirez de Arellano, 2014; Jo, Moon, Kim, & Nam, 2015; Weech-Maldonado, Miller, & Lord, 2017; Ngamaba & Soni, 2018; Liu et al., 2016).

Happiness is a multidimensional and complex construct, mainly because it is a subjective individual experience. Thus, it is challenging to compare data on happiness and its multidimensional measures between different cultures and specific populations (Sato et al., 2015). In recent years, happiness has gained increasing attention not only in academic literature but also in journalistic and political debates (Sabatini, 2014).

Happiness is closely associated with emotions, feelings, and moods, whereas satisfaction with life is connected to cognitive assessments and judgments about life, which may include assessments of various areas of life (Diener, Suh, Lucas, & Smith, 1999). Satisfaction with life is a congruence between the present and an ideal situation, both of which are a reflection of one's own subjective appreciation of one's life (Rabito-Alcon & Rodriguez-Molina, 2016). Thus, while happiness and satisfaction with life are closely related constructs, they must be evaluated as independent variables. In this study, the terms happiness and well-being/subjective well-being will be considered synonyms for better understanding and interpretation.

Besides subjective factors, contextual aspects could have some impact on happiness. Brazil has undergone a significant political and economic crisis, with notable popular dissatisfaction. In 2015, national popular movements began, culminating in 2016 with the impeachment of then-president-elect Dilma Roussef (Garcia, Calgaro, Matoso, Lis, & Rodrigues, 2016). Numerous relevant politicians in Brazil were investigated and convicted of corruption (Federal, 2018). Social media has been the scene of clashes and postings of political news, which are often untrue (i.e., “fake news”) (Gragnani, 2018).

The present study was conducted in this context of popular dissatisfaction in Brazil. The hypothesis of the study was that, despite existing in a context wherein people often use social networks for posting about dissatisfaction with violence and corruption, the variables associated with happiness and satisfaction with life are individual and related to healthy social interactions and simple everyday situations (such as leisure activities and contact with nature). Therefore, this study sought to identify possible correlates of happiness and satisfaction with life in a sample of individuals from the Brazilian general population.

5.4.1 Study Design

Cross-sectional study using an electronic tool for data collection.

5.4.2 Study participants

Individuals from the Brazilian general population who had an account on the Facebook social network and/or used the WhatsApp application.

5.4.3 Study site

Participants from the five regions of Brazil were recruited online through the Facebook social network and the WhatsApp application. The recruitment strategy is detailed in **Supplementary Material S1 [Tese, Anexo A]**. The survey was administered using the SurveyMonkey platform.

5.4.4 Eligibility criteria

Individuals who fulfilled all inclusion criteria and no exclusion criteria were included.

Inclusion criteria - Brazilian nationality, residing in a Brazilian municipality, having an account in the Facebook social network and/or the WhatsApp application.

Exclusion criteria - Under 18 years of age.

5.4.5 Sample size calculation

The sample size calculation considered a priori a coefficient of determination (effect size) of $R2=0.01$ in a multiple linear regression model with seven predictors and a level of significance (or Type I error) of $\alpha=0.05$ and Type II error of $\beta=0.05$, thereby resulting in an a priori statistical power of 95%. Inputting the values described above in the application Power Analysis and Sample Size (PASS), 2002 version, yielded a sample size of 2,191 subjects.

5.4.6 Ethical aspects

Participants read the informed consent form online before signing and authorizing their voluntary participation. The study was approved by the Research Ethics Committee of the Barretos Cancer Hospital under opinion no. 1.098.789. The study was conducted in accordance with the principles expressed in the Declaration of Helsinki.

5.4.7 Data collection instruments

5.4.7.1 Sociodemographic and clinical questionnaire and issues potentially associated with the feeling of happiness

For the development of this questionnaire, the items were defined after meetings among researchers from the Palliative Care and Quality of Life Research Group (GPQual) and were based on a literature review and discussions about potential factors related to happiness. Before proceeding to the main data collection, the first 50 individuals who completed the questionnaire had their answers checked in order to assess for accuracy, the frequency of missing items, and verification of SurveyMonkey's functioning. The questionnaire included sociodemographic characterization data, such as age, sex, marital status, religion, and demographic region, as well as clinical characterization data, such as personal perception of health and previously diagnosed health problems. Several items addressed issues potentially associated with the perception of happiness (**Supplementary Material S2 [Tese, Anexo B])**.

5.4.7.2 Pemberton Happiness Index (PHI-r)

This measure is composed of eleven items related to different areas of remembered well-being (General, Hedonic, Eudaimonic, and Social Well-Being) and ten items related to recently experienced well-being (previous day's events). The items are answered on a Likert scale, and the higher the scores, the greater the happiness. The sum of the scores produces a combined well-being index (PHI-total) (Hervas and Vazquez, 2013). The Portuguese version is valid and reliable for use in the Brazilian population through online surveys (Paiva et al., 2016). In the present study, the PHI-remembered score (PHI-r), with a cut-off score of 7, was used to define happiness, according to a validation study in Brazil (Paiva, et al., 2016). Cronbach's α value was 0.877.

5.4.7.3 Satisfaction with Life Scale (SWLS)

This instrument consists of five items that evaluate a cognitive component of life satisfaction, and participants answer it on a seven-point scale, ranging from 1 (totally disagree) to 7 (totally agree). In the Brazilian validation, the scale presented with Cronbach's α value of 0.89 (Gouveia, Barbosa, Andrade, & Carneiro, 2005). It is the most widely used

scale for assessing overall satisfaction with life and has been implemented in several languages and cultures, providing good psychometric indexes (Hutz, 2014; W. Pavot, Diener, Colvin, & Sandvik, 1991). In the present study, Cronbach's α value was 0.873.

5.4.8 Statistical Analysis

The sample was described using absolute and relative frequencies. The normality of the data was tested using the Kolmogorov-Smirnov test. The Mann-Whitney or Kruskal-Wallis chi-square and Fisher's exact tests were used to analyze the relationship of the instruments with the variables (univariate analysis) and to compare the scores between the groups. For the multivariate analysis, logistic regression models (dichotomous independent variable) and linear (continuous independent variable) were fitted. A significance level of 5% was adopted for the tests, and the analyses were performed using SPSS v.21.0.

To create decision rules for discriminating between the two groups (PHI ≥7 vs. PHI <7), we fitted a model using the decision tree technique, using the CHAID method (Magidson, 1993).

5.5 Results

The study included 2,151 participants representing the Brazilian general population. The majority were female (n=1,672, 77.7%), white (n=1,509, 70.2%), aged 18 to 29 years (n=940, 43.7%), married (n=1,020, 47.4%), and having completed more than 11 years of schooling (n=1,891, 87.9%). The majority resided in the Southeast region of the country (n=989, 46.0%) and lived in urban areas (n=2,096, 97.4%). **Table 1** shows the sociodemographic characteristics of the participants.

Univariate analyses were performed for each of the instruments used (PHI-r and SWLS). Variables with p-values <0.05 were included in linear regression and multiple logistic models, which were adjusted for age, gender, income, and schooling. The detailed results of the univariate analyses are found in the supplemental materials (**Supplementary Table S1, S2 and S3 [Tese, Anexos C, D e E])**.

5.5.1 Pemberton Happiness Index (PHI-r)

In the multiple linear regression model (considering PHI as a continuous variable), being between 50 and 59 years old (β=0.6, p=<0.001) and residing in the North (β=0.5,

p=<0.001) and South (β=0.5, p=<0.001) regions of the country were associated with higher happiness scores and positive self-rated health (β=0.9, p=<0.001), satisfaction with financial circumstances (β=0.7, p=<0.001), and influence of spiritual/religious life (β=0.4, p=<0.001). Regarding the daily lives of the participants, a higher frequency of family gatherings (β=0.4, p=<0.001) and time for leisure (β=0.5, p=<0.001), as well as practicing physical activity ≥3 times per week (β=0.4, p=<0.001), were associated with higher PHI-r scores. In contrast, previous diagnosis of psychological/psychiatric problems (β=-0.8, p=<0.001) and being unemployed (β=-0.8, p=<0.001) were negatively associated with participants' happiness scores (**Table 2**).

A multiple logistic regression analysis was also performed with dichotomized PHI-r (happy vs. not happy) as the independent variable. Age between 50 and 59 years (odds ratio [OR]=2.4, p=<0.001) and residing in the South region (OR=1.9, p=<0.001) of the country were also associated with higher levels of happiness, as well as satisfaction with financial circumstances (OR=2.7, p=<0.001), positive self-rated health (OR=2.3, p=<0.001), influence of spiritual/religious life (OR=1.8, p=<0.001) (OR=1.7, p=<0.001), and engaging in physical activity ≥3 times per week (OR=1.8, p=<0.001). Having a previous diagnosis of psychological/psychiatric problems (OR= 0.4, p=<0.001) and being female (OR=0.7, p=<0.005) were negatively associated with happiness scores (**Table 3**).

5.5.2 Satisfaction with Life Scale (SWLS)

In the multiple linear regression model, higher satisfaction with life was associated with satisfaction with financial circumstances (β=3.5, p=<0.001), happiness with work (β=3.1, p=<0.001), positive self-rated health (β=3.0, p=<0.001), time for leisure (β=1.6, p=<0.001), frequency of family gatherings (β=1.3, p=<0.001), family income (β=1.5, p=<0.001), spiritual/religious influence (β=1.1, p=<0.001), engaging in physical activity ≥3 times per week (β=0.6, p=0.024) and volunteer work (β=0.7, p=0.019). Being unemployed (β=-2.7, p=0.046) and having a previous diagnosis of psychological/psychiatric problems (β=-2.3, p=<0.001) were negatively associated with the participants' satisfaction with life (**Table 4**).

5.5.3 Decision Tree Model

A tool was also generated through the decision tree technique using the CHAID method (Magidson, 1993) to discriminate between two groups according to the PHI-r (happy vs. not happy).

The decision tree model generated simple decision rules to discriminate between groups with their respective probabilities of correct discrimination. This type of model can be particularly useful for rapid assessment. Among the variables, five remained as the most important: satisfaction with financial circumstances, health self-assessment, previous diagnosis of psychological/psychiatric problems, frequency of family gatherings, and engagement in physical activity (**Table 5**).

The 5 important variables that remained in the decision tree model also stood out in the linear regression and logistics analyses, in that all had an influence on satisfaction with life (SWL) and the perception of happiness (PHI-r) (**Table 6**).

5.6 Discussion

This study aimed to identify possible predictors of the perception of happiness and satisfaction with life in a sample of individuals from the Brazilian general population who use social networks. A set of variables that positively influence the feeling of happiness and satisfaction with life were found, which included satisfaction with financial circumstances, health self-assessment, previous diagnosis of psychological/psychiatric problems, frequency of family gatherings, and engagement in physical activity.

5.6.1 Main findings

Regarding the sociodemographic variables, gender and age deserve mention. Gender is a sociodemographic variable that has been associated with inconsistent findings in the literature regarding happiness, since it can be influenced by social origins and the cultural contexts of each country (Moriyama, Tamiya, Kawachi, & Miyairi, 2018; Weech-Maldonado et al., 2017). Some of the differences related to satisfaction with life may be due to the different weights attributed by men and women to different dimensions of life, such as occupational, social, health, or housing factors (Della Giusta, Jewell, & Kambhampati, 2011).

The relationship between age and happiness has also been investigated, and the distribution of levels of happiness has been depicted as a U-shaped curve. This indicates that

younger and older adults tend to have higher levels happiness compared to middle-aged adults (Blanchflower & Oswald, 2008; Tiefenbach & Kohlbacher, 2013). In the present study, more than 75% of participants were between 18 and 39 years of age. According to the results, individuals between the ages of 40 and 70 reported being happier compared to younger people. Analysis of individuals over 70 years old was hampered by the small number of participants in this stratum.

In this study, having a job and being happy with it were important factors in the happiness and satisfaction with life of the participants. Consistent with this finding, positive associations have been found between being employed and happiness indexes (Raymo, 2015; Mehrdadi, Sadeghian, Direkvand-Moghadam, & Hashemian, 2016). In addition, job satisfaction has been strongly correlated, among other things, with happiness and satisfaction with life (Bruk-Lee, Khoury, Nixon, Goh, & Spector, 2009; Satuf et al., 2018). Moreover, the chances of a person reporting happiness may be greater if the individual evaluates the nature of their work positively (Satuf et al., 2018). This is because, likely for many individuals, work also contributes to the development of identity and because the assessment of work can have an impact on other spheres of life (Russell, 2008).

Although several studies provide evidence of an association between volunteer work and increased levels of happiness (Dulin, Gavala, Stephens, Kostick, & McDonald, 2012; Michele et al., 2017; Mui, Glajchen, Chen, & Sun, 2013; Tse, 2018), these effects have greater meaning for older adults compared to younger groups (Kim & Pai, 2010; Huang, 2018) and the positive influences on happiness are greater in those with lower socioeconomic status (Morrow-Howell, Hong, & Tang, 2009; Dulin et al., 2012). Being involved in some type of volunteer activity in this study was associated with satisfaction with life but not with happiness scores, which may be explained by the fact that most of the participants were young, with high levels of schooling and income.

Leisure activities were associated with both happiness and satisfaction with life. In addition to facilitating moments of relaxation, leisure activities often provide for social interactions, which are positively conducive to happiness and satisfaction with life (Milyavskaya & Koestner, 2011; Hart et al., 2018; Leversen, Danielsen, Birkeland, & Samdal, 2012; Cha, 2018; Adams, Leibbrandt, & Moon, 2011).

Another form of social interaction are family relations, since these are fundamental to provide, among others things, financial and emotional support and, consequently, social and

psychological support (Chiang & Lee, 2018). The quest for family harmony is considered an important purpose of life that is also essential for maintaining the happiness of individuals regardless of culture and age group (Glaw, Kable, Hazelton, & Inder, 2017). There is evidence of an association between positive family relations and happiness (Raymo, 2015; Chiang & Lee, 2018). The frequency of family gatherings (e.g., family lunches or dinners) was positively associated with happiness and life satisfaction and was also an important item in the decision tree. A previous study showed that having companionship during meals was associated with higher happiness scores (Lobos, Lapo Mdel, & Schnettler, 2016).

A very widespread issue in Western society is whether "money brings happiness." Our results show that, although family income was associated with higher satisfaction with life, personal satisfaction with the money received tended to be more relevant, as it was positively associated with happiness and satisfaction with life; it also was one of the items present in the decision tree. How much money the individual alone earns does not predict satisfaction in other areas of life (Rojas, 2011; Weech-Maldonado et al., 2017). Therefore, it is possible to find happy people with very low incomes, which could explain why they experience great satisfaction in other areas of their lives (Panadero et al., 2015; Vázquez, 2013). However, it is known that there is a positive relationship between family financial satisfaction and happiness (Ngamaba & Soni, 2018). Although money cannot buy happiness, it can, for example, make health care accessible, especially in regions with exacerbated socioeconomic inequalities and scarce healthcare resources (Adesanya, Rojas, Darboe, & Beogo, 2017). Therefore, the transition from poverty to moderate income is fundamental for a family to meet its basic needs (Biswas-Diener & Diener, 2001). After meeting basic needs, however, the additional income does not serve deeper needs in a lasting way, at least when it is directed toward acquiring more material goods (North, Holahan, Moos, & Cronkite, 2008). Experiential purchases (such as vacations, travel, concerts, and meals away from home) tend to bring more lasting happiness than material purchases. This is because, compared to material goods, experiences are less prone to hedonic adaptation (Gilovich & Kumar, 2015).

Health self-assessment, also called self-reported health, has been positively associated with happiness (Chiang & Lee, 2018; Panadero et al., 2015; Ramirez de Arellano, 2014; Jo et al., 2015; Ngamaba & Soni, 2018), even after the results of studies are controlled by relevant socioeconomic phenomena (Panadero et al., 2015; Sabatini, 2014; Adesanya et al., 2017). In

the present study, health self-assessment was shown to influence happiness and satisfaction with life scores and to be a relevant item in the decision tree. What matters in the self-assessment of health, which is a subjective assessment of the individual, is her/his feeling of being in good or poor health, regardless of the actual number of illnesses present (Panadero et al., 2015; Ramirez de Arellano, 2014; Matlin, 1966).

Scientific evidence indicates that the practice of physical activity is also positively correlated with happiness scores (Lathia, Sandstrom, Mascolo, & Rentfrow, 2017; Maher et al., 2013; Matheson, 2014) and that individuals are happier at times when they are more physically active (Lathia et al., 2017). Such momentary happiness could be related to underlying social interactions, as there are reports of more positive affects when individuals are in social situations (William Pavot, Diener, & Fujita, 1990). Physical activity is also probably linked to happiness by internal processes, as it provides a revitalizing effect, which can increase the availability of resources for the pursuit of personal goals (Kanning & Schlicht, 2010). In this study, practicing physical activity more than 3 times a week was associated with happiness and satisfaction with life and was one of the relevant items in the decision tree.

Being happy is not necessarily the opposite of being depressed. In any case, it seems natural to assume that happiness is negatively associated with negative emotional traits (Sato, et al., 2015), as well as other mental disorders (Touburg & Veenhoven, 2015). Average happiness seems to be higher in countries that invest more in mental health, both in absolute terms (more mental health professionals) and relative terms (share of investment in mental health care in the total health budget), especially in developed nations (Touburg & Veenhoven, 2015). Our results corroborate with previous studies that showed that diagnoses of depression or anxiety are associated with lower levels of happiness (Liu et al., 2016; Maher et al., 2013). Likewise, satisfaction with life was also strongly influenced by mental health (Lombardo, Jones, Wang, Shen, & Goldner, 2018; Layard, Chisholm, Patel, & Saxena, 2013).

Spirituality/religiosity (S/R) was another important factor in the happiness and satisfaction with life of the participants from the Brazilian general population. The relationship between S/R and satisfaction with life has been found to be positive (Lim & Putnam, 2010; Doolittle, Courtney, & Jasien, 2015). Scientific evidence suggests that individuals who regularly attend religious institutions build social networks but that the

effect of the social relations arising from such encounters is contingent on the presence of a strong religious identity (Lim & Putnam, 2010); moreover, there may be differences in the experience of happiness and satisfaction with life in different spiritual/religious groups (Ngamaba & Soni, 2018). At the same time, S/R is a means by which to achieve purpose in life, to improve mental health, to establish well-being and to gain inner peace, which can lead to happiness (Rizvi & Hossain, 2017).

5.7 Limitations of the study

This study had some limitations. The participants were recruited only through social networks (Facebook and WhatsApp), which can contribute to internet access bias because not all Brazilians have online access. The spontaneous interest in the subject may serve as another selection bias insofar as the individuals were free to participate when receiving the invitation through the social network. The discrepancy in the number of respondents of the female gender promoted another limitation, besides the inequality in the number of participants by region of the country, although all the brazilian regions were represented.

5.8 Strengths and practical perspectives

This study benefits from strengths with regard to its originality—namely, in Brazil, there has been no other study to evaluate the predictors studied—and the large number of its participants, all of the same nationality while residing in different regions. Once the relevant predictors have been identified, it is possible to stimulate increases in their frequencies of occurrence in the daily life of Brazilians, in an attempt to raise individual levels of happiness and satisfaction with life.

In individuals with a history of psychological/psychiatric disorders, therapeutic strategies focused on improving self-perceived health, as well as cognitive adjustment regarding expectations of financial gain (i.e., satisfaction with financial circumstances) may be important for the individual perception of happiness. Encouraging individuals to seek closeness with family members can also be helpful in this context. However, these therapeutic strategies need to be delineated and tested in future studies.

5.9 Conclusions

The initial hypothesis of the study was confirmed, reinforcing that, although there is great dissatisfaction with violence and corruption in the current Brazilian context, the variables associated with happiness and satisfaction with life are individual and related to healthy social interactions and simple everyday situations.

A set of variables predicted the perception of happiness and satisfaction with life of a sample of individuals from the general Brazilian population using social networks. Being satisfied with financial circumstances, having a positive perception in one's self-evaluation of health, having frequent family gatherings, engaging in physical activities ≥3 times a week, and not having a previous diagnosis of psychological/psychiatric problems are variables that "seem" to influence, in a positive way, the perception of happiness.

The decision tree model is simple and easy to interpret, and it can offer a convenient application in clinical practice to identify possible risks for unhappiness and preventive actions against these risks.

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Table 1. Demographic and socio-demographic characteristics of participants (n=2151).

Characteristics	**n**	**%**
Gender		
Male	479	22.3
Female	1672	77.7
Race		
White	1509	70.2
Black	86	4.0
Latino	484	22.5
Asian	55	2.5
Missing	17	0.8
Age (years)		
18-29	940	43.7
30-39	703	32.7
40-49	288	13.4
50-59	156	7.3
60-69	52	2.4
≥70	12	0.6
Marital Status		
Married or live married	1020	47.4
Windowed	30	1.4
Separated or divorced	129	6.0
Single	960	44.6
Other/Don't know	12	0.6
Region where live		
North	174	8.1
Northeast	240	11.2
Southeast	989	46.0
Midwest	182	8.5
South	566	26.3
Location where live		
Urban area	2096	97.4
Rural area	55	2.6
Educational level		
<8 years	35	1.6
8 a 11 years	223	10.4
>11 years	1891	87.9
Missing	02	0.1
Has current professional activity		
Yes	2068	96.1
No	83	3.9
Family income*		
≤3.9 minimum wages	435	20.2
≥4 minimum wages	1716	79.8
Has any religion		
Catholic	1073	49.9
Evangelic	340	15.8
Spiritist	394	18.3
Outher	25	1.2
No formal religion	313	14.6
Atheist/Agnostic	06	0.3

*Brazilian minimum wage

Table 2. Multiple linear regression for the evaluation of happiness-related characteristics measured by the Pemberton Happiness Index (PHI-r) (n=2151).

Variables	β (SE)	Expo(B)	95% CI	p-Value
Constant	4.9 (0.1)	-	4.7 - 5.2	<0.001
Age (years)				
18-29	-	-	-	-
30-39	0.1 (0.1)	0.0	-0.1 - 0.2	0.315
40-49	0.3 (0.1)	0.0	0.0 - 0.5	0.015
50-59	0.6 (0.1)	0.1	0.3 - 0.9	<0.001
60-69	0.6 (0.2)	0.0	0.1 - 1.0	0.019
≥70	0.5 (0.5)	0.0	-0.5 - 1.4	0.312
Country region of residence				
Southeast	-	-	-	-
Center-West	0.0 (0.1)	0.0	-0.3 - 0.3	0.986
Northeast	0.3 (0.1)	0.0	0.0 - 0.5	0.021
North	0.5 (0.1)	0.1	0.3 - 0.8	<0.001
South	0.5 (0.1)	0.1	0.3 - 0.6	<0.001
Employed				
Yes	-	-	-	-
No	-0.8 (0.2)	-0.1	-1.2 - (-0.4)	<0.001
Satisfaction with financial circumstances				
Very much[1]	-	-	-	-
Little[2]	0.7 (0.1)	0.2	0.6 - 0.9	<0.001
Self-assessed health				
Poor[3]	-	-	-	-
Good[4]	0.9 (0.1)	1.8	1.4 - 2.5	<0.001
Prior psychological/psychiatric diagnosis				
No	-	-	-	-
Yes	-0.8 (0.1)	-0.2	-0.9 - (-0.6)	<0.001
Frequency of family gatherings				
Little[5]	-	-	-	-
Very frequent[6]	0.4 (0.1)	0.1	0.3 - 0.6	<0.001
Influence of religious or spiritual life on happiness				
Little[1]	-	-	-	-
Very much[2]	0.4 (0.1)	0.1	0.3 - 0.6	<0.001
Leisure time				
Little[1]	-	-	-	-
Very much[2]	0.5 (0.1)	0.1	0.3 - 0.6	<0.001
Physical activity				
Does not engaged in physical activity	-	-	-	-
1 to 2 times per week	0.1 (0.1)	0.0	-0.1 - 0.3	0.403
3 or more times per week	0.4 (0.1)	0.1	0.2 - 0.6	<0.001

Model adjusted for the following variables: age, gender, family income and education level (R^2=0.266).
[1]no/very little/more or less. [2]very much/extreme. [3]very poor/poor/neither poor nor good.
[4]good/very good. [5]no/very little/more or less. [6]often/always.

Table 3. Logistic regression for the evaluation of happiness-associated characteristics measured by the dichotomized Pemberton Happiness Index (PHI-r) (n=2151).

Variables	OR	95% CI	p-Value
Constant	0.3	-	<0.001
Gender			
Male	-	-	-
Female	0.7	0.5 - 0.9	0.005
Age (years)			
18-29	1.0 (Reference)		
30-39	1.1	0.9 - 1.3	0.513
40-49	1.7	1.2 - 2.3	0.002
50-59	2.4	1.6 - 3.8	<0.001
60-69	1.9	0.9 - 4.1	0.057
≥70	1.5	0.4 - 6.0	0.544
Region of the country in which you reside			
Southeast	1.0 (Reference)		
North	1.7	1.2 - 2.5	0.004
Northeast	1.4	1.0 - 2.0	0.034
Center-West	1.1	0.8 - 1.6	0.458
South	1.9	1.5 - 2.4	<0.001
Satisfaction with financial circumstances			
Little[1]	-	-	-
Very much[2]	2.7	2.1 - 3.4	<0.001
Influence of religious or spiritual life on happiness			
Little[1]	-	-	-
Very much[2]	1.8	1.5 - 2.2	<0.001
Self-assessed health			
Poor[3]	-	-	-
Good[4]	2.3	1.7 - 3.1	<0.001
Prior psychological/psychiatric diagnosis			
No	-	-	-
Yes	0.4	0.3 - 0.5	<0.001
Frequency of family gatherings			
Little[5]	-	-	-
Very frequent[6]	1.7	1.4 - 2.1	<0.001
Physical activity			
Do not engage in physical activity	1.0 (Reference)		
1 to 2 times per week	1.0	0.8 - 1.3	0.833
3 or more times per week	1.8	1.4 - 2.2	<0.001

Model adjusted for the following variables: age, gender, family income and education level (R^2=0.267). [1]no/very little/more or less. [2]very much/extreme. [3]very poor/poor/neither poor nor good. [4]good/very good. [5]no/very little/more or less. [6]often/always.

Table 4. Multiple linear regression for the evaluation of characteristics associated with life satisfaction, measured by the Satisfaction with Life Scale (SWLS) (n=2151).

Variables	β (SE)	Expo (B)	95% CI	p-Value
Constant	16.1 (0.5)	-	15.1 - 16.9	<0.001
Employed				
Yes	-		-	-
No	-2.7 (1.4)	0.0	-5.4 - (-0.1)	0.046
Family income				
≤3.9x minimum wages	-		-	-
≥4x minimum wages	1.5 (0.3)	0.1	0.8 - 2.1	<0.001
Volunteer work				
No	-		-	-
Yes	0.7 (0.3)	0.0	0.1 - 1.2	0.019
Satisfaction with financial circumstances				
Little[1]	-		-	-
Very much[2]	3.5 (0.3)	0.2	2.9 - 4.0	<0.001
Self-assessed health				
Poor[3]	-		-	-
Good[4]	3.0 (0.4)	0.1	2.3 - 3.7	<0.001
Prior psychological/psychiatric diagnosis				
No	-		-	-
Yes	-2.3 (0.3)	-0.1	-2.9 - (-1.8)	<0.001
Frequency of family reunions				
Little[5]	-		-	-
Very frequent[6]	1.3 (0.2)	0.1	0.8 - 1.8	<0.001
Influence of religious or spiritual life on happiness				
Little[1]	-		-	-
Very much[2]	1.1 (0.2)	0.1	0.6 - 1.6	<0.001
Leisure time				
Little[1]	-		-	-
Very much[2]	1.6 (0.3)	0.1	1.1 - 2.2	<0.001
Happiness with work				
Little[1]	-		-	-
Very much[2]	3.1 (0.2)	0.2	2.6 - 3.6	<0.001
Physical activity				
Does not engage in physical activity	-		-	-
1 to 2 times per week	0.3 (0.3)	0.0	-0.3 - 0.9	0.376
3 or more times per week	0.6 (0.3)	0.0	0.1 - 1.2	0.024

Model adjusted for the following variables: age, gender family income and education level (R^2=0.362).
[1]no/very little/more or less. [2]very much/extreme. [3]very poor/poor/neither poor nor good. [4]good/very good. [5]no/very little/more or less. [6]often/always.

Table 5. Decision tree model with simple decision rules (considering the studied variables) to discriminate between the groups and their respective probabilities of being considered happy or unhappy**.**

Variables	**Unhappy (PHI <7)**	**Unhappy (PHI <7)**	**Happy (PHI ≥7)**	**Happy (PHI ≥7)**	**Happy (PHI ≥7)**	**Happy (PHI ≥7)**	**Happy (PHI ≥7)**
Satisfaction with Financial Circumstances	Little[1]	Little[1]	Little[1]	Little[1]	Very much[2]	Very much[2]	Very much[2]
	And	And	And	And	And	And	And
Previous Psychiatric/Psychological Diagnosis	Yes	Yes	No	No	Yes	No	No
	And	And					
Self-Assessed Health	Poor[3]	Good[4]					
			And	And			
Frequency of Family Gatherings			Little[5]	Very frequent[6]			
						And	And
Practice of Physical Activity						0 to 2 times/week	≥3 times/week
Probability of Correct Prediction	**90%**	**58.8%**	**50.2%**	**65.9%**	**68.9%**	**77.9%**	**86.4%**

[1]no/very little/more or less. [2]very/extremely. [3]very poor/poor/neither poor nor good. [4]good/very good. [5]no/very little/more or less. [6]often/always

Table 6. Influence of variables on the happiness and satisfaction with life scores.

Variables	**Happiness[1]**			**Satisfaction with Life[2]**
	Dic[3]	**Cont[4]**	**Tree[5]**	
Satisfaction with financial circumstances	+	+	+	+
Self-assessed health	+	+	+	+
Engagement in physical activity	+	+	+	+
Frequency of family gatherings	+	+	+	+
Prior psychological/psychiatric diagnosis	+	+	+	+
Spirituality/Religiosity	+	+	-	+
Age	+	+	-	-
Employed	-	+	-	+
Region of residence	+	+	-	-
Leisure activities	-	+	-	+
Gender	+	-	-	-
Family income	-	-	-	+
Volunteer work	-	-	-	+
Happiness with work	-	-	-	+

[1]PHI-r. [2]Satisfaction with Life Scale. [3]Dichotomous variable (yes/no). [4]Continuous variable.
[5]Result of the decision tree using PHI-r as a dichotomous variable.

6 ARTIGO 3

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6.1 The impact of the cancer experience on the perception of happiness of patients and caregivers: a cross-sectional study

6.1.1 Abstract

Background: Although cancer patients have distressing symptoms and even health-related changes in their quality of life, they also report positive emotional states. Informal caregivers of cancer patients may also have their lives affected by cancer diagnosis, however, may also find benefits in these experiences. Noticeable changes are reported in the priorities of personal values after an oncologic diagnosis, which can cause important changes and lead individuals to restructure their values and the way they perceive life. This study aims to assess happiness/satisfaction with life and positive and negative affects in cancer patients and informal caregivers compared with healthy people in the general population. **Methods:** A cross-sectional study with participants recruited online in five regions of Brazil through the social network site Facebook® and the application WhatsApp®. The survey was answered using the SurveyMonkey® platform. A different sample of cancer patients and informal caregivers, personally interviewed with the same forms, was grouped in the present analysis. Variables with p-values <0.05 in univariate analysis were included in linear regression models (stepwise, backward). **Results:** A total of 2,580 participants were included, of which 2,112 were representatives healthy of the general population, 342 were cancer patients and 126 were informal caregivers of cancer patients. In the multivariate analysis, cancer patients and informal caregivers were happier compared with healthy people in the general population, even after controlled by age, sex, educational, and income. Patients and caregivers had lower scores on positive affects and higher scores on negative affects. **Conclusions:** Overall, the conditions related to happiness, satisfaction with life and positive affects are similar for

all groups. However, cancer patients and informal caregivers report increased rates of happiness and satisfaction with life compared with theoretically healthy people, although they have lower positive affect scores and higher negative affect scores. It is suggested that cancer patients and caregivers of cancer patients are experiencing more difficulties (suffering) on a daily basis. However, given the increased difficulties, they perceive life differently, reporting that they are happier.

6.2 Keywords

Caregivers; Cancer, Happiness; Subjective well-being; Health Surveys; Patients; Personal Satisfaction.

6.3 Introduction

The definitions of happiness are diverse; yet, most relate it to a multidimensional construct or a positive emotional state with feelings of well-being. Happiness can be considered synonymous with subjective well-being and satisfaction with life[1, 2]. Happiness is an internal experience from which each individual issues a judgment about his or her life and how and why he or she experiences it positively[2-4]. It is a consensus that regardless of how happiness is understood, the human being is always in search of it[4]. Happiness indexes are also used as indicators of economic growth and social development in several countries, influencing the implementation of public policies[5]. Moreover, it is considered a basic human goal by the United Nations[6].

Cancer is one of the diseases most feared by society due to the stigma of suffering from its physical, emotional, social and spiritual effects. Although patients present with distressing symptoms associated with disease progression and even changes in health-related quality of life (HRQOL), they also report positive emotional states[2, 7, 8]. Caregivers of cancer patients may also have their lives affected by the cancer diagnosis[9-11] because they help patients deal with functional, clinical, and psychosocial issues[12]. All of these factors can play a critical role in their mental health and quality of life[13, 14]. However, caregivers may also find upsides in these experiences, which may be associated with better outcomes in well-being and happiness[15-17].

Considering that the cancer diagnosis is the beginning of an unknown journey, the path of this threatening experience can be marked by severe physical and emotional

traumas[7, 8]. However, there are different ways of responding to the stressful nature of the cancer experience[18]. From a psychological point of view, cancer can be considered a psychosocial transition with potential for positive and negative changes[19]. Perceptible changes are reported in personal values priorities after a cancer diagnosis, which can cause important changes and lead individuals to restructure their values and the way they perceive life[20, 21]. One question worthy of further study is the relation between current suffering and the perception of happiness/life satisfaction. Individuals suffering from a life-threatening disease, such as cancer, can be happy? On the other hand, does the absence of negative affects imply happiness? Aware of the suffering caused by cancer and the possibility of posttraumatic growth with possible change in the perception of life, the aim of this study was to evaluate the happiness/life satisfaction as well as the positive and negative affects in cancer patients and informal caregivers of cancer patients compared with healthy people in the general population.

With a focus on positive psychology, our main hypothesis was that cancer patients, as well as informal caregivers of cancer patients, should report equal or higher levels of happiness and life satisfaction when compared with healthy people, even reporting higher levels of negative affects. In addition, patients who have faced cancer and believe that they have eliminated it (such as cancer survivors), as well as patients who are 4 currently facing cancer with a real chance of overcoming it (undergoing adjuvant chemotherapy) should report higher levels of happiness and satisfaction with life when compared with patients with no possibility of cure (palliative care only).

6.4 Methods

6.4.1 Study Design

A pooled analysis of two cross-sectional samples: (1) social media healthy users that completed surveys using electronic tools; (2) cancer patients and informal caregivers of cancer patients that answered face-to-face questionnaires.

6.4.2 Study participants

Individuals who have a Facebook® account and/or used the WhatsApp® application, and caregivers of cancer patients and cancer patients treated at a cancer hospital.

6.4.3 Study site

Participants from the five regions of Brazil were recruited online through the social network site Facebook® and the WhatsApp® application. In brief, three different strategies were used for the Facebook® survey: (1) From a total of 5,570 Brazilian cities, 300 of them were randomly selected. One of the researchers (MCG) searched for Facebook® pages that could be representative of the city (preferentially official prefectures pages) and requested permission from the owners of that pages to post the link of the survey; (2) three university professors from the northeast, northern and southern Brazilian regions were invited to post the research link on their personal Facebook® pages; (3) the authors posted the link on their personal pages. Additionally, some contacts from the authors were also contacted through the WhatsApp® application. In this case, an explanatory text about the study was sent together with the research link. In addition to being asked to respond to the questionnaire online (using both Facebook® or WhatsApp®), they were encouraged to share the study text/link with their own Facebook® and WhatsApp® contacts. The survey was answered using the SurveyMonkey® platform. Unfortunately, since the data collector used for the survey was the same in all the methodologies, it was not possible to identify accurately the most effective survey strategy.

A convenience sample of cancer patients and informal caregivers was interviewed in person using the same evaluation forms answered online. Three trained interviewers (two research nurses and one medical student) collected all the data. Patients were recruited at the oncology outpatient clinics and caregivers at two different institutional support houses, where cancer patients and informal caregivers from other locations stay while being treated in the city of Barretos.

6.4.4 Eligibility criteria

Individuals who met all inclusion criteria and no exclusion criteria were included.

General population participants: Inclusion criteria – Individuals of Brazilian nationality, residing in the various Brazilian municipalities, who had a Facebook® account and/or used the WhatsApp® application. Exclusion criteria - Under 18 years old.

Informal caregivers of cancer patient (people who were accompanying cancer patients at the time of the interview, being familiar or not): Inclusion criteria – Individuals of Brazilian nationality, aged ≥ 18 years, who accompanied a cancer patient during their

treatment/follow-up at the cancer hospital and who could read and write. Exclusion criteria - Any relevant neuropsychiatric condition that would prevent the patient from understanding and answering health questionnaires (according to the investigator).

Cancer patients: Inclusion criteria – Individuals with a histological diagnosis of cancer of any histology or clinical stage, age between 18 and 75 years old, any sex, who could read and write and were in one of the following treatment stages: no evidence of disease and no cancer treatment for at least 2 years; under systemic adjuvant treatment; and under exclusive palliative care. Exclusion criteria - Any relevant neuropsychiatric condition that would prevent the patient from understanding and answering health questionnaires and patients with hematological tumors. Neuropathological issues were identified by evaluation of medical charts and as per investigator's evaluation. No screening instrument for cognitive impairment was used. With regards to the hematological cancers, they were excluded because of logistical questions, since in the hospital hematological cancer patients are treated in a different part of the hospital.

6.4.5 Sample size calculation

The sample size was calculated using the Power Analysis and Sample Size application (PASS v. 2002) via multiple linear regression analysis with seven predictors and *a priori* coefficient of determination (effect size) of $R2=0.01$, $\alpha=0.05$ and $\beta=0.05$, thus resulting in an *a priori* statistical power of 95%. The estimated sample size was 2,191 healthy participants.

Samples with cancer patients and caregivers of cancer patients were grouped in the present study. The sample size of them was calculated in a separate study that aimed to compare happiness levels according to different subgroups of patients: (1) survivors (no evidence of disease and no antineoplastic treatment); (2) adjuvant therapy (no evidence of disease but under antineoplastic treatment); (3) palliative care only (evidence of disease and no antineoplastic treatment). Thus, assuming a rate of 70% and 50% of happy individuals in groups 1 and 3, $\alpha=0.05$, $\beta=0.10$, at least 100 patients for each group should be included. Considering that caregivers would mainly be caring for patients whose profiles would be similar of group 3, initial planning was that comparisons would be conducted between caregivers and patients from group 3. Thus, the minimum number of caregivers was also defined as 100.

Thus, the final sample comprised a minimum of 2,591 participants.

6.4.6 Ethical aspects

Participants (in the online and face-to-face formats) read and signed the Informed Consent Form (ICF) before agreeing to voluntary participation. The study was approved by the Research Ethics Committee of the Barretos Cancer Hospital (opinion no. 1.098.789 and 1.114.730).

6.4.7 Data collection instruments

6.4.7.1 Questionnaire on socio-demographic and clinical characteristics and issues potentially associated with feeling of happiness

For the development of this questionnaire, the items were defined after meetings among researchers from the Palliative Care and Quality of Life Research Group (GPQual) based on a literature review and discussions about potential factors related to happiness. Before proceeding to the main data collection, the first 50 individuals who completed the questionnaire had their answers checked in order to assess accuracy, frequency of missing items, and verification of SurveyMonkey's functioning. The questionnaire included socio-demographic characterization data, such as age, sex, marital status, religion, and demographic region, as well as clinical characterization data, such as personal perception of health and previously diagnosed health problems. Several items addressed issues potentially associated with the perception of happiness (**Supplementary Material 1 [Tese, Anexo F])**.

6.4.7.2 Pemberton Happiness Index (PHI)

The PHI consists of eleven items related to different domains of remembered well-being (general, hedonic, eudaimonic and social) and ten items related to recently experienced well-being (previous day's events). The higher the scores are on the Likert scale, the greater the happiness. The sum of the items produces a combined well-being index (total PHI)[22]. The Portuguese version is valid and reliable for use in the Brazilian population through online surveys[23]. In the present study, the PHI-remembered (PHI-r) score was used. The Cronbach's α was 0.877.

6.4.7.3 Satisfaction with Life Scale (SWLS)

The SWLS consists of five items that evaluate a cognitive component of life satisfaction, and participants answer on a seven-point scale, ranging from 1 (totally disagree)

to 7 (totally agree). In the Brazilian validation[24] the Cronbach's α was 0.89. This scale is the most widely used scale for assessing overall life satisfaction and has been implemented in several languages and cultures, providing good psychometric index[25, 26]. In the present study, Cronbach's α was 0.873.

6.4.7.4 Diener and Emmons' Positive and Negative Experience Scale (PNES)

The PNES seeks to assess subjective well-being and the constructs positive and negative affects. The PNES was originally composed of nine items (four positive and five negative), which are answered on a 7-point Likert scale[3]. In a previous Brazilian study, the scale included 10 items with the addition of the item "optimistic" and revealed adequate psychometric parameters[27]. In the present study, the Cronbach's α was 0.803 (positive affect) and 0.746 (negative affect).

6.4.8 Statistical analysis

The sample was described using absolute and relative frequencies. Data from participants that answered at least to PHI and SWLS were included in the statistical analysis. The data normality was tested using the Kolmogorov-Smirnov test. Initially, each variable potentially related to study outcomes (PHI, SWLS, PNES scores) was associated with happiness, life satisfaction, and negative/positive affect scores. The categorical variables with 2 and 3 categories were compared by means of the Mann-Withey and Kruskal-Wallis tests, respectivelly. Only variables with $p < 0.05$ in the univariate analyses were included in the multiple linear regression models, which were adjusted for age, sex, income, and education. A significance level of 5% was adopted, and the analyses were performed in SPSS v.21.0.

Additional analyses were conducted to compare individual item scores from PHI between groups of participants by means of Kruskal-Wallis test. Scores from items that evaluate "personal growth" and "meaning in life", as well as an item that measures "ability to enjoy small things in daily life", were chosen. Additionally, an item measuring "bad moments in daily life" was chosen to validate the hypothesis of greater happiness perception in those facing cancer (informal caregiver and cancer patients) even reporting more suffering / negative affects in daily life. Main contents and item descriptions of the selected PHI items are as follows: eudaimonic well-being/life meaning ("I think my life is

useful and worthwhile"); eudaimonic well-being/personal growth ("My life is full of learning experiences and challenges that make me grow"); hedonic well-being /positive affect (I enjoy a lot of little things every day); and hedonic well-being /negative affect ("I have a lot of bad moments in my daily life").

6.5 Results

A total of 2,580 participants were included in the study, of which 2,112 (81.9%) were representatives healthy of the general population, 342 (13.3%) were cancer patients and 126 (4.9%) were informal caregivers of cancer patients. The majority was female (76.0%), white (67.0%), 18-29 years old (38.1%), married (49.1%), resided in the southeastern region of the country (47.6%) and lived in an urban area (95.9%). **Table 1** presents the socio-demographic characteristics of the study participants. **Supplementary Figure 1 [Tese, Anexo G])** shows the flowchart of study participant selection.

Univariate analyses were performed for each of the instruments used (PHI-r, SWLS, PNES). Statistically significant variables were included in adjusted multiple linear regression models. The detailed results of the univariate analyses are presented in the supplemental materials **(Supplementary Materials 2 to 5 [Tese, Anexo H, I, J e K])**.

6.5.1 PHI-r

In the multivariate model, the informal caregivers (β=0.8, p≤0.001) and cancer patients (β=0.5, p≤0.001) presented higher rates of happiness in relation to the general population. Positive self-assessment of health (β=0.6, p≤0.001) and reporting optimism (β=1.4, p=<0.001) were associated with increased happiness scores. Regarding the aspects of the participants' daily life, a higher frequency of family gatherings (β=0.4, p≤0.001), contacts with nature (β=0.2, p=0.044), leisure moments (β=0.3, p≤0.001), and physical activity ≥3 times per week (β=0.3, p≤0.001) were associated with higher PHI scores in the multivariate model. By contrast, previous diagnosis of depression (β=-0.7, p≤0.001), anxiety (β=-0.3, p≤0.001) and other psychiatric/psychological problems (β=-0.7, p=0.002) were negatively associated with the participants' happiness scores (**Table 2**).

6.5.2 SWLS

In relation to life satisfaction, informal caregivers (β=2.9, p≤0.001) and the cancer patients (β=0.9, p=0.051) had higher scores than the general population. In the multivariate model, greater life satisfaction was associated with positive self-assessment of health (β=2.3, p≤0.001), optimism (β=3.4, p≤0.001), happiness with work (β=2.4, p≤0.001) and satisfaction with financial issues (β=3.4, p≤0.001). Being separated or divorced (β=-2.0, p≤0.001) and having previous diagnosis of depression (β=-2.5, p≤0.001) or anxiety (β=-0.9, p=0.002) were negatively associated with life satisfaction (**Table 3**).

6.5.3 PNES

Higher positive affect scores were associated with participants who reported optimism (β=5.2, p≤0.001), positive self-assessment of health (β=1.2, p=0.001), happiness with work (β=1.5, p≤0.001), satisfaction with financial issues (β=1.9, p≤0.001) and moments of leisure (β=1.7, p<0.001). Lower positive affect levels were noted in cancer patients (β=-3.8, p≤0.001) and informal caregivers (β=-2.0, p≤0.001) compared with the general population. Previous diagnosis of depression (β=-2.1, p≤0.001), anxiety (β=-0.9, p≤0.001), some other psychiatric/psychological problem (β=-1.4, p=0.027) and not having a job (β=-1.0, p=0.007) were also associated with lower positive affect levels (**Table 4**).

Subsequently, higher levels of negative affects were observed in informal caregivers (β=3.6, p≤0.001) and cancer patients (β=2.3, p≤0.001) in relation to the general population. Individuals with a previous diagnosis of depression (β=2.2, p≤0.001) and anxiety (β=1.5, p≤0.001) also exhibited higher negative affect levels. By contrast, a positive self-assessment of health (β=-0.7, p=0.005), optimism (β=-3.5, p≤0.001), happiness with work (β=-1.3, p≤0.001), satisfaction with financial issues (β=-0.9, p≤0.001) and not having a sick loved one (β=-0.5, p=0.005) were associated with lower negative affect levels (**Table 5**).

6.5.4 Analyses among patient groups

To better understand whether the results identified in the regression analyses applied to all patients, instrument scores were compared among three groups of patients: survivors (no evidence of disease and no antineoplastic treatment); adjuvant therapy (no evidence of disease but under antineoplastic treatment); and palliative care only (evidence of disease and no antineoplastic treatment). **Figure 1** reveals that the scores are similar between survivors and patients receiving adjuvant therapies; however, palliative care-only patients

have lower PHI-r, SWLS and positive affect scores. No significant differences between the medians of negative affects were noted among the three groups.

6.5.5 PHI individual scores

Median and interquartile range (IQR) values of PHI items were compared between cancer patients, informal caregivers and healthy people: “life meaning” item (cancer patients=10(1); caregivers=10(1); general population=9(3); p<0.001); “personal growth” item (cancer patients=10(2); caregivers=10(2); general population=9(4); p<0.001); “enjoy little things” item (cancer patients=10(2); caregivers=9(3); general population=7(4); p<0.001); and “bad moments” item (cancer patients=5(6); caregivers=6(5); general population=3(5); p<0.001).

6.6 Discussion

In this study, the perceptions of happiness, life satisfaction and positive and negative affects of a population of cancer patients and informal caregivers of cancer patients were measured and compared with the perceptions of healthy individuals from the general population who are social network users. Linear regression analyses confirmed the association of several personal, health, financial and work characteristics, leisure activities and rest with greater perceptions of happiness, life satisfaction and positive affects. Even after adjusting for age, sex, income and education, cancer patients and informal caregivers were happier compared with healthy people from the general population. Interestingly, patients and caregivers presented lower positive affect scores and higher negative affect scores. The results prompted us to formulate the concept that even with more problems in daily life (which generate more negative affects), individuals suffering from cancer or with a loved one suffering from cancer feel happier and more satisfied with life likely due to changing expectations about the future and valuing simpler aspects of everyday life.

6.6.1 Main findings

The feeling of happiness is subject to a wide range of external influences; however, hereditary components are present that can be explained by the genetic architecture of the personality and are responsible for 30% to 50% of the scores variance[4, 28, 29]. The “genetics of happiness” and personality traits maintain relatively constant happiness scores over time.

However, engaging in activities that promote increased happiness may also potentially improve positive feelings levels for significant periods of time[4]. In this study, the final linear regression models explained between 54% and 65% of the variance in the participants' scores of happiness, life satisfaction and positive and negative affects, suggesting that the remaining percentage of variance may be explained by genetic or personality-specific aspects, which were not investigated.

In the present study, the characteristics associated with higher happiness scores enhance the multidimensional nature of the "happiness" construct. Some categories of factors that tend to positively influence the general population's sense of happiness have been described in prior studies, such as optimism, pursuit of goals and purposes, acts of kindness, expression of gratitude, financial satisfaction, physical exercise, social relationships, rest, and altruism[30-32]. The present study was the first to detail happiness-related conditions in a large sample of the Brazilian population using properly validated tools.

For an adequate understanding of the results of this study, it should be emphasized that the scales used tend to measure slightly different constructs. The PNES uses more direct questions and investigates more transient life aspects. The SWLS and PHI-r include more reflective questions, addressing existential aspects. Some examples of such items are: from SWLS, "As much as possible, I have achieved the important things I want out of life"; from PHI, "My life is full of learning experiences and challenges that make me grow," and "I enjoy a lot of little things every day". These differences explain why patients and informal caregivers have less positive and more negative affects and simultaneously better happiness and life satisfaction scores, which at first pass would appear illogical. Aiming to validate this finding, a different analysis was performed. Scores from items that evaluate "personal growth" and "meaning in life", as well as the item that measures "ability to enjoy small things in daily life", were higher among patients and caregivers in comparison with healthy people. Again, both patients and caregivers reported higher scores of "bad moments in daily life" item when compared with healthy people.

Patients with cancer and cancer survivors who are happy tend to have a better quality of life and fewer symptoms compared with unhappy patients. In addition, happier cancer patients are more likely to report positive expectations about the future; have more life goals, optimism and hope, and positive changes within their relationships; are better at

coping with problems; and have higher spirituality levels[18, 21, 33]. Acceptance of the cancer diagnosis and the “path” through treatment are often seen as psychosocial and spiritual transitions, which can lead to restructuring of values, reflecting how patients assess life and their sense of happiness[20, 21]. Thus, it is important to evaluate happiness in cancer patients and to seek methods to stimulate it, i.e., through support during treatment or stimulation for the development of positive characteristics unrelated to the disease or its treatment. The role of the health professional should not be limited exclusively to issues related to the disease itself.

The well-being of informal caregivers of cancer patients is also affected by the cancer diagnosis[10, 11]. Caring for suffering patients can cause a significant negative emotional load in their caregivers as well as fatigue, physical exhaustion, etc. Despite these negative parameters, caregivers of cancer patients may presente high well-being levels that are influenced by characteristics and events inherent to their own life and the life of those for whom they care[17].

According to a Buddhist aphorism, “we all want to be happy and not suffer”. However, the results of this study suggest that suffering (self and/or evidenced in someone close), although undesirable, has a role in individual growth in healthy individuals or individuals with chronic diseases (such as cancer)[15, 17, 20, 21]. In cancer patients exclusively receiving palliative care, the perception of happiness and life satisfaction was reduced compared with the other groups of cancer patients, as expected. In these patients, physical (pain, fatigue, nausea, dyspnea, among others) and psychosocial suffering are high, especially at the end of life. After adequate control of physical and psychological symptoms, strategies focused on problem solving, personal issues, forgiveness and dignity therapy may play a fundamental role in the existential domain. If managed properly, these patients will probably report higher happiness and life satisfaction scores. However, this hypothesis needs to be tested in future studies.

A comparative study[34] between students from Brazil and Norway evaluated the use and efficiency of 14 strategies in regulating emotion with the aim of stopping anger, anxiety and sadness. Norway and Brazil were chosen because they were thought to represent, respectively, individualistic and collectivistic cultures. In general, the Norwegians used a greater number of strategies than the Brazilians. Cultural differences were suggested by comparatively high user ratings of "working", "acting out", and "go for a walk" for

Norwegians, and "relaxation" and "entertainment" for Brazilians. The "pray to God" strategy was also higher used by Brazilians than Norwegians. Thus, it is suggested that people from collectivist countries (such as Brazil) seek strategies for regulating emotions that foster individualism and self-knowledge. In the present study, at the time of emotional crisis (cancer diagnosis), the Brazilian participants presented higher scores of happiness and satisfaction with life, which may suggest that the pursuit of self-knowledge and individualization could have lead to personal growth. However, subsequent studies need to be designed to explain these findings.

6.6.2 Strengths and weaknesses

This study has some limitations, such as the participating patients' caregivers were not evaluated and there was no information about the conditions of the patients who the participating caregivers were accompanying; however, it was assumed that they were patients with reduced functionality given that many patients do not need caregivers when they are in good physical condition. Although the social media healthy participants were selected from the general population, they probably do not characterize and represent the entire Brazilian population.

By contrast, the study is original because no other study has been conducted in Brazil that evaluates the constructs studied in the different groups addressed and because the feeling of happiness is rarely measured in cancer patients. In addition, it was possible to make a comparison with a large population of the same nationality and from different regions.

The pooled analysis of a general population and people facing the condition of a cancer, whether patient or caregiver, has its limitations. Although statistical adjustment techniques have been used, the combined populations are of different profiles and can be considered a potential selection bias. Compared with the last Brazilian population census, our sample agrees that the most populous region is the Southeast, as well as the largest number of white Brazilians living in urban areas and Catholics; on the other hand, our study included a more expressive number of women, with a higher income and educational level than the general population described in the census. Regarding the mode of administration (on-line and face-to-face), previous comparative studies[35, 36] has shown no or only small magnitude influence on the responses to the questionnaires. Moreover, the authors were

careful to use the same research instruments of data collection and to properly train the interviewers to standardize data collection.

6.7 Conclusions

The conditions related to the perception of happiness and life satisfaction as well as negative and positive affects were identified. Overall, the conditions related to happiness, life satisfaction and positive affects are similar. However, contrary to what was expected, cancer patients and informal caregivers of cancer patients reported higher levels of happiness and life satisfaction compared with healthy people, even though they had lower positive affect scores and higher negative affect scores. These individuals are probably experiencing more difficulties (suffering) in daily life. However, given their condition, they perceive life differently and report being happier.

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Table 1 – Socio-demographic characteristics of participants (n=2580).

Characteristics	Total (n=2580)	General Population (n=2112)	Cancer Patients (n=342)	Family caregivers (n=126)	p-value
	n (%)	n (%)	n (%)	n (%)	
Gender					<0.001
Male	620 (24.0)	479 (22.3)	122 (35.7)	28 (22.2)	
Female	1960 (76.0)	1672 (77.7)	220 (64.3)	98 (77.8)	
Race (ethnicity)					<0.001
White	1729 (67.0)	1483 (70.2)	207(60.5)	39 (31.0)	
Black	131 (5.1)	83 (3.9)	30 (8.8)	18 (14.3)	
Latino	633 (24.5)	476 (22.5)	90 (26.3)	67 (53.2)	
Asian	64 (2.5)	55 (2.6)	07 (2.0)	02 (1.6)	
Missing	23 (0.9)	15 (0.7)	08 (2.3)	00 (0.0)	
Age (years)					<0.001
18-29	983 (38.1)	938 (44.4)	17 (5.0)	28 (22.2)	
30-39	765 (29.7)	699 (33.1)	24 (7.0)	42 (33.3)	
40-49	364 (14.1)	277 (13.1)	68 (19.9)	19 (15.1)	
50-59	292 (11.3)	141 (6.7)	124 (36.3)	27 (21.4)	
60-69	133 (5.2)	47 (2.2)	78 (22.8)	08 (6.3)	
≥70	42 (1.6)	10 (0.5)	30 (8.8)	02 (1.6)	
Missing	01 (0.0)	00 (00)	01 (0.3)	00 (0.0)	
Marital Status					<0.001
Married or live married	1266 (49.1)	1002 (47.4)	189 (55.3)	75 (59.5)	
Windowed	64 (2.5)	24 (1.1)	35 (10.2)	05 (4.0)	
Separated or divorced	179 (6.9)	123 (5.8)	48 (14.0)	08 (6.3)	
Single	1053 (40.8)	951 (45.0)	64 (18.7)	38 (30.2)	
Other / Do not Know	18 (1.4)	12 (0.6)	06 (1.8)	00 (0.0)	
Region where live					<0.001
North	244 (9.5)	168 (8.0)	19 (5.6)	57 (45.2)	
Northeast	264 (10.2)	240 (11.4)	06 (1.8)	18 (14.3)	
Southeast	1228 (47.6)	964 (45.6)	264 (77.2)	00 (0.0)	
Midwest	273 (10.6)	179 (8.5)	46 (13.5)	48 (38.1)	
South	571 (22.1)	561 (26.6)	07 (2.0)	03 (2.4)	
Location where live					<0.001
Urban Area	2473 (95.9)	2060 (97.5)	312 (91.2)	101 (80.2)	
Rural Area	107 (4.1)	52 (2.5)	30 (8.8)	25 (19.8)	
Educational Level					<0.001
<8 years	259 (10.0)	26 (1.2)	186 (54.4)	47 (37.3)	
8 to 11 years	349 (13.5)	218 (10.3)	77 (22.5)	54 (42.9)	
>11 years	1970 (76.4)	1866 (88.4)	79 (23.1)	25 (19.8)	
Missing	02 (0.1)	02 (0.1)	00 (0.0)	00 (0.0)	
Professional activity currently					<0.001
Yes	2427 (94.1)	2030 (96.1)	282 (82.5)	115 (91.3)	
No	153 (5.9)	82 (3.9)	60 (17.5)	11 (8.7)	
Family income*					<0.001
≤3.9 minimum wages	703 (27.2)	413 (19.6)	185 (54.1)	105 (83.3)	
≥4 minimum wages	1877 (72.8)	1699 (80.4)	157 (45.9)	21 (16.7)	
Has any religion					<0.001
Catholic	1310 (50.8)	1058 (50.1)	197 (57.6)	55 (43.7)	
Evangelic	436 (16.9)	333 (15.8)	94 (27.5)	09 (7.1)	
Spiritist	413 (16.0)	382 (18.1)	30 (8.8)	01 (0.8)	
Other	28 (1.1)	24 (1.1)	02 (0.6)	02 (1.6)	
No formal religion	387 (15.0)	309 (14.6)	19 (5.6)	59 (46.8)	
Atheist or agnostic	06 (0.2)	06 (0.3)	00 (0.0)	00 (0.0)	

*Brazilian minimum wage.

Table 2 - Multiple Linear Regression for evaluation of happiness associated characteristics measured by PHI-r (n=2580).

Variables	**β (SE)**	**IC95%**	**p-Value**
Constant	4.4 (0.2)	4.1 – 4.8	<0.001
Participants			
General population	-	-	-
Caregivers of cancer patients	0.8 (0.2)	0.4 –1.1	<0.001
Cancer patients	0.5 (0.1)	0.2 – 0.8	<0.001
Feeling of happiness with the professional activity			
Little[1]	-	-	-
Much[2]	0.6 (0.1)	0.5 – 0.8	<0.001
Self-assessment of health			
Bad[3]	-	-	-
Good [4]	0.6 (0.1)	0.4 – 0.8	<0.001
Diagnosis of depression			
No	-	-	-
Yes	-0.7 (0.1)	-0.9 – (-0.4)	<0.001
Diagnosis of anxiety			
No	-	-	-
Yes	-0.3 (0.1)	-0.5 – (-0.1)	<0.001
Other psychological/psychiatric problem			
No	-	-	-
Yes	-0.7 (0.2)	-1.2 – (-0.3)	0.002
Current professional activity			
Yes	-	-	-
No	-0.3 (0.1)	-0.6 – (0.0)	0.028
Satisfaction with financial issues			
Little[1]	-	-	-
Much[2]	0.5 (0.1)	0.4 – 0.6	<0.001
Frequency of family gatherings			
Little [5]	-	-	-
Much[6]	0.4 (0.1)	0.2 -0.5	<0.001
Influence of religious or spiritual life on happiness			
Little[1]	-	-	-
Much[2]	0.3 (0.1)	0.2 – 0.5	<0.001
It is considered			
Pessimistic	-	-	-
Neither optimistic nor pessimistic	0.7 (0.1)	0.4 – 0.9	<0.001
Optimistic	1.4 (0.1)	1.1 – 1.6	<0.001
Contact with nature			
Little [5]	-	-	-
Much[6]	0.2 (0.1)	0.0 – 0.3	0.044
Leisure time			
Little[1]	-	-	-
Much[2]	0.3 (0.1)	0.2 – 0.5	<0.001
Physical activity			
Don't practice physical activity	-	-	-
1 a 2 times per week	0.0 (0.1)	-0.1 – 0.2	0.825
3 or more times per week	0.3 (0.1)	0.1 – 0.4	<0.001

Model adjusted for the variables: age, gender, family income and education level (R^2=0.598).
[1]nothing/very little/more or less. [2]fairly/extremely. [3]very poor/poor/neither bad nor good. [4]good/very good. [5]nothing/very little/more or less. [6]many times/always.

Table 3 - Multiple Linear Regression for evaluation of characteristics associated with satisfaction with life, measured by SWLS (n=2580).

Variables	β (SE)	IC95%	p-Value
Constant	15.1(0.7)	13.8 – 16.4	<0.001
Participants			
General population	-	-	-
Caregivers of cancer patients	2.9 (0.6)	1.7. – 4.2	<0.001
Cancer patients	0.9 (0.5)	0.0 – 1.9	0.051
Marital status			
Married or live married	-	-	-
Windowed	-1.1 (0.7)	-2.6 – 0.3	0.116
Separated or divorced	-2.0 (0.4)	-2.9 (-1.1)	<0.001
Single	-0.2 (0.3)	-0.7 – 0.3	0.536
Feeling of happiness with the professional activity			
Little[1]	-	-	-
Much[2]	2.4 (0.2)	1.9 – 2.9	<0.001
Self-assessment of health			
Bad[3]	-	-	-
Good [4]	2.3 (0.3)	1.7 – 2.9	<0.001
Diagnosis of depression			
No	-	-	-
Yes	-2.5 (0.4)	-3.4 – (-1.7)	<0.001
Diagnosis of anxiety			
No	-	-	-
Yes	-0.9 (0.3)	-1.5 – (-0.3)	0.002
Place of residence (Brazilian region)			
Southeast	-	-	-
Midwest	-0.9 (0.3)	-1.6 - (-0.2)	0.016
Northeast	-0.7 (0.4)	-1.4 – 0.1	0.080
North	0.4 (0.4)	-0.4 – 1.2	0.303
South	0.1 (0.3)	-0.5 – 0.6	0.898
Satisfaction with financial issues			
Little[1]	-	-	-
Much[2]	3.4 (0.2)	2.9 – 3.9	<0.001
Frequency of family gatherings			
Little[5]	-	-	-
Much[6]	1.3 (0.2)	0.9 -1.8	<0.001
Influence of religious or spiritual life on happiness			
Little[1]	-	-	-
Much[2]	1.1 (0.2)	0.6 – 1.6	<0.001
It is considered			
Pessimistic	-	-	-
Neither optimistic nor pessimistic	1.5 (0.5)	0.6 – 2.5	0.002
Optimistic	3.4 (0.5)	2.5 – 4.4	<0.001
Leisure time			
Little[1]	-	-	-
Much[2]	1.4 (0.2)	0.9 – 1.9	<0.001
Physical activity			
Don't practice physical activity	-	-	-
1 a 2 times per week	0.3 (0.3)	-0.2 – 0.9	0.230
3 or more times per week	0.8 (0.3)	0.2 – 1.3	0.004

Model adjusted for the variables: age, gender, family income and education level (R^2=0.633).
[1]nothing/very little/more or less. [2]fairly/extremely. [3]very poor/poor/neither bad nor good. [4]good/very good. [5]nothing/very little/more or less. [6]many times/always.

Table 4 - Multiple Linear Regression for evaluation of characteristics associated with positive affects measured by PNES (n=2580).

Variables	β (SE)	IC95%	p-Value
Constant	17.9(0.5)	16.9 – 18.9	<0.001
Participants			
General population	-	-	-
Caregivers of cancer patients	-2.0 (0.5)	-2.9 – (-1.1)	<0.001
Cancer patients	-3.8 (0.4)	-4.5 – (-3.0)	<0.001
Current professional activity			
Yes	-	-	-
No	-1.0 (0.4)	-1.7 – (-0.3)	0.007
Voluntary activity			
No	-	-	-
Yes	0.3 (0.2)	0.0 – 0.7	0.092
Voluntary financial donation			
No	-	-	-
Yes	0.7 (0.2)	0.3 – 1.1	<0.001
Influence of religious or spiritual life on happiness			
Little[1]	-	-	-
Much[2]	0.5 (0.2)	0.1 – 0.9	0.006
Self-assessment of health			
Bad[3]	-	-	-
Good [4]	1.2 (0.2)	0.7 – 1.6	0.001
Diagnosis of depression			
No	-	-	-
Yes	-2.1 (0.3)	-2.8 – (-1.5)	<0.001
Diagnosis of anxiety			
No	-	-	-
Yes	-0.9 (0.2)	-1.4 – (-0.4)	<0.001
Other psychological/psychiatric problem			
No	-	-	-
Yes	-1.4 (0.6)	-2.6 – (-0.2)	0.027
Frequency of family gatherings			
Little [5]	-	-	-
Much[6]	0.7 (0.2)	0.3 – 1.0	<0.001
Satisfaction with financial issues			
Little[1]	-	-	-
Much[2]	1.9 (0.2)	1.5 – 2.2	<0.001
It is considered			
Pessimistic	-	-	-
Neither optimistic nor pessimistic	2.1 (0.4)	1.3 - 2.9	<0.001
Optimistic	5.2 (0.4)	4.5 – 6.0	<0.001
Leisure time			
Little[1]	-	-	-
Much[2]	1.7 (0.2)	1.3 - 2.1	<0.001
Physical activity			
Don't practice physical activity	-	-	-
1 a 2 times per week	0.2 (0.2)	-0.3 – 0.6	0.487
3 or more times per week	0.5 (0.2)	0.1 – 0.9	0.010

Model adjusted for the variables: age, gender, family income and education level (R^2=0.651).
[1]nothing/very little/more or less. [2] fairly/extremely. [3]very poor/poor/neither bad nor good. [4]good/very good. [5]nothing/very little/more or less. [6]many times/always.

Table 5 - Multiple Linear Regression for evaluation of characteristics associated with negative affects measured by PNES (n=2580).

Variables	**β (SE)**	**IC95%**	**p-Value**
Constant	17.7(0.5)	16.7 – 18.8	<0.001
Participants			
General population	-	-	-
Caregivers of cancer patients	3.6 (0.5)	2.7 –4.5	<0.001
Cancer patients	2.3 (0.4)	1.6 – 3.0	<0.001
Feeling of happiness with the professional activity			
Little[1]	-	-	-
Much[2]	-1.3 (0.2)	-1.6 – (-0.9)	<0.001
Self-assessment of health			
Bad[3]	-	-	-
Good [4]	-0.7 (0.2)	-1.1 – (-0.2)	0.005
Sickness in a close person (a loved one)			
Yes	-	-	-
No	-0.5 (0.2)	-0.8 – (-0.1)	0.005
Diagnosis of depression			
No	-	-	-
Yes	2.2 (0.3)	1.5 – 2.8	<0.001
Diagnosis of anxiety			
No	-	-	-
Yes	1.5 (0.2)	1.0 – 1.9	<0.001
Satisfaction with financial issues			
Little[1]	-	-	-
Much[2]	-0.9 (0.2)	-1.3 – (-0.5)	<0.001
It is considered			
Pessimistic	-	-	-
Neither optimistic nor pessimistic	-1.7 (0.4)	-2.5 – (-0.9)	<0.001
Optimistic	-3.5 (0.4)	-4.2 – (-2.7)	<0.001
Leisure time			
Little[1]	-	-	-
Much[2]	-0.9 (0.2)	-1.3 – (-0.5)	<0.001
Physical activity			
Don't practice physical activity	-	-	-
1 a 2 times per week	0.0 (0.2)	-0.4 – 0.5	0.901
3 or more times per week	-0.6 (0.2)	-0.9 – (- 0.1)	0.006

Model adjusted for the variables: age, gender, family income and education level (R^2=0.544).
[1]nothing/very little/more or less. [2]fairly/extremely. [3]very poor/poor/neither bad nor good. [4]good/very good. [5]nothing/very little/more or less. [6]many times/always.

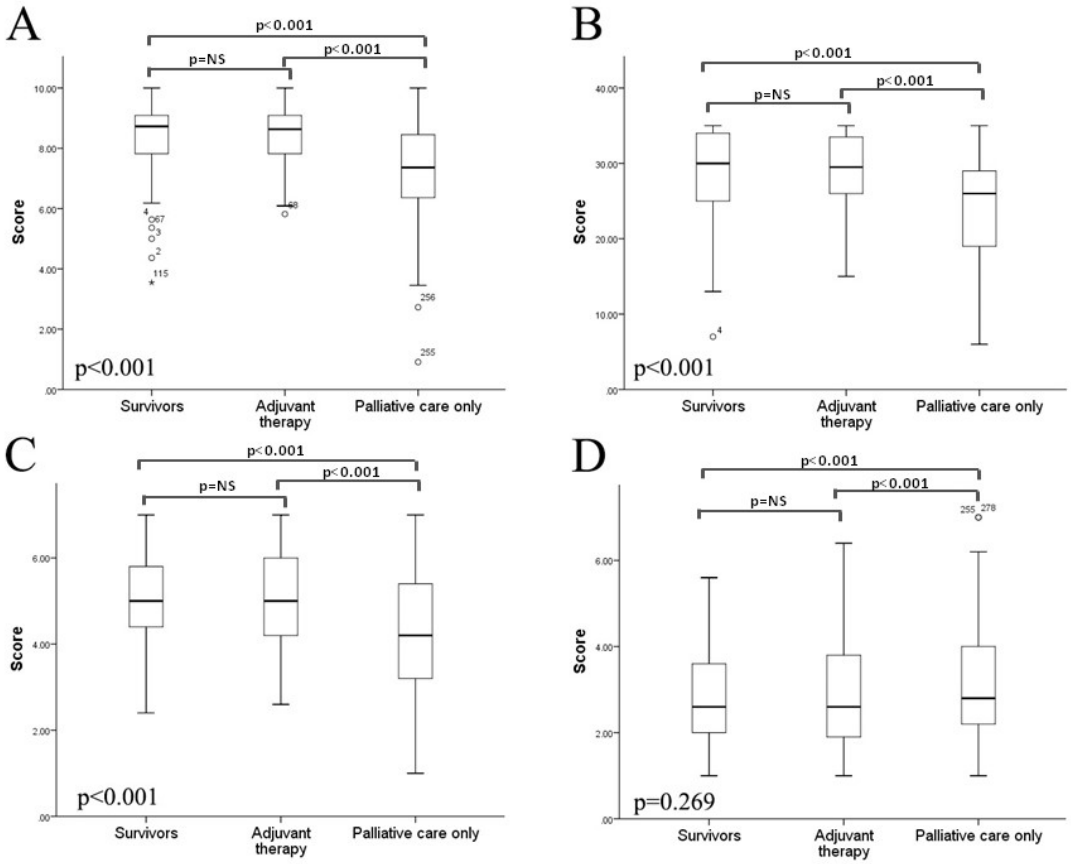

Figure 1 Comparisons of PHI-r, SWLS, and PNES scores between patients with cancer undergoing different phases of disease. PHI-r (A), SWLS (B), PNES-positive (C), and PNES-negative (D) median scores were compared among three groups of patients: survivors (no evidence of disease and no antineoplastic treatment); adjuvant therapy (no evidence of disease but under antineoplastic treatment); and palliative care only (evidence of disease and no antineoplastic treatment). Legend: PHI-r, remembered Pemberton Happiness Index; SWLS, Satisfaction with Life scale; PNES, Diener and Emmons' Positive and Negative Experience Scale

7 ARTIGO 4

Referência: de Camargos MG, Paiva BSR, de Almeida CSL, Paiva CE. What Is Missing for You to Be Happy? Comparison of the Pursuit of Happiness Among Cancer Patients, Informal Caregivers, and Healthy Individuals. *J Pain Symptom Manage*. 2019 Jun 11. pii: S0885-3924(19)30305-7. doi: 10.1016/j.jpainsymman.2019.05.023. PubMed PMID: 31195075.
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7.1 What Is Missing for You to Be Happy? Comparison of the Pursuit of Happiness Among Cancer Patients, Informal Caregivers, and Healthy Individuals

7.1.1 Abstract

Context: After cancer diagnosis, personal value priorities may change in a way that would transform such values and how life is perceived by cancer patients and their caregivers, including happiness and its pursuit. Objectives: The objective of the study was to analyze and compare what cancer patients, informal caregivers, and healthy population believe that would make them happy. **Methods:** A qualitative content analysis was performed on the responses to a single question: “What is missing for you to be happy?” Narratives of cancer patients (*n* = 242, face-to-face interview), informal caregivers (*n* = 125, face-to-face interview), and healthy participants (*n* = 1,671, recruited through social media, online survey) were analyzed. Word clouds were created for each group of participants. Contents were identified and frequencies were compared among participants by means of chi-square and Fisher's exact tests. **Results:** Overall, participants were pursuing better health (*n* = 288, 14.1%), better interpersonal relationships (*n* = 456, 22.4%), money (*n* = 412, 20.2%), and work-related aspects (*n* = 481, 23.6%). Cancer patients and informal caregivers sought better health and cure more often than when compared to healthy people ($P < 0.001$). Among cancer patients, survivors' profile tended to be similar to that of the healthy population concerning what they need to be happy. Unexpectedly, “cure” (22.7%) was more frequent among participants with incurable cancer. **Conclusion:** Regardless of the group they were in, participants sought happiness in what they considered to be important to their lives, but it was something they did not have at the time of the interview. Psychoeducational and

cognitive-behavioral strategies focused on how to deal with life expectations among people facing cancer are awaited.

7.2 Keywords

Happiness, Subjective well-being, Cancer, Caregiver, Pursuit

7.3 Introdution

Happiness is a subjective experience that represents one of the main goals in human life.[1,2] It is an experience of contentment or positive well-being, in association with the feeling that life is good, meaningful, and valuable.[3] Happiness is an internal experience that serves as a basis for each individual to judge his or her own life and ‘‘how’’ and ‘‘why’’ they experience it in a positive manner.[4-6] It is a complex concept for which many definitions are available in the literature.[7-9] Although poorly understood, it is hardly pursued.[6,10] In other and simpler words, happiness is the assessment of how much we like the life we live.[9,11] The United States Constitution considers it an unalienable human right[12] and the United Nations a fundamental human goal.[13]

Like ‘‘happiness’’, the term ‘‘quality of life’’ (QOL) is very particular, considered subjective and difficult to define by many authors. For this reason, the World Health Organization defined QOL as ‘‘the individual’s perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards, and concerns.’’[14] They further stated that happiness is a widely presumed component of QOL.[14]

The lives of cancer patients and their caregivers may be affected by the cancer diagnosis, which might also influence how they see happiness.[5,15,16] The reason is that these individuals deal routinely with critical issues related to physical, social, emotional, and spiritual aspects,16e19 in addition to undergoing an unknown and an uncertain experience.[20,21] In this study, informal caregivers are those who provide informal care, that is, they care for or provide help to family, friends, neighbors, or other known health reasons.[22]

Although patients present distressing symptoms associated with disease progression and even changes in QOL, they also report positive emotional states.[5,18,23] Caregivers of cancer patients may also have their lives affected by the cancer diagnosis[24-26] because they

help patients deal with functional, clinical, and psychosocial issues.[17] All these factors can play a critical role in their mental health and QOL.[27,28] However, caregivers may also find upsides in these experiences, which may be associated with better outcomes in well-being and levels of happiness.[19,29,30]

This may occur because the subjective well-being of a person may depend on value priorities of individuals.[31] Personal values reflect what is essentially important to a person and therefore form a central part of the individual's identity, guiding his or her action.[32] Experiences that occur during the oncology treatment may help patients in having a greater perception and learning, making them ''more aware'' of what really matters at the present moment and in the future. Cancer survivors refer to positive aspects of the disease and attribute them to their experience, that is, adaptive strategy, existential growth, and/or behavioral changes.[33] Thus, during this journey, personal value priorities may change in a way that transforms such values and the way life is perceived by cancer patients and their caregivers, including happiness and its pursuit.[34-36]

Most medical literature on oncology has evaluated the impact of cancer and its treatment on the development of negative consequences, that is, anxiety depression, and distress. However, little research has been done to measure positive psychological change after cancer. With a focus on positive psychology, our hypothesis is that cancer patients, as well as informal caregivers, should consider and point out specific items, but different from those of the general population, to describe what would make them happier.

Given the constant pursuit of happiness by human beings, the aim of the present study was to analyze and compare what the healthy population, cancer patients, and informal caregivers believe wouldmake them happy.

7.4 Methods

7.4.1 Study Design

The present study is a part of a larger yet unpublished research project that seeks to investigate the indices of happiness, life satisfaction, and perception of positive and negative effects of the Brazilian population and to identify conditions associated with the individual perception of happiness. This is a qualitative content analysis based on responses to a single question: ''What is missing for you to be happy?''

7.4.2 Ethical Issues

The present study complied with resolution no. 466/12 from the Brazilian National Health Council and was duly approved by the Research Ethics Committee at Barretos Cancer Hospital (ruling no. 1.098.789 and 1.114.730). All online and in-person participants read and signed an informed consent form agreeing to voluntary participation.

7.4.3 Eligibility Criteria and Study Participants

Individuals who met all the inclusion and exclusion criteria were included in the study. For general population, the inclusion criteria included Brazilian nationals; residing in Brazilian municipalities; having a Facebook and/or WhatsApp account. The exclusion criterion was age under 18 years.

For informal caregivers (people who were accompanying cancer patients at the time of the interview, being familiar or not), the inclusion criteria included Brazilian nationals; able to read and write; accompanying a cancer patient (relative or not) during treatment/follow-up at the cancer hospital. The exclusion criteria included age under 18 years old; any relevant neuropsychiatric condition preventing the patient from understanding and answering the health assessment questionnaire.

For cancer patients, the inclusion criteria included histological diagnosis of cancer of any type and clinical stage; age 18 to 75 years old; both sexes; able to read and write; in one of the following treatment phases: no evidence of disease and not receiving cancer treatment for at least two years, receiving systemic adjuvant treatment, or receiving palliative care exclusively. The exclusion criteria included any relevant neuropsychiatric condition that would prevent patients from understanding and answering the health assessment questionnaire; having hematologic cancer.

7.4.4 Study Setting and Data Collection

The recruitment strategy used was online data collection through the social network Facebook and the WhatsApp application and face-to-face data collection. Participants from the general population of all five Brazilian regions were recruited online via the Facebook social network (three different methodologies were used) and the WhatsApp application. The complete recruitment strategy is described in detail in **Supplementary Material 1 [Tese, Anexo L].** The survey was answered on the SurveyMonkey platform. In general terms, the

South and Southeast regions of Brazil are wealthier than other regions. In the Northeast region, for example, 40% of the population survives on a minimum wage.

A convenience sample of cancer patients and informal caregivers was interviewed in person using the same evaluation forms answered online. Patients were recruited at the oncology outpatient clinics and informal caregivers at two different institutional support houses, where cancer patients from other locations are lodged while being treated in the city of Barretos. Regarding patients, it was planned that an equal number of participants should be included among the three groups: cancer survivors, undergoing adjuvant treatment, and receiving palliative care exclusively (without antineoplastic treatment).

7.4.4.1 Data Collection

The present qualitative analysis was based on the responses to a single question: ‘‘What is missing for you to be happy?’’ The participants recruited online via Facebook and WhatsApp answered the survey individually by entering their responses on a SurveyMonkey form. Cancer patients and informal caregivers were interviewed in person in a reserved room and alone, by two trained nurses.

Participants were assessed only once. No interviews were recorded. The data collected online were automatically entered into SurveyMonkey spreadsheets. Responses given in person were transcribed on paper by interviewers during interviews. All the online and transcribed responses were later exported to IBM SPSS Statistics for Windows, version 21.0 (IBM Corp., Armonk, NY) and NVivo qualitative data analysis software, version 11 Pro (QSR International Pty Ltd) programs. Although the time taken to answer the open ended question was not computed, given the short length of the responses, it was estimated as a few minutes.

7.4.5 Sample Size

Traditionally, qualitative studies are not based on a statistical sample size calculation. However, the present study consisted of a secondary analysis of data collected in a larger, quantitative study with a calculated sample size. In any case, the robust sample size of this study is relevant when considering the intention to investigate the prevalence of narratives among different groups. Although qualitative studies usually analyze long narratives from a

few interviewees, the present one was based on short narratives from a large number of participants.

7.4.6 Data Analysis

7.4.6.1 Word Cloud Analysis

Word clouds can provide easy, quick, and meaningful analysis of qualitative data by providing interpretations through text size and color.37 In brief, the data were organized by synthesizing the narratives into one or more ‘‘words’’ relevant to topics mentioned in responses (phrase labels). Next, word clouds were generated, which graphically represented narratives and the frequency of words.

7.4.6.2 Content analysis

A qualitative data analysis was performed based on Bardin’s content analysis methodology.[38] The first step was the preanalysis, which consisted of direct and intense contact with the material and organization of the data to meet the evaluation standards, including exhaustiveness, representativeness, homogeneity, and relevance. The next step was to organize the topics according to their relevance and/or repetition (codification and categorization of the data). Word clouds were used by coders as exploratory forms of analysis that helped them to interpret the material. Transcripts were independently coded into categories and subcategories by two researchers (B.S.R.P. and M.G.d.C.); disagreements in coding were resolved during a consensus meeting with three investigators (B.S.R.P., M.G.d.C., and C.E.P.). The quantitative analysis was performed using the program NVivo 11 Pro.

At the end of the aforementioned procedures, investigators found differences in the response patterns among the groups of participants. For this reason, they decided to perform a joint analysis of all groups together and a separate analysis for the following groups: (1) general population, (2) informal caregivers, and (3) cancer patients. The group of patients was also analyzed according to the corresponding phase of ‘‘treatment,’’ namely ‘‘cancer survivors,’’ ‘‘adjuvant treatment,’’ and ‘‘exclusive palliative care.’’ It is noteworthy that palliative care meets the needs of all patients who need symptom relief and the needs of patients and their families for psychosocial and supportive care.[39] They are appropriate for patients diagnosed with incurable diseases, regardless of the supposed survival prognosis

of months or years. Exclusive palliative care is indicated when patients are in advanced stages and have a very low chance of being cured or when they are experiencing the terminal phase of the disease.[39]

Frequencies of identified themes (categories and subcategories) were compared among the general population, informal caregivers, and cancer patients by means of the chi-square test or Fisher's exact test. Similarly, frequencies of themes identified in narratives were compared among subgroups of cancer patients. Statistical analysis was performed adopting $P < 0.05$ as the significance level.

7.5 Results

Data were collected from October 2015 to October 2016. The final sample comprised 2580 participants: general population, n=2112; cancer patients, n=342; and informal caregivers, n=126. Twenty six cancer patients and eight informal caregivers were approached by the interviewer but not included in the study. Of those, three cancer patients were in significant emotional distress according to the interviewer's view, which prevented them from participating in the study. Since not all participants in the larger research project answered the question being analyzed in the present study, only the narratives from 2038 participants (79%) were included in the qualitative analysis. **Table 1** describes the characteristics of study participants.

7.5.1 Word Clouds

Based on participants' narratives and their synthesis into two or more words relevant to topics addressed in the responses, word clouds were generated for groups and subgroups, which summarized the findings (**Figure 1**). The clouds included larger (higher frequency) and smaller (lower frequency) words. The words ''profession'' (n=389; 16.5%) and ''money'' (n=367; 15.6%) were more evident in responses given by the general healthy population compared with patients and informal caregivers. In turn, the term ''better health'' was easily perceptible among patients (n= 101; 30.9%) and informal caregivers (n=41; 24.8%). Unexpectedly, the word ''cure'' (n=10; 19.6%) was more frequent among participants with incurable cancer (palliative care exclusively). Another finding deserving attention is the size of the word ''nothing'' for cancer patients categorized as ''survivors'' (n=21; 16.2%) and under ''adjuvant treatment'' (n=22; 15.1%).

7.5.2 Content Analysis

Nine categories were identified; some of them were further subcategorized. **Figure 2** depicts the identified brief categories, and **Supplementary Table 1 [Tese, Anexo M]** provides full category names and some illustrative examples. Most participants preferred to respond in short sentences, although they had the opportunity to give longer answers, both in the face-to-face and in the electronic format (up to 1000 characters could be typed in).

Tables 2 and 3 describe the frequencies of categories and subcategories identified in the analysis of the narratives per group and subgroup.

Responses corresponding to category 1, ‘‘nothing,’’ were more frequent among patients under adjuvant treatment (22.4%; p<0.001) and survivors (21.0%; p<0.001) compared with patients exclusively under palliative care (4.5%; p<0.001) (**Table 3**). Although the frequency of category 2, ‘‘I wish for health for myself or someone else in order to be happy,’’ did not differ significantly among the subgroups of cancer patients (p=0.137), there was a higher percentage of these responses among informal caregivers (54.4%; p<0.001) and the total population of cancer patients, regardless of the treatment phase (47.5%; p<0.001) (**Table 2**). Subcategory 2a, ‘‘I hope to find in healing a reason to be happy,’’ was more frequent among informal caregivers (24.8%; p<0.001) (**Table 2**) and cancer patients exclusively under palliative care (22.77%; p<0.001) (**Table 3**).

Category 3, ‘‘Good interpersonal relationships would make me happier’’, appeared in 20% to 25% of the narratives from participants from the general population (p<0.001), informal caregivers (p<0.001), and survivors (p=0.45) (**Tables 2 and 3**). In turn, subcategories 3a ‘‘I’m looking for a romantic relationship to be happier,’’ 3b ‘‘Building a family would make me happier,’’ and 3c ‘‘I need to be closer to my family to be happy’’ were seldom mentioned by the general population (p<0.001), informal caregivers (p<0.001), or cancer patients (p<0.001); the corresponding rates were low, with the maximum being 12% (**Table 2**). The frequency of these subcategories did not differ significantly among cancer patient subgroups (**Table 3**).

Category 4, ‘‘Having something to be happier,’’ was mentioned in 22% to 29% of the narratives of all participants grouped together (p=0.002), the general health population (p=0.002), all cancer patients (p=0.002), and survivors (p<0.001) (**Tables 2 and 3**). Subcategory 4a, ‘‘Money would make me happier,’’ was more frequent among the general

population (22.1%; p<0.001) (**Table 2**) and survivors (18.0%; p=0.012) (**Table 3**). Subcategory 4 b, ‘‘I need material things to be happy,’’ was more frequent among survivors (12.0%; p=0.046) (**Table 3**).

Category 8, ‘‘Better professional status,’’ was more frequent among the general population (27.5%; p<0.001) (**Table 2**).

Other categories and subcategories (described in detail in **Supplementary Table [Tese, Anexo M]**, although with pertinent content for the qualitative analysis, exhibited low frequencies of occurrence.

7.6 Discussion

7.6.1 Professional Status and Interpersonal Relationships

Almost 70% of the general healthy population comprised youths and individuals younger than 40 years, which may account for their focus on professional and financial matters. Indeed, the responses of 27.5% of this group fell into the category of ‘‘Better professional status.’’ Since work-related activities represent a very large part of everyday life, individuals might come to believe that satisfaction with their professional life has a substantial impact on their happiness.[40]

The responses of 20% to 25% of the general population, informal caregivers, and cancer survivors fell into the category ‘‘Good interpersonal relationships would make me happier.’’ Interestingly, this category was less frequent for patients under adjuvant treatment or exclusively under palliative care. Interpersonal relationships are important for happiness.[21,41] However, cancer patients may have other priorities, such as treatment and health, and thus do not consider interpersonal relationships as an important factor. In addition, the literature evidences the improvement of family and friendship relationships during the oncological disease process,33 suggesting that one might assume that in the presence of a threatening disease, friends and/or family are already close, which thus contributes to the low frequency of this category between these two subgroups.

Perceptible changes in personal value priorities are reported after a cancer diagnosis. Such changes might be considerable and lead patients and informal caregivers to restructure their values and how they perceive life. This can also influence how such individuals conceive of happiness, with possible changes in their expectations for the future and attribution of more value to simpler aspects of everyday life.[34,36] These changes might also reflect

uncertainty about the future, which makes individuals, such as patients with chronic diseases, mainly focus on the present and what they consider to be missing.[20,21]

7.6.2 Better Health and Cure

Category 2, ‘‘I wish for health for myself or someone else in order to be happy,’’ reinforced the idea conveyed by the word ‘‘health’’ in the word cloud, as its frequency was high in all groups and subgroups except for the general population. This was the category with the highest frequency among all analyzed groups. Other studies evidence the pursuit of health as one of the significant factors to increase happiness among patients with chronic diseases and their caregivers.[21]

Owing to the disease, cancer patients and informal caregivers might be looking for what is missing most: a better health. Despite other countless difficulties with which they have to cope during the complex period of disease and treatment, the recovery of one’s own health or the health of a loved one might be what would bring the most happiness to individuals in these two groups. Although it might seem obvious, these findings show that people seek what is missing in the pursuit of happiness in the present time. As a result, an individual might attribute little value to his or her own health (sedentary behavior, smoking, and so forth) but come to want it very much (in the pursuit of happiness) when ill.

Surprisingly, subcategory 2a, ‘‘I hope to find in healing a reason to be happy,’’ was most frequently mentioned by patients exclusively under palliative care, that is, by those who do not have any chance of being cured. This finding points to an inconsistency between awareness of the prognosis and the perception of the intent of the treatment/care received.[42,43] Some factors, alone or jointly, might explain this unrealistic expectation,[44] such as resistance to acceptance,45,46 denial,[47,48] difficulty understanding prognostic information,[49,50] and gaps in communication by healthcare professionals, who often face the stigma of giving bad news,[51,52] regarding the true goals of exclusive palliative care.

7.6.3 ‘‘To Have to Be’’

Attention should also be paid to category 4, ‘‘Having something to be happier,’’ since it was mainly mentioned by the general population and cancer survivors. A reasonable hypothesis to account for this finding is that cancer survivors gradually approximate the general population over time in terms of general quality of life[18,53] and well-being.[54] The

pursuit of happiness, as it concerns the acquisition of things considered to be missing, may be similar between these two groups.

7.6.4 Nothing Is Missing

Many people seemed to be fully happy and answered that nothing was missing for them to be happy. Although this may seem to be a positive result, it may also suggest that people dedicate little time to thinking about themselves. As a result, they do not acknowledge the basic needs of personal growth and accomplishment. Approximately 20% of patients under adjuvant treatment and cancer survivors reported needing nothing else to be happy. This finding may be seen as a form of gratitude to God for being alive; the fact that these individuals overcame, at least temporarily, a threatening condition such as cancer may prevent them from complaining in the presence of an interviewer.

Traditionally, qualitative studies are not based on a statistical sample size calculation. However, the present study consisted of a secondary analysis of data collected in a larger, quantitative study with a calculated sample size. In any case, the robust sample size of this study is relevant when considering the intention to investigate the prevalence of narratives among different groups. Although qualitative studies usually analyze long narratives from a few interviewees, the present one was based on short narratives from a large number of participants.

7.6.5 Study Limitations

The present study has several limitations. First, study populations were subjected to different data collection methods. Live responses to an interview - even when duly trained not to interfere in the responses - may be considered a source of bias. In addition, studied populations are distinct from one another, not differing only in function of being a patient with cancer or an informal caregiver. Thus, other conditions related to lifestyle, income, and age should be involved in the pursuit of happiness. Another limitation of the present study, because of its cross-sectional methodology, is the impossibility of evaluating how the perception of what happiness is changes over time.

7.6.6 Conclusions

While cancer patients and informal caregivers desire better health and a cure to be happy, individuals from the general population wish for money, work, and better interpersonal relationships. Among cancer patients, the profile of survivors tended to be similar to that of the general population concerning what they need to be happy. In simple terms, individuals tend to seek what they consider to be important for their lives, but it is missing at the present time. Because it was a crossectional study, these were the results found at the time of the research. Additional studies are needed to correlate indices of happiness with perceptions of the pursuit of happiness and to assess the impact of such findings on clinical outcomes over time and among other populations. Psychoeducational and cognitive behavioral strategies focused on how to deal with life expectations among people facing cancer are awaited, as well as how values are restructured and how life is perceived, which can influence how these individuals conceive of happiness.

7.6.7 Acknowledgments

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Table 1. Socio-demographic characteristics of study participants (n=2580).

Characteristics	**Cancer Patients (n=342)**	**Informal caregivers (n=126)**	**General Population (n=2112)**
	n (%)	**n (%)**	**n (%)**
Gender			
Male	122 (35.7)	28 (22.2)	470 (22.3)
Female	220 (64.3)	98 (77.8)	1642 (77.7)
Race (ethnicity)			
White	207(60.5)	39 (31.0)	1483 (70.2)
Black	30 (8.8)	18 (14.3)	83 (3.9)
Mulatto	90 (26.3)	67 (53.2)	476 (22.5)
Asian	07 (2.1)	02 (1.6)	55 (2.7)
Missing	08 (2.3)	00 (0.0)	15 (0.7)
Age (years)			
18-29	17 (5.0)	28 (22.2)	938 (44.4)
30-39	24 (7.0)	42 (33.3)	699 (33.1)
40-49	68 (19.9)	19 (15.1)	277 (13.1)
50-59	124 (36.3)	27 (21.4)	141 (6.7)
60-69	78 (22.8)	08 (6.3)	47 (2.2)
≥70	30 (8.8)	02 (1.6)	10 (0.5)
Missing	01 (0.2)	00 (0.0)	00 (00)
Marital Status			
Married or live married	189 (55.3)	75 (59.5)	1002 (47.4)
Windowed	35 (10.2)	05 (4.0)	24 (1.2)
Separated or divorced	48 (14.0)	08 (6.3)	123 (5.8)
Single	64 (18.7)	38 (30.2)	951 (45.0)
Other / Do not Know	06 (1.8)	00 (0.0)	12 (0.6)
Region where live			
North	19 (5.6)	57 (45.2)	168 (8.0)
Northeast	06 (1.8)	18 (14.3)	240 (11.4)
Southeast	264 (77.2)	00 (0.0)	964 (45.6)
Midwest	46 (13.5)	48 (38.1)	179 (8.5)
South	07 (2.0)	03 (2.4)	561 (26.6)
Location where live			
Urban Area	312 (91.2)	101 (80.2)	2060 (97.5)
Rural Area	30 (8.8)	25 (19.8)	52 (2.5)
Educational Level			
<8 years	186 (54.4)	47 (37.3)	26 (1.2)
8 to 11 years	77 (22.5)	54 (42.9)	218 (10.3)
>11 years	79 (23.1)	25 (19.8)	1866 (88.4)
Missing	00 (0.0)	00 (0.0)	02 (0.1)
Professional activity currently			
Yes	282 (82.5)	115 (91.3)	2030 (96.1)
No	60 (17.5)	11 (8.7)	82 (3.9)

Table 2. Frequency of categories and subcategories found in the narrative analysis per group.

Categories and subcategories[1]	Full sample n=2,038 n (%)	Type of participant			
		Cancer patients (n=242) n (%)	Informal caregivers (n=125) n (%)	General population (n=1,671) n (%)	*P-Value*[b]
Category 1. Nothing	232 (11.4)	45 (18.6)	20 (16.0)	166 (9.93)	<0.001
Category 2. Better Health	288 (14.1)	115 (47.5)	68 (54.4)	105 (6.3)	<0.001
Subcategory 2a. Cure	73 (3.6)	19 (7.8)	31 (24.8)	23 (1.4)	<0.001
Category 3. Interpersonal relationships	456 (22.4)	20 (8.2)	31 (24.8)	405 (24.2)	<0.001
Subcategory 3a. Romantic relationship	186 (9.1)	7 (2.9)	7 (5.6)	172 (10.2)	<0.001
Subcategory 3b. Building a family	170 (8.3)	3 (1.2)	6 (4.8)	161 (9.6)	<0.001
Subcategory 3c. Family closeness	88 (4.3)	3 (1.2)	15 (12.0)	70 (4.1)	<0.001
Category 4. To “have” to “be”	524 (25.7)	54 (22.3)	17(13.6)	453 (27.1)	0.002
Subcategory 4a. Money	412 (20.2)	33 (9.6)	10 (8.0)	369 (22.1)	<0.001
Subcategory 4b. Material things	145(7.11)	24(9.9)	7(5.6)	114(6.8)	0.165
Category 5. Spirituality	59 (2.9)	1 (0.4)	1 (0.8)	57 (3.4)	0.007[a]
Category 7. Leisure and rest	106 (5.2)	3 (1.2)	1 (0.8)	102 (6.1)	<0.001[a]
Category 8. Work	481 (23.6)	12 (4.9)	9 (7.2)	460 (27.5)	<0.001[a]
Subcategory 8a. Learning goals	111 (5.4)	2 (0.8)	2 (1.6)	107 (6.4)	<0.001 [a]

[1] Names of categories are abbreviated

[a] Fisher’s exact test

[b]Chi-square test

Table 3. Frequency of categories and subcategories found in the analysis of narratives of cancer patients.

Categories and subcategories	Cancer patients (n=242)			*P-Value*
	Survivors n (%)	**Adjuvant Treatment n (%)**	**Exclusive Palliative Care n (%)**	
Category 1. Nothing	21 (21.0)	22 (22.4)	2 (4.5)	<0.001
Category 2. Better Health	34 (34.0)	46 (46.9)	35 (79.5)	0.137
Subcategory 2a. Cure	2 (2.0)	7 (7.1)	10 (22.7)	0.046[a]
Category 3. Interpersonal relationships	20 (20.0)	10 (10.2)	2 (4.5)	0.045[a]
Category 4. To “have” to “be”	29 (29.0)	17 (17.3)	8 (18.8)	<0.001
Subcategory 4a. Money	18 (18.0)	10 (10.2)	5 (11.4)	0.012
Subcategory 4b. Material things	12 (12.0)	9 (9.2)	3 (6.8)	0.046[a]

Categories 5, 6, 7 and 8 and subcategories 3a, 3b, 3c, 3d and 8a were not included in the table due to their low frequency among cancer patients.
Subcategories 9a, 9b and 9c were not subjected to statistical analysis because they did not occur among cancer patients.

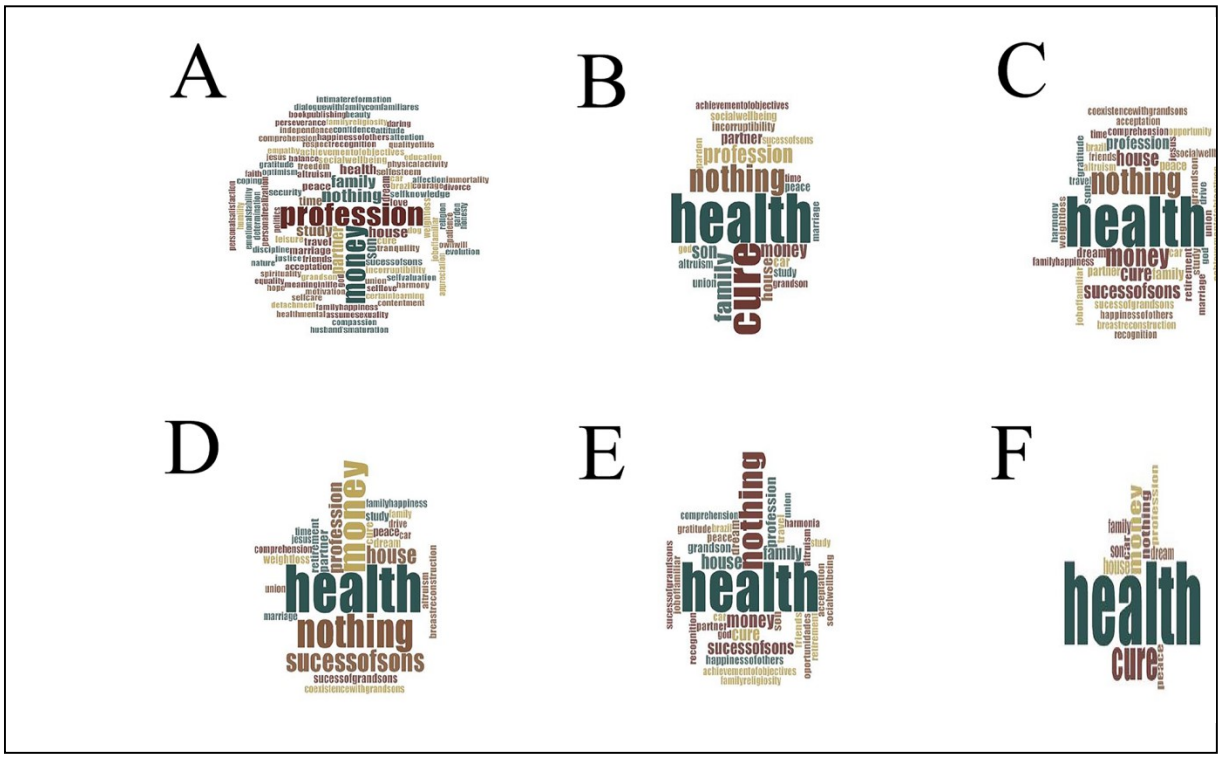

Fig. 1. Word clouds generated using participants' statements concerning their pursuit of happiness. a) Healthy population; b) informal caregivers; c) cancer patients; d) cancer patients, survivors; e) cancer patients, adjuvant treatment; f) cancer patients, exclusive palliative care.

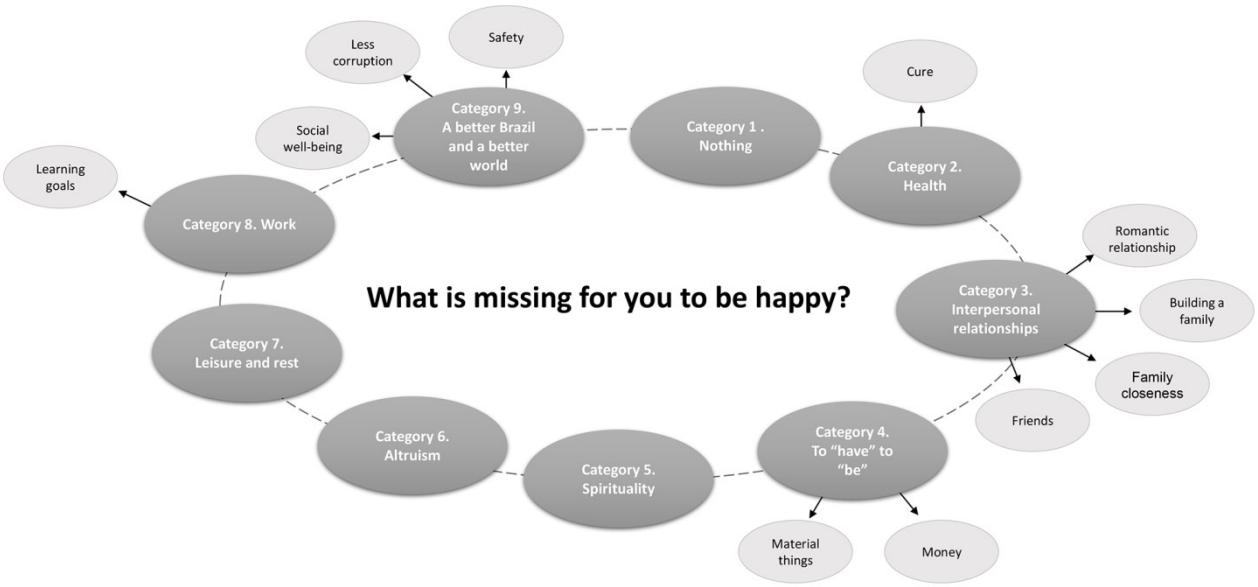

Fig. 2. Graphically description of categories and subcategories based on participants' statements. Categories and subcategories are shown in dark gray circles and light gray circles, respectively. At the center of the figure is the open question of the study ''What is missing for you to be happy?'

8 ARTIGO 5

Carta ao Editor segundo as normas do Periódico *Revista da Associação Médica Brasileira* (ISSN: 0104-4230), Fator de Impacto: 0.801, submetido em 01/09/2019.

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8.1 Avaliação dos Índices de Desenvolvimento Humano (IDH), Vulnerabilidade Social (IVS) referentes à cidade onde os participantes residiam e percentual de participantes felizes por região do Brasil.

8.1.1 Felicidade e satisfação com a vida: potenciais indicadores sociais para mensuração periódica no Brasil?

Prezado Editor:

Em essência, todos os seres humanos estão em busca da felicidade; um construto multidimensional e complexo, resultante de experiências individuais subjetivas[1]. Desta forma, torna-se desafiador comparar dados sobre a felicidade e suas medidas multidimensionais entre diferentes culturas e populações específicas[1]. Os estudos sobre felicidade têm ganhado cada vez mais atenção, não apenas por parte dos pesquisadores, mas também em debates jornalísticos e políticos, isso porque os índices de felicidade são utilizados também como indicadores de crescimento econômico e desenvolvimento social, já sendo contemplados inclusive em políticas públicas de diversos países[2].

A Rede de Soluções para o Desenvolvimento Sustentável, vinculado à Organização das Nações Unidas (ONU), divulga desde 2013, o *ranking* global de felicidade denominado *World Happiness Report***.** Ele tem como base o quanto as pessoas se consideram felizes, todavia estima também o quanto dessa felicidade é influenciado pelo Produto Interno Bruto (PIB) per capita, políticas públicas, expectativa de vida, generosidade, níveis de corrupção e liberdades individuais[2]. Dentre um total de 156 países, o Brasil ocupou o 22º, 28º e 32º lugares em 2017, 2018 e 2019, respectivamente. A melhor classificação foi registrada em 2014, quando ocupou o 17° lugar[2]. Desta forma, percebe-se que o Brasil ainda não está

entre os países com maiores níveis de felicidade, indicando um potencial para melhorar o planejamento e desenvolvimento de políticas públicas voltadas a este propósito[2].

Nosso grupo de pesquisa em Qualidade de Vida tem avaliado os índices de felicidade e satisfação com a vida de profissionais de saúde, estudantes, pacientes crônicos e seus cuidadores. Recentemente, avaliamos os índices de felicidade e satisfação com a vida em uma amostra da população geral brasileira que utilizava mídias sociais. Para tanto, os participantes responderam o Índice de Felicidade de Pemberton (PHI) e Escala de Satisfação com a Vida (ESV), devidamente validados para uso em Português/Brasil[3]. Identificamos que dos 2.151 participantes, 1.311 (60.9%) eram considerados felizes. As regiões Norte (63.2% [CI95%:56-70]), Nordeste (62.1% [CI95%:56-68]) e Centro-Oeste (60.4% [CI95%:53-68]) não apresentaram diferença entre si e em relação às demais. Contudo, embora sejam análises apenas de usuários de mídias sociais, os resultados apontaram que as pessoas residentes na região Sul (66.9% [CI95%:63-71]) reportaram ser mais felizes que as do Sudeste (56.9% [CI95%:54-60]). O Sul do Brasil, que historicamente recebe influência da colonização europeia, já vinha apresentando, em outros estudos, índices de felicidade acima das médias[4, 5].

A maior parte dos participantes residia em municípios com alto índice de desenvolvimento humano (IDH; n=1361; 63.3%) e baixo índice vulnerabilidade social (IVS; n=1373; 63.8%). As classificações do IDH dos municípios não influenciaram nas médias de felicidade e satisfação com vida, entretanto, os participantes eram menos satisfeitos em cidades com maior IVS (**Tabela 1**).

O IVS avalia a inexistência ou deficiência de recursos indispensáveis para o bem-estar e qualidade de vida da população, configurando então, situações de vulnerabilidade social; quanto maior o índice, maior a vulnerabilidade. Em 2010, o IVS brasileiro era de 0.326, e diminuiu para 0.243 (em 2014) e 0.248 (em 2015)[6].

As divulgações referentes aos resultados deste estudo poderiam estimular gestores na otimização de políticas públicas oportunas à realidade de cada localidade, seja em macrorregiões ou unidades menores, a fim de beneficiar a qualidade de vida e, consequentemente, a satisfação com a vida de populações mais vulneráveis. Além do mais, acreditamos que as mensurações de felicidade e construtos associados, devem ser consideradas como potenciais indicadores sociais para avaliação periódica em nosso país.

Tabela 1 - Médias de felicidade e satisfação com a vida em função dos Índices de Desenvolvimento Humano (IDH) e Índices de Vulnerabilidade Social (IVS) referentes às cidades em que os participantes residiam.

Variável	IDH e IVS	Média (DP)	Mediana (Mínimo-Máximo)	p-Valor
Felicidade[a]	***IDH***			0.076
	Muito baixo/Baixo	7.50 (2.12)	8.18 (2.18 - 10.00)	
	Médio	7.18 (1.79)	7.55 (2.00 - 10.00)	
	Alto	6.91 (2.01)	7.45 (0.09 - 10.00)	
	Muito Alto	7.12 (1.82)	7.64 (0.18 - 10.00)	
	IVS			0.392
	Muito baixo	7.08 (1.89)	7.55 (0.27 - 10.00)	
	Baixo	6.99 (1.94)	7.55 (0.09 - 10.00)	
	Médio	6.85 (2.05)	7.27 (0.64 - 10.00)	
	Alto/Muito Alto	7.22 (2.11)	8.00 (2.18 - 10.00)	
Satisfação com a vida [b]	***IDH***			0.759
	Muito baixo/Baixo	25.26 (6.64)	25.00 (13.00 - 35.00)	
	Médio	24.32 (6.65)	26.00 (7.00 - 35.00)	
	Alto	24.65 (6.75)	26.00 (5.00 - 35.00)	
	Muito Alto	24.91 (6.64)	26.00 (5.00 - 35.00)	
	IVS			0.004
	Muito baixo	25.55 (6.51)	27.00 (5.00 - 35.00)	
	Baixo	24.63 (6.71)	26.00 (5.00 - 35.00)	
	Médio	23.76 (6.93)	25.00 (5.00 - 35.00)	
	Alto/Muito Alto	24.17 (6.39)	25.00 (7.00 - 34.00)	

[a]Avaliada pelo Índice de Felicidade de Pemberton (PHI).
[b] Avaliada pela Escala de Satisfação com a vida (ESV).
Índice de Desenvolvimento Humano (IDH): Muito Baixo: 0.000 – 0.499/Baixo: 0.500 – 0.599/Médio: 0.600 – 0.699/Alto: 0.700 – 0.799/Muito Alto: 0.800 – 1.000.
Índice de Vulnerabilidade Social (IVS): Muito Baixo: 0.000 – 0.199/Baixo: 0.200 – 0.299/Médio: 0.300 – 0.399/Alto: 0.400 – 0.499/Muito Alto: 0.500 – 1.000.

8.1.1.1 Referências

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9 DISCUSSÃO

A primeira parte desta tese refere-se à validação da *Pemberton Happiness Inde*x (PHI). A versão em português universal da PHI foi inicialmente adaptada culturalmente e depois validada em uma grande amostra da população brasileira. Suas propriedades psicométricas foram consideradas adequadas à luz da Psicometria Clássica. Estudos subsequentes também poderão avaliar a PHI de acordo com Psicometria Moderna, como por exemplo, por meio do Método de Rasch ou Teoria de Resposta aos Itens. Os autores acreditam que o processo de validação é dinâmico e continuado, onde métodos distintos devem se complementar e fomentar robustez às escalas de medidas. Esta validação da PHI deve ser considerada como uma contribuição que poderá ser muito útil em estudos futuros no Brasil e, possivelmente, como indicador social, ao levar em consideração os índices de felicidade como potenciais indicadores a serem mensurados de forma periódica.

Embora a divulgação de links de pesquisa por e-mail ou por meio de compartilhamento de redes sociais *on-line* seja bastante comum, essa estratégia é uma abordagem incomum para a validação de instrumentos para avaliação de saúde. A qualidade de dados coletados por meio de pesquisas "papel e caneta" foram comparadas com aquelas *on-line* por computadores e Internet, utilizando diferentes medidas de bem-estar subjetivo e foram encontrados resultados equivalentes entre os diferentes métodos de coleta de dados[133] . Dada a crescente prevalência de redes sociais *on-line*, os futuros estudos de validação de questionários podem tirar proveito da rápida disseminação de pesquisas *on-line*.

Os resultados das análises das propriedades psicométricas da versão em português universal da PHI foram bastante semelhantes aos relatados no estudo de Hervás e Vázquez[116]. Os valores de alfa de Cronbach observados no estudo (0,890 e 0,914) foram muito semelhantes aos relatados no estudo original, que variou de 0,82 a 0,93. Além disso, em geral, a validade convergente/divergente e os índices de grupos conhecidos foram considerados adequados.

O ponto de corte estabelecido para a identificação de indivíduos felizes pode ser útil em futuros estudos de base populacional, utilizando a PHI como instrumento para avaliar a felicidade. Nesse caso, sugerimos que os escores da PHI acima de 7 possam ser considerados adequados, provisoriamente, para identificar um indivíduo brasileiro "feliz". No entanto, mais estudos são necessários para confirmar a validade desse valor de corte em diferentes

populações. Além do ponto de corte, a identificação da diferença mínima clinicamente importante (DMCI) também pode ser útil.

Em sequência nesta tese, foram identificadas algumas condições associadas à felicidade e satisfação com a vida, relacionados principalmente a atividades que permitem interação social e satisfação pessoal. As principais incluem satisfação com aspectos financeiros, autoavaliação da saúde, frequência de reuniões familiares, prática de atividades físicas e diagnósticos prévios de problemas psicológicos/psiquiátricos.

Embora a renda familiar estivesse associada à maior satisfação com a vida, a satisfação pessoal com aspectos financeiros parecia ser mais relevante, pois estava positivamente associada à felicidade e satisfação com a vida. Quanto dinheiro o indivíduo ganha sozinho não prevê satisfação em outras áreas da vida [162, 163]. Por isso, é possível encontrar pessoas felizes com rendimentos muito baixos, o que poderia explicar por que eles experimentam grande satisfação em outras áreas de suas vidas[164, 165]. No entanto, sabe-se que existe uma relação positiva entre a satisfação financeira da família e a felicidade[166]. A transição da pobreza para a renda moderada é fundamental para uma família atender às suas necessidades básicas[167]. Após atender às necessidades básicas, no entanto, a renda adicional não atende às necessidades mais profundas de maneira duradoura, pelo menos quando é direcionada à aquisição de mais bens materiais[168]. Compras experienciais (como férias, viagens, shows e refeições fora de casa) tendem a trazer felicidade mais duradoura do que compras materiais. Isso ocorre porque, comparadas aos bens materiais, as experiências são menos propensas à adaptação hedônica[169].

A autoavaliação da saúde, foi positivamente associada à felicidade[164, 166, 170-172], mesmo após os resultados dos estudos serem controlados por fenômenos socioeconômicos relevantes[164, 173, 174]. O que importa na auto avaliação da saúde, que é uma avaliação subjetiva do indivíduo, é o seu sentimento de estar com saúde boa ou ruim, independentemente do número real de doenças presentes[164, 171, 175].

Já havia evidências de uma associação entre relações familiares positivas e felicidade[170, 176]. As relações familiares são fundamentais para fornecer, entre outras coisas, apoio financeiro e emocional e, consequentemente, apoio social e psicológico[170]. A busca pela harmonia familiar, inclusive, é considerada um importante propósito da vida que também é essencial para manter a felicidade dos indivíduos, independentemente da cultura e faixa etária[177].

Evidências científicas indicam que a prática de atividade física também está correlacionada positivamente com os escores de felicidade[178-180]. Essa felicidade poderia estar relacionada a interações sociais subjacentes, já que há relatos de mais afetos positivos quando os indivíduos estão em situações sociais[181]. A atividade física, provavelmente também está ligada à felicidade por processos internos e fisiológicos, pois proporciona um efeito revitalizante, o que pode aumentar a disponibilidade de recursos para a busca de objetivos pessoais[182].

A satisfação com a vida também está fortemente influenciada pela saúde mental[183 184]. Importante destacar que ser feliz não é necessariamente o oposto de estar deprimido. Em qualquer caso, parece natural supor que a felicidade está associada negativamente a traços emocionais negativos, bem como outros transtornos mentais. Os resultados deste estudo corroboram com pesquisas anteriores que mostraram que os diagnósticos de depressão ou ansiedade estão associados a menores níveis de felicidade[179, 185].

Foi evidenciado que 60.9% dos participantes brasileiros da população geral eram considerados felizes. As regiões Norte, Nordeste e Centro-Oeste não apresentaram diferença entre si e em relação às demais. Contudo, embora sejam análises apenas de usuários de mídias sociais, os resultados apontaram que as pessoas residentes na região Sul reportaram ser mais felizes que as do Sudeste. O Sul do Brasil, que historicamente recebe influência da colonização europeia, já vinha apresentando, em outros estudos, índices de felicidade acima das médias[186, 187]. As classificações do IDH dos municípios não influenciaram nas médias de felicidade e satisfação com vida, entretanto, os participantes eram menos satisfeitos em cidades com maior IVS.

O IVS avalia a inexistência ou deficiência de recursos indispensáveis para o bem-estar e qualidade de vida da população, configurando então, situações de vulnerabilidade social; quanto maior o índice, maior a vulnerabilidade[188]. As divulgações referentes aos resultados deste estudo poderiam estimular gestores na otimização de políticas públicas oportunas à realidade de cada localidade, seja em macrorregiões ou unidades menores, a fim de beneficiar a qualidade de vida e, consequentemente, a satisfação com a vida de populações mais vulneráveis. Além do mais, acreditamos que as mensurações de felicidade e construtos associados, devem ser consideradas como potenciais indicadores sociais para avaliação periódica em nosso país.

Neste estudo também foram mensuradas as percepções de felicidade, satisfação com a vida e afetos positivos e negativos de uma amostra de pacientes com câncer e cuidadores informais de pacientes oncológicos e comparadas com as percepções de indivíduos saudáveis da população geral usuários de redes sociais. Análises de regressão linear confirmaram a associação de várias características pessoais, de saúde, financeiras e de trabalho, atividades de lazer e descanso com maiores percepções de felicidade, satisfação com a vida e afetos positivos. Mesmo após o ajuste para idade, sexo, renda e educação, pacientes com câncer e cuidadores informais eram mais felizes em comparação com pessoas saudáveis da população em geral. Curiosamente, pacientes e cuidadores apresentaram menores escores de afeto positivo e maiores escores de afeto negativo. Os resultados nos levaram a formular o conceito de que mesmo com mais problemas na vida cotidiana (que geram mais afetos negativos), indivíduos que sofrem de câncer ou com um ente querido portador de câncer, se sentem mais felizes e mais satisfeitos com a vida devido à mudança de expectativas futuras e valorizando aspectos mais simples da vida cotidiana.

Os modelos de regressão linear explicaram entre 54% e 65% da variância nos escores de felicidade, satisfação com a vida e afetos positivos e negativos dos participantes, sugerindo que o percentual remanescente de variância pode ser explicado por fatores genéticos ou de personalidade, aspectos específicos, que não foram investigados[43, 63, 64].

As características associadas aos maiores escores de felicidade aumentam a natureza multidimensional do construto “felicidade”. Para uma adequada compreensão dos resultados deste estudo, deve-se enfatizar que as escalas utilizadas tendem a medir constructos ligeiramente diferentes. A Escala de Afetos Positivos e Negativos (EAPN) é composta por perguntas mais diretas e investiga aspectos mais transitórios da vida. A ESV e a PHI-r incluem questões mais reflexivas, abordando aspectos existenciais. Essas diferenças explicam por que pacientes e cuidadores informais têm menos afetos positivos e mais negativos e, simultaneamente melhores escores de felicidade e satisfação com a vida, o que à primeira vista pareceria ilógico. Para validar esse achado, foi realizada uma análise diferente. Escores de itens que avaliam "crescimento pessoal" e "significado de vida", bem como o item que mede "capacidade de desfrutar de pequenas coisas na vida diária", foram maiores entre os pacientes e cuidadores em comparação com pessoas saudáveis. Mais uma vez, pacientes e cuidadores relataram maior pontuação de "maus momentos na vida diária", quando comparados com pessoas saudáveis.

Os resultados deste estudo sugerem que o sofrimento (próprio e/ou de alguém próximo), embora indesejável, tem um papel no crescimento pessoal de indivíduos saudáveis ou portadores de doenças crônicas (como o câncer)[189-192]. Nos pacientes oncológicos que receberam cuidados paliativos exclusivos, a percepção de felicidade e satisfação com a vida foi reduzida em comparação com os outros grupos de pacientes com câncer, como esperado. Nesses pacientes, as questões físicas (dor, fadiga, náusea, dispneia, entre outros) e o sofrimento psicossocial são altos, principalmente no final da vida. Após o controle adequado dos sintomas físicos e psicológicos, as estratégias voltadas para a resolução de problemas, questões pessoais, perdão e terapia de dignidade poderiam desempenhar um papel fundamental no domínio existencial. Se administrados adequadamente, esses pacientes provavelmente relatarão maiores índices de satisfação com a vida e felicidade. No entanto, essa hipótese precisa ser testada em estudos futuros.

Assim, a literatura sugere que pessoas de países coletivistas (como o Brasil) busquem estratégias de regulação de emoções que promovam o individualismo e o autoconhecimento[193]. No presente estudo, no momento da crise emocional (diagnóstico de câncer), os participantes brasileiros apresentaram maiores escores de felicidade e satisfação com a vida, o que pode sugerir que a busca do autoconhecimento e da individualização poderiam levar ao crescimento pessoal. No entanto, estudos subsequentes precisariam ser elaborados para explicar esses achados.

Buscou-se também analisar e comparar o que pacientes com câncer, cuidadores informais e população geral consideravam que os deixariam mais felizes. No geral, os participantes buscavam melhor saúde, melhores relações interpessoais, dinheiro e aspectos relacionados ao trabalho. Pacientes com câncer e cuidadores informais buscavam melhor saúde e cura com mais frequência do que quando comparados a pessoas saudáveis. Entre os pacientes com câncer, o perfil dos sobreviventes tendia a ser semelhante ao da população saudável em relação ao que eles precisariam para serem felizes. Inesperadamente, a cura foi mais frequente entre os participantes com câncer incurável.

A maior parte da população geral saudável era composta indivíduos com menos de 40 anos, o que pode ser responsável por seu foco em questões profissionais e financeiras. Como as atividades relacionadas ao trabalho representam uma parte muito grande da vida cotidiana, os indivíduos podem acreditar que a satisfação com a vida profissional tem um impacto substancial na felicidade deles[194].

Curiosamente, a categoria relacionada a relações interpessoais foi menos frequente em pacientes em tratamento adjuvante ou em cuidados paliativos exclusivos. Apesar de relacionamentos interpessoais serem importantes para a felicidade[195, 196], os pacientes com câncer podem ter outras prioridades, como tratamento e saúde e, portanto, não consideram o relacionamento interpessoal como um fator importante. Além disso, a literatura evidencia a melhoria das relações familiares e de amizade durante o processo de doença oncológica[197], sugerindo que, na presença de uma doença ameaçadora, amigos e/ou familiares já estejam próximos, o que contribui para a baixa frequência dessa categoria entre esses dois subgrupos.

Mudanças perceptíveis nas prioridades de valores pessoais são relatadas após um diagnóstico de câncer. Tais mudanças podem ser consideráveis e levar pacientes e cuidadores informais a reestruturarem seus valores e como eles percebem a vida. Isso também pode influenciar a maneira como esses indivíduos concebem a felicidade, com possíveis mudanças em suas expectativas para o futuro e atribuição de mais valor a aspectos mais simples da vida cotidiana[191, 192]. Essas mudanças também podem refletir incerteza sobre o futuro, o que faz com que indivíduos, como pacientes com doenças crônicas, se concentrem principalmente no presente e no que consideram estar faltando[195, 198].

Ainda em relação ao que os indivíduos buscam para ser felizes, a categoria relacionada ao desejo saúde foi citada com grande frequência por todos os grupos e subgrupos, exceto pela população geral. Outros estudos evidenciam a busca pela saúde como um dos fatores significativos para aumentar a felicidade entre pacientes com doenças crônicas e seus cuidadores[195]. Embora pareçam óbvio, esses achados mostram que as pessoas buscavam o que estava faltando nos dias atuais, no momento em que responderam à pesquisa. Como resultado, um indivíduo pode atribuir pouco valor à sua própria saúde (comportamento sedentário, tabagismo etc.), mas acaba desejando muito (na busca pela felicidade) quando está doente.

Surpreendentemente, a subcategoria relacionada à cura, foi mencionada com mais frequência por pacientes em cuidados paliativos exclusivos, ou seja, por aqueles que não têm chance de ser curados. Esse achado aponta para uma inconsistência entre a consciência do prognóstico e a percepção da intenção do tratamento/cuidado recebido[199, 200]. Alguns fatores, isoladamente ou em conjunto, podem explicar essa expectativa irrealista[201], como resistência à aceitação[202, 203], negação[204, 205], dificuldade em entender informações

prognósticas[206, 207] e, lacunas na comunicação dos profissionais de saúde, que frequentemente enfrentam o estigma de dar más notícias[208, 209], em relação aos verdadeiros objetivos dos cuidados paliativos exclusivos.

A categoria “Ter algo para ser mais feliz”, foi mencionada principalmente pela população em geral e pelos sobreviventes de câncer. Uma hipótese razoável para explicar esse achado é que os sobreviventes de câncer gradualmente se aproximam da população em geral ao longo do tempo em termos de qualidade de vida geral[210, 211] e bem-estar[212]. A busca da felicidade, no que se refere à aquisição de coisas consideradas ausentes, pode ser semelhante entre esses dois grupos.

Independentemente do grupo em que estavam inseridos, no geral, os participantes buscavam a felicidade naquilo que consideravam importante para suas vidas, mas era algo que eles não tinham no momento da entrevista.

10 CONCLUSÕES

A versão em português universal da PHI é válida e confiável para uso na população brasileira por meio de pesquisas on-line. O ponto de corte para definir um indivíduo feliz foi definido, mas a identificação da diferença mínima clinicamente importante deve ser investigada em estudos futuros.

Estar satisfeito com aspectos financeiros, ter uma percepção positiva na própria auto avaliação da saúde, ter reuniões familiares frequentes, praticar atividades físicas ≥3 vezes por semana e não ter um diagnóstico prévio de problemas psicológicos/psiquiátricos são variáveis que influenciam, de forma positiva, a percepção de felicidade da população geral.

Pacientes com câncer e cuidadores informais relataram níveis mais altos de felicidade e satisfação com a vida em comparação com pessoas saudáveis, embora tivessem menores escores de afeto positivo e maiores escores de afeto negativo. Esses indivíduos provavelmente estão experimentando mais dificuldades (sofrimento) na vida diária. No entanto, dada a sua condição, eles percebem a vida de forma diferente e relatam ser mais felizes. Os indivíduos tendem a buscar a felicidade no que consideram importante para suas vidas, mas está faltando no momento presente.

As classificações do IDH dos municípios não apresentaram influência nas médias de felicidade e satisfação com a vida. Em contrapartida, as classificações do IVS exerceram influência somente nas médias de satisfação com a vida dos participantes. A frequência de brasileiros considerados felizes foi maior percentualmente no sul do país, entretanto, diferiu significativamente apenas em relação à região sudeste do Brasil.

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ANEXOS

Anexo A - Supplementary Material 1

Study Recruitment Strategy

Via Facebook

For the application of the instruments of data collection through the social network Facebook, an online program called SurveyMonkey®, acquired legally from the registration on the site (https://pt.surveymonkey.com).

For data collection via Facebook, 3 different methodologies were used. These are described below:

✓ **Methodology 1**: The authors used their personal Facebook pages to share the research post.

✓ **Methodology 2:** For this methodology municipalities were selected according to the demographic and IDH profile in each Brazilian state. To promote the research, we created Facebook pages specific to the study entitled "Happiness Research" "Happiness Research II" and "Happiness Research III". 100 individuals from each municipality were invited. When identifying one or more of these, the first contact would be through inbox message on the person's page and friend request.

✓ **Methodology 3:** Researchers from the North, Northeast, Midwest and South regions were contacted, without links with the researchers of this study, to be the "pole" of dissemination of the research, in order to carry out the same process of methodology 1 with the objective of propagating research and reach populations outside the southeast region and reach a significant number of cities in Brazil.

Via WhatsApp

Some contacts known to researchers residing in different regions of the country were contacted through the WhatsApp application. Explanatory text about the study was sent together with the research link. In addition to being asked to respond to the questionnaire online, they were encouraged to share the study text/link with their WhatsApp contacts.

Anexo B - Supplementary Material 2. Questionnaire of socio-demographic, clinical characterization and questions potentially associated to the sensation of happiness

Questionnaire of socio-demographic, clinical characterization and questions potentially associated to the sensation of happiness			
Data completed by the researcher			
1	Study ID	**1**	
2	Initials	**2**	
3	Date of data collection **MM/DD/AAAA**	**3**	
4	Sex **1**- Female **2**- Male	**4**	
5	What race (ethnicity) do you consider yourself? **1**-White **2**- Black **3**- Latino **4**- Asian **5**- Other _____	**5**	
6	How old are you (in years)? **1-** <18 **2**- 18-29 **3**- 30-39 **4**- 40-49 **5**- 50-59 **6**- 60-69 **7**- 70-79 **8**- ≥80	**6**	
7	What is your current marital status? **1-** Married or live married **2-** Widowed **3-** Separated or divorced **4-** Single **5-** Do not know answer **6-** Other_____	**7**	
8	What is your educational level (even when you studied)? **1-** I never studied **2-** I never studied, but I can read and write **3-** I stopped studying before the fourth grade **4-** I completed the fourth grade **5-** I stopped studying before the eighth grade **6-** I completed the eighth grade **7-** I stopped studying before the third year **8-** I completed the third year **9-** I started, but I did not finish a college **10-** I finished college **11-** I did Post-Graduation **12-** Other _____	**8**	
09	Do you feel happy with your professional activity? **1**- Nothing **2**- Very little **3**- More or less **4**- Fairly **5**- Extremely	**09**	
10	What state do you live in? **1-** Acre (AC) **2-** Alagoas (AL) **3-** Amapá (AP) **4-** Amazonas (AM) **5-** Bahia (BA) **6-**Ceará (CE) **7-** Distrito Federal (DF) **8-** Espírito Santo (ES) **9-** Goiás (GO) **10-** Maranhão (MA) **11-** Mato Grosso (MT) **12-** Mato Grosso do Sul (MS) **13-** Minas Gerais (MG) **14-** Pará (PA) **15-** Paraíba (PB) **16-** Paraná (PR) **17-** Pernambuco (PE) **18-** Piauí (PI) **19-** Rio de Janeiro (RJ) **20-** Rio Grande do Norte (RN) **21-** Rio Grande do Sul (RS) **22-** Rondônia (RO) **23-** Roraima (RR) **24-** Santa Catarina (SC) **25-** São Paulo (SP) **26-** Sergipe (SE) **27-** Tocantins (TO)	**10**	
11	Is the place you live in an urban or rural area? **1**- Urban **2**- Rural	**11**	
12	What is the total income of your household (including some kind of government aid)? **1-** Less than de R$788,00 **2-** From R$789,00 to R$1575,00 **3-** From R$1576,00 to R$2363,00 **4-** From R$2364,00 to R$3939,00 **5-** From R$3940,00 to R$7879,00 **6-** From R$7880,00 to R$15.759,00 **7-** More than R$15.760,00	**12**	

13	Do you get some kind of government grant or scholarship? (you can check more than one answer) **0**- I don't receive any **1**- PROUNI (University Program for All) **2**- FIES (Student Funding Program) **3**- Citizen Funding Program **4**- Work Funding Program **5**- Food Funding Program **6**- School Funding Program **7**- Family Funding Program **8**- Olympic Pouch **9**- Cup Funding Program **10**- Permanence Funding Program **11**- Dictatorship grant **12**- Pregnant women grant **13**- Retirement for contribution time **14**- Retirement by age **15**- Retirement due to disability **16**- Sickness Funding Program **17**- Maternity Salary **18**- Confinement aid **19**- Pension by death **20**- Other	13	
14	How satisfied are you with what you have achieved financially in your life to this day? **1-** Nothing satisfied **2-** Very unsatisfied **3-** More or less satisfied **4-** Very satisfied **5-** Extremely satisfied	14	
15	How often do you and your family meet for a family gatherings at home (for example, lunch and family dinner)? **0-** I don't have family **1-** Never **2-** Rarely **3-** Sometimes **4-** Often **5-** Always	15	
16	Do you have any religion? **0-** I don't have **1-** Catholic **2-** Evangelical **3-** Spiritist **4-** Other_____	16	
17	To what extent does your religious or spiritual life influence your happiness? **1**- Nothing **2**- Very little **3**- More or less **4**- Fairly **5**- Extremely	17	
18	Have you done any of the activities below? **1-** Volunteer work to help people or institutions **2-** Financial donation to help people or institutions **3-** I have not done any of these activities	18	
19	Do you have pet (can you mark more than one answer if necessary)? **1-** No **2-** Yes, cat **3-** Yes, dog **4-** Yes, birds **5-** Yes, rabbit **6-** Yes, turtle **7-** Yes, hamster/rabbit/rat **8-** Yes, fish **9-** Yes, other (specify)_____	19	
20	How often do you have the opportunity to stay part of your day in the middle of nature (hiking in parks, rural areas, waterfalls, trails in forests, etc.) **1**- Never **2**- Rarely **3**- Sometimes **4-** Often **5-** Constantly	20	
21	You consider yourself a person: **1**- Pessimistic **2**- Neither optimistic nor pessimistic **3**- Optimistic	21	
22	Considering the people you care about (close friends and family), is anyone currently sick? **1-**Yes **2-** No	22	
23	How much of your happiness has been affected by the illness of the person you care about (close friend or relative)? **1-** Nothing **2-** Very Little **3-** More or Less **4-** Fairly **5-** Extremely **99-** Not Applicable	23	

24	How often have you been performing some kind of physical activity (walking, cycling, soccer, swimming, some kind of fighting, etc.)? **0**- I don't perform physical activity **1**- 1 time per week **2**- 2 times per week **3**-3 times per week **4-** 4 times per week **5-** 5 times per week **6-** 6 times per week **7-** 7 times per week	**24**	
24	How far have you had leisure time (going out for walks, resting time, talking, traveling, theater, movie theater, etc.)? **0-** Nothing **2-** Very Little **3-** More or Less **4-** Fairly **5-** Extremely	**24**	
25	How do you consider your health? **1-** Very poor **2-** Poor **3-** Neither bad nor good **4-** Good **5-** Very good	**25**	
26	Among the health problems below, select the one you are carrying (for which you take some medicine or have a diagnosis made by a doctor): **1-** I do not currently have and never had an important health problem **2-** Cancer (CURRENTLY IN TREATMENT) **3-** Cancer (DIAGNOSED AND WITH TERMINATION OF TREATMENT LESS THAN 5 YEARS AGO) **4-** Cancer (DIAGNOSED AND WITH TERMINATION OF TREATMENT THERE IS MORE THAN 5 YEARS) **5-** Cirrhosis of the liver **6-** Hypertension (High blood pressure) **7-** Coronary problems **8-** Diabetes with complications **9-** Diabetes without complications **10-** Chronic lung problems (COPD, Pulmonary emphysema) **11-** Heart failure **12-** Renal insufficiency with dialysis **13-** Renal insufficiency without dialysis **14-** Stroke sequel **15-** Depression **16-** Anxiety **17-** Panic Syndrome **18-** Another psychiatric or psychological problem **19-** Another health problem_____	**26**	

Anexo C – Supplementary Table 1. Univariate Analysis for the evaluation of characteristics associated with satisfaction with life measured by the Satisfaction With Life Scale (SWLS)

Supplementary Table 1. Univariate Analysis for the evaluation of characteristics associated with satisfaction with life measured by the Satisfaction With Life Scale (SWLS) (n=2151).

Variables	**Median (P25 – P75)**	**p-Value**
Gender		0.335
Male	26 (20-29)	
Female	26 (21-30)	
Race		0.044
White	26 (21-30)	
Black	25 (20-29)	
Latino	25 (19.5-29)	
Asian	27 (20-30)	
Age (years)		0.001
18-29	26 (20-29)	
30-39	26 (21-30)	
40-49	27 (20.5-30)	
50-59	28 (23-31)	
60-69	27 (23.5-30)	
≥70	29 (26-32)	
Marital status		<0.001
Married or live married	27 (23-30)	
Windowed	25 (20-29)	
Separated or divorced	22 (16-28)	
Single	25 (20-29)	
Educational level		0.014
<8 years	25 (16-29)	
8 to 11 years	24 (18-30)	
>11 years	26 (21-30)	
Family income*		<0.001
≤3.9 minimum wages	23 (16-28)	
≥4 minimum wages	27 (22-30)	
Satisfaction with financial issues		<0.001
Little[1]	24 (18-28)	
Much[2]	29 (26-32)	
Has current professional activity		<0.001
Yes	26 (21-30)	
No	21 (14-28)	
Region where live		0.293
Southeast	26 (21-30)	
North	26 (21-29)	
Northeast	25 (19-30)	
Midwest	26 (19-30)	
South	26 (21-30)	
Location where live		0.203
Urban Area	26 (21-30)	
Rural Area	27 (23-30)	
Any Government Funding Program		<0.001
No	26 (21-30)	
Yes	25 (20-29)	

Has any religion		<0.001
Catholic	27 (22-30)	
Evangelic	26 (20-29)	
Spiritist	26 (21-30)	
Other	26 (18-31)	
Atheist / Agnostic / No formal religion	25 (19-29)	
Voluntary activity		<0.001
No	26 (20-30)	
Yes	27 (22-30)	
Voluntary financial donation		<0.001
No	25 (20-29)	
Yes	28 (23-30)	
Has a pet		0.339
No	26 (21-30)	
Yes	26 (20-30)	
Current health problem		<0.001
Yes	25 (19-29)	
No	27 (22-30)	
Previous psychological/psychiatric diagnosis		<0.001
No	26 (21-30)	
Yes	22 (15-25)	
Influence of religious or spiritual life on happiness		<0.001
Little[1]	25 (18-29)	
Much[2]	27 (22-30)	
Self-assessment of health		<0.001
Bad[3]	20 (15-26)	
Good [4]	27 (22-30)	
Frequency of family gatherings		<0.001
Little [5]	24 (18-28)	
Much[6]	28 (23-30)	
Contact with nature		<0.001
Little [5]	26 (20-29)	
Much[6]	28 (23-31)	
Physical activity		<0.001
Don't practice physical activity	25 (18-29)	
1 a 2 times per week	26 (21-30)	
3 or more times per week	28 (23-30)	
Leisure time		<0.001
Little[1]	25 (19-29)	
Much[2]	29 (24-31)	
Feeling of happiness with the professional activity		<0.001
Little[1]	23 (17-27)	
Much[2]	28 (24-31)	
Satisfaction with financial issues		<0.001
Little[1]	24 (18-28)	
Much[2]	29 (26-32)	

**Brazilian minimum wage*

[1]nothing/very little/more or less. [2]fairly/extremely. [3]very poor/poor/neither bad nor good. [4]good/very good. [5]nothing/very little/more or less. [6]many times/always.

Anexo D - Supplementary Table 2. Univariate analysis for the evaluation of happiness-associated characteristics measured by the Pemberton Happiness Index (PHI-r) as a continuous variable

Supplementary Table 2. Univariate analysis for the evaluation of happiness-associated characteristics measured by the Pemberton Happiness Index (PHI-r) as a continuous variable (n=2151).

Variables	**Median (P25 – P75)**	**p-Value**
Gender		0.256
Male	7.64 (6.18-8.45)	
Female	7.45 (5.82-8.45)	
Age (years)		<0.001
18-29	7.27 (5.64-8.27)	
30-39	7.55 (5.91-8.45)	
40-49	7.82 (5.82-8.59)	
50-59	8.09 (7.09-9.09)	
60-69	8.18 (7.00-8.91)	
≥70	8.32 (6.73-9.41)	
Marital Status		<0.001
Married or live married	7.73 (6.09-8.59)	
Windowed	7.68 (5.73-8.91)	
Separated or divorced	7.64 (5.55-8.36)	
Single	7.27 (5.73-8.27)	
Family income*		<0.001
≤3.9 minimum wages	7.09 (5.36-8.27)	
≥4 minimum wages	7.64 (6.09-8.45)	
Has current professional activity		<0.001
Yes	7.55 (6.00-8.45)	
No	6.18 (4.00-8.00)	
Region where live		0.011
Southeast	7.36 (5.45-8.45)	
North	7.55 (6.18-8.55)	
Northeast	7.55 (6.05-8.50)	
Midwest	7.27 (5.27-8.45)	
South	7.64 (6.36-8.55)	
Voluntary activity		0.002
No	7.45 (5.82-8.45)	
Yes	7.82 (6.18-8.64)	
Voluntary financial donation		<0.001
No	7.27 (5.64-8.36)	
Yes	7.91 (6.45-8.73)	
Has a pet		0.497
No	7.55 (6.09-8.45)	
Yes	7.55 (5.77 – 8.45)	
Current health problem		<0.001
Yes	7.18 (5.36-8.27)	
No	7.73 (6.27-8.55)	
Previous psychological/psychiatric diagnosis		<0.001
No	7.55 (6.00-8.45)	
Yes	5.50 (3.09-7.55)	

Influence of religious or spiritual life on happiness		<0.001
Little[1]	7.00 (5.18-8.09)	
Much[2]	7.82 (6.36-8.64)	
Self-assessment of health		<0.001
Bad[3]	5.91 (4.00-7.55)	
Good [4]	7.73 (6.27-8.55)	
Frequency of family gatherings		<0.001
Little [5]	6.91 (5.18-8.00)	
Much[6]	7.91 (6.45-8.73)	
Contact with nature		<0.001
Little [5]	7.36 (5.73-8.36)	
Much[6]	8.09 (6.91-8.82)	
Physical activity		<0.001
Don't practice physical activity	7.09 (5.27-8.27)	
1 a 2 times per week	7.36 (5.91-8.36)	
3 or more times per week	8.00 (6.73-8.73)	
Leisure time		<0.001
Little[1]	7.18 (5.55-8.18)	
Much[2]	8.23 (6.91-8.91)	
Satisfaction with financial issues		<0.001
Little[1]	7.00 (5.27-8.09)	
Much[2]	8.27 (7.27-8.91)	

**Brazilian minimum wage.*
nothing/very little/more or less. [2]fairly/extremely. [3]very poor/poor/neither bad nor good. [4]good/very good. [5]nothing/very little/more or less. [6]many times/always.

Anexo E - Supplementary Table 3. Univariate analysis for the evaluation of happiness associated characteristics measured by Pemberton Happiness Index (PHI-r) Dichotomized

Supplementary Table 3. Univariate analysis for the evaluation of happiness associated characteristics measured by Pemberton Happiness Index (PHI-r) Dichotomized (n=2151).

Variables	**Unhappy (PHI-r<7)**	**Happy (PHI-r≥7)**	**p-Value**
	n (%)	**n (%)**	
Gender			0.056*
Male	169 (20.1)	310 (23.6)	
Female	671 (79.9)	1001 (76.4)	
Race			0.942*
White	591 (70.9)	918 (70.6)	
Black	31 (3.7)	55 (42.2)	
Latino	191 (22.9)	293 (22.5)	
Asian	21 (2.5)	34 (2.6)	
Age (years)			
18-29	418 (49.8)	522 (39.8)	<0.001*
30-39	276 (32.9)	427 (32.6)	
40-49	95 (11.3)	193 (14.7)	
50-59	35 (4.2)	121 (9.2)	
60-69	13 (1.5)	39 (3.0)	
≥70	03 (0.4)	09 (0.7)	
Marital Status			<0.001*
Married or live married	352 (42.3)	668 (51.1)	
Windowed	11 (1.3)	19 (1.5)	
Separated or divorced	46 (5.5)	83 (6.4)	
Single	423 (50.8)	537 (41.1)	
Educational level			0.245*
<8 years	09 (1.1)	26 (2.0)	
8 a 11 years	90 (10.7)	133 (10.2)	
>11 years	741 (88.2)	1150 (87.9)	
Has current professional activity			<0.001*
Yes	790 (94.0)	1278 (97.5)	
No	50 (6.0)	33 (2.5)	
Region where live			0.003*
Southeast	426 (50.7)	563 (42.9)	
North	64 (7.6)	110 (8.4)	
Northeast	91 (10.8)	149 (11.4)	
Midwest	72 (8.6)	110 (8.4)	
South	187 (22.3)	379 (28.9)	
Location where live			0.263*
Urban Area	823 (98.0)	1273 (97.1)	
Rural Area	17 (2.0)	38 (2.9)	
Family income**			<0.001*
≤3.9 minimum wages	212 (25.2)	223 (17.0)	
≥4 minimum wages	628 (74.8)	1088 (83.0)	
Government aid			0.762*
No	704 (83.8)	1106 (84.4)	
Yes	136 (16.2)	205 (15.6)	
Disability retirement			0.318*
No	831 (98.9)	1303 (99.4)	
Yes	9 (1.1)	8 (0.6)	
Sickness aid			0.220*
No	836 (99.5)	1298 (99.0)	

Yes	04 (0.5)	13 (1.0)	
Family Funding Program ("Bolsa Família")			0.035*
No	828 (98.6)	1304 (99.5)	
Yes	12 (1.4)	07 (0.5)	
Has any religion			0.061*
Catholic	404 (48.1)	669 (51.0)	
Evangelic	130 (15.5)	210 (16.0)	
Spiritist	147 (17.5)	247 (18.8)	
Other	11 (1.3)	14 (1.1)	
Atheist / Agnostic / No formal religion	148 (17.6)	171 (13.0)	
Voluntary activity			0.011*
No	667 (79.4)	977 (74.5)	
Yes	173 (20.6)	334 (25.5)	
Voluntary financial donation			<0.001*
No	623 (74.2)	828 (63.2)	
Yes	217 (25.8)	483 (36.8)	
Has a pet			0.322
No	329 (39.2)	542 (41.3)	
Yes	511 (60.8)	769 (58.7)	
Leisure time			<0.001*
Little[1]	664 (79.0)	809 (61.7)	
Much[2]	176 (21.0)	502 (38.3)	
Self-assessment of health			<0.001*
Bad[3]	203 (24.2)	116 (8.8)	
Good[4]	637 (75.8)	1195 (91.2)	
Frequency of family gatherings			<0.001*
Little[5]	438 (52.1)	436 (33.3)	
Much[6]	402 (47.9)	875 (66.7)	
Influence of religious or spiritual life on happiness			<0.001*
Little[1]	405 (48.2)	410 (31.3)	
Much[2]	435 (51.8)	901 (68.7)	
Contact with nature			<0.001*
Little[5]	747 (88.9)	1041 (79.4)	
Much[6]	93 (11.1)	270 (20.6)	
Physical activity			<0.001*
Don't practice physical activity	382 (45.5)	441 (33.6)	
1 a 2 times per week	238 (28.3)	329 (25.1)	
3 or more times per week	220 (26.2)	541 (41.3)	
Feeling of happiness with the professional activity			<0.001*
Little[1]	423 (56.2)	295 (24.1)	
Much[2]	330 (43.8)	931 (75.9)	
Satisfaction with financial issues			<0.001*
Little[1]	676 (80.5)	708 (54.0)	
Much[2]	164 (19.5)	603 (46.0)	
Current health problem			<0.001*
Yes	433 (51.5)	528 (40.3)	
No	407 (48.5)	783 (59.7)	
Previous psychological/psychiatric diagnosis			<0.001*
No	804 (95.7)	1297 (98.9)	
Yes	36 (4.3)	14 (1.1)	

*Chi-Square Test

***Brazilian minimum wage.*

[1]nothing/very little/more or less. [2]fairly/extremely. [3]very poor/poor/neither bad nor good. [4]good/very good. [5]nothing/very little/more or less. [6]many times/always

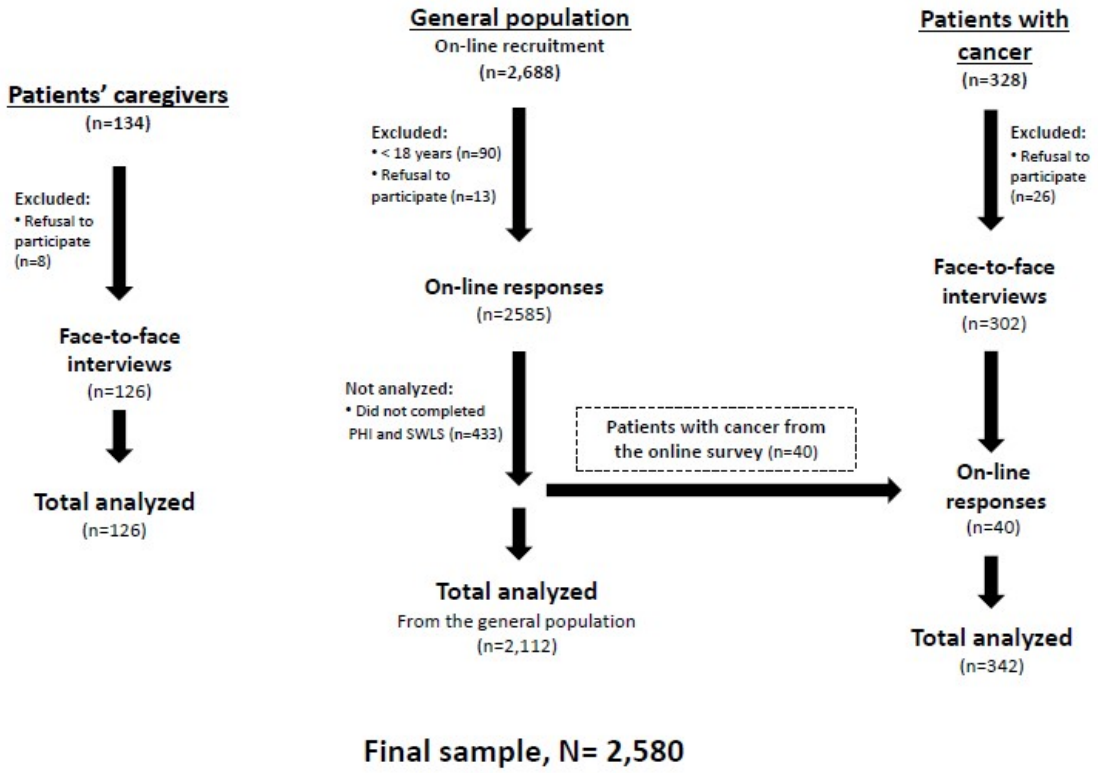
Anexo F - Supplementary Material 1. Questionnaire of socio-demographic, clinical characterization and questions potentially associated to the sensation of happiness

Questionnaire of socio-demographic, clinical characterization and questions potentially associated to the sensation of happiness			
Data completed by the researcher			
1	Study ID	**1**	
2	Initials	**2**	
3	Date of data collection **MM/DD/AAAA**	**3**	
4	Sex **1**- Female **2**- Male	**4**	
5	What race (ethnicity) do you consider yourself? **1**-White **2**- Black **3**- Latino **4**- Asian **5**- Other _____	**5**	
6	How old are you (in years)? **1-** <18 **2**- 18-29 **3**- 30-39 **4**- 40-49 **5**- 50-59 **6**- 60-69 **7**- 70-79 **8**- ≥80	**6**	
7	What is your current marital status? **2-** Married or live married **2-** Widowed **3-** Separated or divorced **4-** Single **5-** Do not know answer **6-** Other_____	**7**	
8	What is your educational level (even when you studied)? **1-** I never studied **2-** I never studied, but I can read and write **3-** I stopped studying before the fourth grade **4-** I completed the fourth grade **5-** I stopped studying before the eighth grade **6-** I completed the eighth grade **7-** I stopped studying before the third year **8-** I completed the third year **9-** I started, but I did not finish a college **10-** I finished college **11-** I did Post-Graduation **12-** Other _____	**8**	
09	Do you feel happy with your professional activity? **1**- Nothing **2**- Very little **3**- More or less **4**- Fairly **5**- Extremely	**09**	
10	What state do you live in? **1-** Acre (AC) **2-** Alagoas (AL) **3-** Amapá (AP) **4-** Amazonas (AM) **5-** Bahia (BA) **6-**Ceará (CE) **7-** Distrito Federal (DF) **8-** Espírito Santo (ES) **9-** Goiás (GO) **10-** Maranhão (MA) **11-** Mato Grosso (MT) **12-** Mato Grosso do Sul (MS) **13-** Minas Gerais (MG) **14-** Pará (PA) **15-** Paraíba (PB) **16-** Paraná (PR) **17-** Pernambuco (PE) **18-** Piauí (PI) **19-** Rio de Janeiro (RJ) **20-** Rio Grande do Norte (RN) **21-** Rio Grande do Sul (RS) **22-** Rondônia (RO) **23-** Roraima (RR) **24-** Santa Catarina (SC) **25-** São Paulo (SP) **26-** Sergipe (SE) **27-** Tocantins (TO)	**10**	
11	Is the place you live in an urban or rural area? **1**- Urban **2**- Rural	**11**	
12	What is the total income of your household (including some kind of government aid)? **1-** Less than de R$788,00 **2-** From R$789,00 to R$1575,00 **3-** From R$1576,00 to R$2363,00 **4-** From R$2364,00 to R$3939,00 **5-** From R$3940,00 to R$7879,00 **6-** From R$7880,00 to R$15.759,00 **7-** More than R$15.760,00	**12**	

13	Do you get some kind of government grant or scholarship? (you can check more than one answer) **0**- I don't receive any **1**- PROUNI (University Program for All) **2**- FIES (Student Funding Program) **3**- Citizen Funding Program **4**- Work Funding Program **5**- Food Funding Program **6**- School Funding Program **7**- Family Funding Program **8**- Olympic Pouch **9**- Cup Funding Program **10**- Permanence Funding Program **11**- Dictatorship grant **12**- Pregnant women grant **13**- Retirement for contribution time **14**- Retirement by age **15**- Retirement due to disability **16**- Sickness Funding Program **17**- Maternity Salary **18**- Confinement aid **19**- Pension by death **20**- Other	13	
14	How satisfied are you with what you have achieved financially in your life to this day? **1-** Nothing satisfied **2-** Very unsatisfied **3-** More or less satisfied **4-** Very satisfied **5-** Extremely satisfied	14	
15	How often do you and your family meet for a family gatherings at home (for example, lunch and family dinner)? **1-** I don't have family **1-** Never **2-** Rarely **3-** Sometimes **4-** Often **5-** Always	15	
16	Do you have any religion? **0-** I don't have **1-** Catholic **2-** Evangelical **3-** Spiritist **4-** Other_____	16	
17	To what extent does your religious or spiritual life influence your happiness? **1**- Nothing **2**- Very little **3**- More or less **4**- Fairly **5**- Extremely	17	
18	Have you done any of the activities below? **1-** Volunteer work to help people or institutions **2-** Financial donation to help people or institutions **3-** I have not done any of these activities	18	
19	Do you have pet (can you mark more than one answer if necessary)? **1-** No **2-** Yes, cat **3-** Yes, dog **4-** Yes, birds **5-** Yes, rabbit **6-** Yes, turtle **7-** Yes, hamster/rabbit/rat **8-** Yes, fish **9-** Yes, other (specify)_____	19	
20	How often do you have the opportunity to stay part of your day in the middle of nature (hiking in parks, rural areas, waterfalls, trails in forests, etc.) **1**- Never **2**- Rarely **3**- Sometimes **4-** Often **5-** Constantly	20	
21	You consider yourself a person: **1**- Pessimistic **2**- Neither optimistic nor pessimistic **3**- Optimistic	21	
22	Considering the people you care about (close friends and family), is anyone currently sick? **1-**Yes **2-** No	22	
23	How much of your happiness has been affected by the illness of the person you care about (close friend or relative)? **1-** Nothing **2-** Very Little **3-** More or Less **4-** Fairly **5-** Extremely **99-** Not Applicable	23	

24	How often have you been performing some kind of physical activity (walking, cycling, soccer, swimming, some kind of fighting, etc.)? **0**- I don't perform physical activity **1**- 1 time per week **2**- 2 times per week **3**-3 times per week **4-** 4 times per week **5-** 5 times per week **6-** 6 times per week **7-** 7 times per week	**24**	
24	How far have you had leisure time (going out for walks, resting time, talking, traveling, theater, movie theater, etc.)? **1-** Nothing **2-** Very Little **3-** More or Less **4-** Fairly **5-** Extremely	**24**	
25	How do you consider your health? **1-** Very poor **2-** Poor **3-** Neither bad nor good **4-** Good **5-** Very good	**25**	
26	Among the health problems below, select the one you are carrying (for which you take some medicine or have a diagnosis made by a doctor): **1-** I do not currently have and never had an important health problem **2-** Cancer (CURRENTLY IN TREATMENT) **3-** Cancer (DIAGNOSED AND WITH TERMINATION OF TREATMENT LESS THAN 5 YEARS AGO) **4-** Cancer (DIAGNOSED AND WITH TERMINATION OF TREATMENT THERE IS MORE THAN 5 YEARS) **5-** Cirrhosis of the liver **6-** Hypertension (High blood pressure) **7-** Coronary problems **8-** Diabetes with complications **9-** Diabetes without complications **10-** Chronic lung problems (COPD, Pulmonary emphysema) **11-** Heart failure **12-** Renal insufficiency with dialysis **13-** Renal insufficiency without dialysis **14-** Stroke sequel **15-** Depression **16-** Anxiety **17-** Panic Syndrome **18-** Another psychiatric or psychological problem **19-** Another health problem_____	**26**	

Anexo G - Supplementary Figura 1. Flowchart of study participant selection



Supplementary Figura 1. Flowchart of study participant selection

Anexo H - Supplementary Material 2. Univariate analysis for the evaluation of characteristics associated with happiness measured by Pemberton Happiness Index (PHI-r)

Supplementary Material 2 – Univariate analysis for the evaluation of characteristics associated with happiness measured by Pemberton Happiness Index (PHI-r) (n=2580).

Variables	Median (P25 – P75)	p-Value
Participants		<0.001
General population	7.55 (5.86 - 8.45)	
Caregivers of cancer patients	8.27 (7.45 - 8.82)	
Cancer patients	8.27 (7.36 - 9.00)	
Age (years)		<0.001
18-29	7.27 (5.73 - 8.27)	
30-39	7.64 (6.09 - 8.45)	
40-49	7.91 (6.55 - 8.73)	
50-59	8.18 (7.18 - 9.09)	
60-69	8.27 (7.27 - 8.82)	
≥70	8.45 (7.55 - 8.91)	
Marital Status		<0.001
Married or live married	7.91 (6.45 - 8.73)	
Windowed	8.23 (7.05 - 9.00)	
Separated or divorced	7.73 (6.45 - 8.64)	
Single	7.36 (5.91 - 8.36)	
Educational Level		<0.001
<8 years	8.36 (7.36 – 9.00)	
8 to 11 years	7.82 (6.55 - 8.73)	
>11 years	7.55 (5.91 - 8.45)	
Feeling of happiness with the professional activity		<0.001
Hasn't professional activity	6.91 (5.00 - 8.27)	
Has professional activity	7.73 (6.27 - 8.64)	
Location where live		<0.001
Urban Area	7.64 (6.09 - 8.55)	
Rural Area	8.27 (6.91 - 9.00)	
Government aid		0.001
Yes	7.82 (6.55 - 8.73)	
No	7.64 (6.09 - 8.55)	
Disability retirement		0.012
No	7.64 (6.18 - 8.55)	
Yes	8.18 (6.82 - 8.91)	
Sickness aid		0.012
No	7.64 (6.09 - 8.55)	
Yes	7.91 (6.82 - 8.86)	
Has any religion		0.003
Catholic	7.73 (6.27 - 8.64)	
Evangelic	7.64 (6.45 - 8.55)	
Spiritist	7.73 (6.00 - 8.64)	
Other	7.41 (5.00 - 8.36)	
Atheist / Agnostic / No formal religion	7.36 (5.64 - 8.36)	
Voluntary activity		<0.001
No	7.55 (6.09 - 8.55)	

Yes	8.00 (6.64 - 8.73)	
Voluntary financial donation		<0.001
No	7.45 (5.82 - 8.45)	
Yes	8.00 (6.82 - 8.82)	
Cat as a pet		0.009
No	7.73 (6.27 - 8.64)	
Yes	7.36 (5.45 - 8.45)	
It is considered		<0.001
Pessimistic	5.55 (3.91 - 6.64)	
Neither optimistic nor pessimistic	6.82 (5.18 - 7.82)	
Optimistic	8.18 (7.09 - 8.82)	
Current health problem		0.002
Yes	7.55 (5.91 - 8.55)	
No	7.82 (6.36 - 8.64)	
Diagnosis and treatment of current cancer		<0.001
No	7.55 (6.00 - 8.45)	
Yes	8.27 (7.36 - 9.00)	
Diagnosis of depression		<0.001
No	7.82 (6.45 - 8.64)	
Yes	5.91 (4.00 - 7.09)	
Diagnosis of anxiety		<0.001
No	7.91 (6.64 - 8.73)	
Yes	6.55 (4.82 - 7.91)	
Diagnosis of panic disorder		<0.001
No	7.73 (6.27 - 8.64)	
Yes	5.45 (4.00 - 7.00)	
Other psychological/psychiatric problem		<0.001
No	7.73 (6.27 - 8.64)	
Yes	5.55 (3.32 - 7.64)	
Influence of religious or spiritual life on happiness		<0.001
Little[1]	7.00 (5.23 - 8.18)	
Much[2]	8.00 (6.73 - 8.73)	
Self-assessment of health		<0.001
Bad[3]	6.82 (4.82 - 8.09)	
Good [4]	7.82 (6.45 - 8.73)	
Frequency of family gatherings		<0.001
Little [5]	7.18 (5.45 - 8.18)	
Much[6]	8.00 (6.73 - 8.82)	
Contact with nature		<0.001
Little [5]	7.45 (5.91 - 8.45)	
Much[6]	8.27 (7.27 - 8.91)	
Physical activity		<0.001
Don't practice physical activity	7.55 (5.82 - 8.45)	
1 a 2 times per week	7.36 (6.09 - 8.36)	
3 or more times per week	8.09 (6.82 - 8.73)	
Leisure time		<0.001
Little[1]	7.36 (5.82 - 8.36)	
Much[2]	8.27 (7.09 - 8.91)	
Feeling of happiness with the professional activity		<0.001
Little[1]	6.82 (5.18 - 8.09)	
Much[2]	8.09 (7.00 - 8.82)	

Satisfaction with financial issues		<0.001
Little[1]	7.18 (5.55 - 8.18)	
Much[2]	8.27 (7.45 - 9.00)	
Happiness affected by loved one's disease		0.003
Little[1]	7.91 (6.36 - 8.73)	
Much[2]	7.55 (6.09 - 8.36)	

[1]nothing/very little/more or less. [2]fairly/extremely. [3]very poor/poor/neither bad nor good. [4]good/very good. [5]nothing/very little/more or less. [6]many times/always.

Anexo I - Supplementary Material 3. Univariate analysis for the evaluation of characteristics associated with satisfaction with life measured by Satisfaction with Life Scale (SWLS)

Supplementary Material 3 – Univariate analysis for the evaluation of characteristics associated with satisfaction with life measured by Satisfaction with Life Scale (SWLS) (n=2580).

Variables	Median (P25 – P75)	p-Value
Participants		<0.001
General population	26 (21-30)	
Caregivers of cancer patients	28 (24-31)	
Cancer patients	28 (23-32)	
Age (years)		<0.001
18-29	26 (20-29)	
30-39	26 (21-30)	
40-49	27 (21-30)	
50-59	28 (23.5-31)	
60-69	28 (24-32)	
≥70	30 (27-34)	
Marital status		<0.001
Married or live married	28 (23-31)	
Windowed	26.5 (21.5-32)	
Separated or divorced	24 (17-29)	
Single	25 (20-29)	
Educational level		<0.001
<8 years	29 (23-33)	
8 to 11 years	26 (19-30)	
>11 years	26 (21-30)	
Family income*		<0.001
≤3.9 minimum wages	25 (18-30)	
≥4 minimum wages	27 (22-30)	
Has current professional activity		<0.001
Yes	27 (21-30)	
No	27 (18-29)	
Feeling of happiness with the professional activity		<0.001
Hasn't professional activity	24 (17-29)	
Has professional activity	27 (22 – 30)	
Region where live		0.046
Midwest	26 (20-30)	
Northeast	25 (19-30)	
North	26.5 (22-30)	
Southeast	27 (22-30)	
South	26 (21-30)	
Location where live		0.004
Urban Area	26 (21-30)	
Rural Area	28 (23-31)	
Family Funding Program ("Bolsa Família")		0.007
No	27 (21-30)	
Yes	21 (16-28)	
Has any religion		<0.001
Catholic	27 (22-30)	

Evangelic	26 (21-29.5)	
Spiritist	27 (22-30)	
Other	25.5 (19-31)	
Atheist / Agnostic / No formal religion	25 (19-29)	
Voluntary activity		<0.001
No	26 (20-30)	
Yes	28 (23-31)	
Voluntary financial donation		<0.001
No	26 (20-29)	
Yes	28 (23-31)	
Cat as a pet		0.003
No	27 (21-30)	
Yes	25 (20-29)	
It is considered		<0.001
Pessimistic	19 (14-25)	
Neither optimistic nor pessimistic	23 (18-28)	
Optimistic	28 (24-31)	
Current health problem		<0.001
Yes	26 (20-30)	
No	27 (22-30)	
Diagnosis and treatment of current cancer		<0.001
No	26 (21-30)	
Yes	28 (23-32)	
Diagnosis of depression		<0.001
No	27 (22-30)	
Yes	20 (14-25)	
Diagnosis of anxiety		<0.001
No	27 (22-30)	
Yes	23 (16-28)	
Diagnosis of panic disorder		<0.001
No	27 (22-30)	
Yes	19 (13-24)	
Other psychological/psychiatric problem		<0.001
No	27 (21-30)	
Yes	22 (15.5-26)	
Influence of religious or spiritual life on happiness		<0.001
Little[1]	25 (18-29)	
Much[2]	28 (23-31)	
Self-assessment of health		<0.001
Bad[3]	22 (16-28)	
Good [4]	27 (23-30)	
Frequency of family gatherings		<0.001
Little [5]	24 (19-28)	
Much[6]	28 (23-31)	
Contact with nature		<0.001
Little [5]	26 (20-30)	
Much[6]	29 (24-32)	
Physical activity		<0.001
Don't practice physical activity	26 (19-30)	
1 a 2 times per week	26 (21-30)	
3 or more times per week	28 (23-31)	

Leisure time		<0.001
Little[1]	25 (20-29)	
Much[2]	29 (25-31)	
Feeling of happiness with the professional activity		<0.001
Little[1]	23 (17-28)	
Much[2]	28 (24-31)	
Satisfaction with financial issues		<0.001
Little[1]	24 (18-28)	
Much[2]	29 (27-32)	
Happiness affected by loved one's disease		<0.001
Little[1]	27 (23-30)	
Much[2]	25.5 (20-30)	

*brazilian minimum wage.

[1]nothing/very little/more or less. [2]fairly/extremely. [3]very poor/poor/neither bad nor good. [4]good/very good. [5]nothing/very little/more or less. [6]many times/always.

Anexo J - Supplementary Material 4. Univariate analysis for the evaluation of characteristics associated with positive affects measured by Diener and Emmon's Positive and Negative Experience Scale (PNES)

Supplementary Material 4 – Univariate analysis for the evaluation of characteristics associated with positive affects measured by Diener and Emmon's Positive and Negative Experience Scale (PNES) (n=2580).

Variables	Median (P25 – P75)	p-Value
Participants		<0.001
General population	25 (20-28)	
Caregivers of cancer patients	22 (19-26)	
Cancer patients	21 (18-23)	
Gender		<0.001
Male	25 (21-29)	
Female	24 (20-27)	
Race		0.049
White	24 (20-28)	
Black	23 (19-27)	
Latino	23 (19-27)	
Asian	25 (21-28)	
Age (years)		<0.001
18-29	24 (20-28)	
30-39	24 (20-28)	
40-49	24 (20-28)	
50-59	22 (19-26)	
60-69	22 (20-25)	
≥70	23 (20-27)	
Marital Status		<0.001
Married or live married	24 (20-28)	
Windowed	21 (17-25)	
Separated or divorced	22 (18.5-26)	
Single	24 (20-28)	
Educational Level		<0.001
<8 years	21 (18-24)	
8 to11 years	23 (19-27)	
>11 years	24 (20-28)	
Family income*		<0.001
≤3.9 minimum wages	22 (19-27)	
≥4 minimum wages	24 (20-28)	
Has current professional activity		0.032
Yes	24 (20-28)	
No	22 (19-26)	
Feeling of happiness with the professional activity		0.046
Hasn't professional activity	23 (18-27)	
Has professional activity	24 (20-28)	
Region where live		0.031
Midwest	23 (19-27)	
Northeast	25 (20-28)	
North	23 (20-27)	
Southeast	23 (20-28)	
South	25 (20-28)	

Any Government Funding Program		<0.001
Yes	23 (19-26)	
No	24 (20-28)	
Retirement due to disability		<0.001
No	24 (20-28)	
Yes	22 (17-24)	
Sickness Funding Program ("Auxílio doença")		<0.001
No	24 (20-28)	
Yes	21 (18-25)	
Has any religion		0.016
Catholic	24 (20-28)	
Evangelic	23 (19-27)	
Spiritist	24 (20-28)	
Other	24 (19.5-29)	
Atheist / Agnostic / No formal religion	23 (19-27)	
Voluntary activity		<0.001
No	23 (20-27)	
Yes	25 (21-29)	
Voluntary financial donation		<0.001
No	23 (19-27)	
Yes	25 (21-29)	
Cat as a pet		0.017
No	24 (20-28)	
Yes	23 (19-28)	
It is considered		<0.001
Pessimistic	18 (15-21)	
Neither optimistic nor pessimistic	21 (18-25)	
Optimistic	25 (22-29)	
Current health problem		<0.001
Yes	22 (19-26)	
No	25 (21-29)	
Diagnosis and treatment of current cancer		<0.001
No	25 (20-28)	
Yes	21 (18-23)	
Diagnosis of depression		<0.001
No	24 (20-28)	
Yes	19 (16-23)	
Diagnosis of anxiety		<0.001
No	24 (20-28)	
Yes	22 (18-26)	
Diagnosis of panic disorder		<0.001
No	24 (20-28)	
Yes	20 (16-25)	
Other psychological/psychiatric problem		<0.001
No	24 (20-28)	
Yes	21 (16-23)	
Influence of religious or spiritual life on happiness		<0.001
Little[1]	23 (19-27)	
Much[2]	24 (20-28)	
Self-assessment of health		<0.001
Bad[3]	20 (17-24)	
Good [4]	25 (21-28)	

Frequency of family gatherings		<0.001
Little [5]	23 (19-26)	
Much[6]	25 (21-29)	
Contact with nature		<0.001
Little [5]	24 (20-27)	
Much[6]	25 (21-29)	
Physical activity		<0.001
Don't practice physical activity	22 (19-26)	
1 a 2 times per week	24 (20-28)	
3 or more times per week	25 (21-29)	
Leisure time		<0.001
Little[1]	22 (19-26)	
Much[2]	27 (23-30)	
Feeling of happiness with the professional activity		<0.001
Little[1]	21 (18-25)	
Much[2]	25 (21-29)	
Satisfaction with financial issues		<0.001
Little[1]	22 (19-26)	
Much[2]	26 (23-29)	
Happiness affected by loved one's disease		<0.001
Little[1]	25 (21-29)	
Much[2]	23 (20-27)	

*brazilian minimum wage.

[1]nothing/very little/more or less. [2]fairly/extremely. [3]very poor/poor/neither bad nor good. [4]good/very good. [5]nothing/very little/more or less. [6]many times/always.

Anexo K - Supplementary Material 5. Univariate analysis for the evaluation of characteristics associated to negative affects measured by Diener and Emmon's Positive and Negative Experience Scale (PNES)

Supplementary Material 5 – Univariate analysis for the evaluation of characteristics associated to negative affects measured by Diener and Emmon's Positive and Negative Experience Scale (PNES) (n=2580).

Variables	Median (P25 – P75)	p-Value
Participants		<0.001
General population	12 (09-16)	
Caregivers of cancer patients	16 (14-19)	
Cancer patients	15 (13-17)	
Age (years)		0.012
18-29	13 (10-16)	
30-39	13 (10-16)	
40-49	13 (10-16)	
50-59	13 (10-16)	
60-69	14 (12-17)	
≥70	14 (12-17)	
Marital Status		0.005
Married or live married	13 (10-16)	
Windowed	14 (12-18)	
Separated or divorced	14 (11-16)	
Single	13 (10-17)	
Educational Level		<0.001
<8 years	16 (13-18)	
8 to 11 years	14 (11-17)	
>11 years	12 (10-16)	
Family income		<0.001
≤3.9 minimum wages	15 (11-18)	
≥4 minimum wages	12 (10-16)	
Has current professional activity		0.004
Yes	13 (10-16)	
No	15 (11-17)	
Region where live		<0.001
Midwest	14 (11-17)	
Northeast	13 (09-16)	
North	14 (11-16)	
Southeast	13 (10-16)	
South	12 (09-16)	
Government aid		<0.001
Yes	14 (11-17)	
No	13 (10-16)	
Retirement due to disability		<0.001
No	13 (10-16)	
Yes	15 (12-17)	
Sickness Funding Program ("Auxílio doença")		<0.001
No	13 (10-16)	
Yes	15 (12-18)	
Family Funding Program ("Bolsa-família")		0.001

No	13 (10-16)	
Yes	15 (13-19)	
It is considered		<0.001
Pessimistic	17 (14-20)	
Neither optimistic nor pessimistic	15 (12-17)	
Optimistic	12 (09-15)	
Current health problem		<0.001
Yes	14 (11-17)	
No	12 (09-15)	
Diagnosis and treatment of current cancer		<0.001
No	13 (10-16)	
Yes	15 (13-17)	
Diagnosis of depression		<0.001
No	13 (10-16)	
Yes	17 (14-20)	
Diagnosis of anxiety		<0.001
No	13 (10-16)	
Yes	15 (12-18)	
Diagnosis of panic disorder		<0.001
No	13 (10-16)	
Yes	17 (12-20)	
Other psychological/psychiatric problem		<0.001
No	13 (10-16)	
Yes	16 (12-19)	
Leisure time		<0.001
Little[1]	14 (11-17)	
Much[2]	11 (08-15)	
Self-assessment of health		<0.001
Bad[3]	15 (13-19)	
Good [4]	12 (10-16)	
Frequency of family gatherings		<0.001
Little [5]	14 (11-17)	
Much[6]	13 (10-16)	
Contact with nature		0.005
Little [5]	13 (10-17)	
Much[6]	13 (10-16)	
Physical activity		<0.001
Don't practice physical activity	14 (11-17)	
1 a 2 times per week	13 (10-16)	
3 or more times per week	12 (09-15)	
Feeling of happiness with the professional activity		<0.001
Little[1]	15 (11-18)	
Much[2]	12 (09-15)	
Satisfaction with financial issues		<0.001
Little[1]	14 (11-17)	
Much[2]	12 (09-15)	
Sickness in a close person (a loved one)		<0.001
Yes	14 (11-17)	
No	13 (10-16)	

Happiness affected by loved one's disease		<0.001
Little[1]	12 (09-16)	
Much[2]	14 (12-17)	

[1]nothing/very little/more or less. [2]fairly/extremely. [3]very poor/poor/neither bad nor good. [4]good/very good. [5]nothing/very little/more or less. [6]many times/always.

Anexo L - Supplementary Material 1. *Study Recruitment Strategy*

Study Recruitment Strategy

Via Facebook

For the application of the instruments of data collection through the social network Facebook, an online program called SurveyMonkey®, acquired legally from the registration on the site (https://pt.surveymonkey.com).

For data collection via Facebook, 3 different methodologies were used. These are described below:

- ✓ **Methodology 1**: The authors used their personal Facebook pages to share the research post.
- ✓ **Methodology 2:** For this methodology municipalities were selected according to the demographic and IDH profile in each Brazilian state. To promote the research, we created Facebook pages specific to the study entitled "Happiness Research" "Happiness Research II" and "Happiness Research III". 100 individuals from each municipality were invited. When identifying one or more of these, the first contact would be through inbox message on the person's page and friend request.
- ✓ **Methodology 3:** Researchers from the North, Northeast, Midwest and South regions were contacted, without links with the researchers of this study, to be the "pole" of dissemination of the research, in order to carry out the same process of methodology 1 with the objective of propagating research and reach populations outside the southeast region and reach a significant number of cities in Brazil.

Via WhatsApp

Some contacts known to researchers residing in different regions of the country were contacted through the WhatsApp application. Explanatory text about the study was sent together with the research link. In addition to being asked to respond to the questionnaire online, they were encouraged to share the study text/link with their WhatsApp contacts.

Data collection in person

Data collection was carried out with caregivers of patients who undergo oncological treatment in the Units of a Cancer Hospital. Recruitment took place in the hospital's institutional housing. Oncology patients were also recruited and data collection was performed in person, being selected for convenience in the outpatient clinics and in the clinical and surgical hospitalization units and Hospital Oncology Palliative Care Unit.

Anexo M - Supplementary Table 1. Examples of participants' responses per category and subcategory**.**

Supplementary Table 1. Examples of participants' responses per category and subcategory.

Categories and Subcategories	**Examples from narratives**
Category 1: Nothing	"I believe nothing is missing for me to be happy, I'm already happy because I believe there is happiness in simple everyday situations, we just need to find it. And that being happy depends on the value we give to difficulties and accomplishments, this is why I say I'm happy, satisfied with my life, amid all difficulties I find the amount of happiness I need." (ID: 1662 - General Population); "Nothing is missing" (ID: 2691 - Cancer Patient); "Anything" (ID: 2994 - Informal Caregiver)
Category 2: I wish for a better health for myself or someone else in order to be happy	"Finishing a medical treatment and having more health" (ID: 1254 - Cancer Patient); "Recovering from a health problem and returning to everyday activities." (ID: 2385 - Cancer Patient); "My own health, my husband's, my mother's" (ID: 2728 - Cancer Patient)
Subcategory 2a: I hope to find in a cure a reason to be happy	"Curing cancer would make me very happy now" (ID: 343 - General Population); "… Getting cured, because although I'm under palliative care and I'm rationally aware there's no cure for me, inside I always hope it might happen." (ID: 671 - Cancer Patient); "Discovering the cure for cancer, for many families not to suffer as my family did!" (ID: 1053 - General Population); "Getting cured from depression and everything related to it" (ID: 1714 - General Population); "Staying healthy, healed" (ID: 2690 - Cancer Patient); "Healing illness, health" (ID: 2716 - Cancer Patient); "Cure of cancer" (ID: 2786 - Cancer Patient); "The cure of the daughter" (ID: 2992 - Informal Caregiver); "The Nephew's cure" (ID: 3101 - Informal Caregiver)
Category 3: Good interpersonal relationships would make me happier	"Family togetherness" (ID: 184 - General Population); "Solve family problems relative to my spouse" (ID: 314 - General Population); "Closer relationships with other family members" (ID: 330 - General Population); "Be able to overcome the ideological barrier between me and my relatives and talk openly with them, always giving my honest opinion." (ID: 414 - General Population)
Subcategory 3a: I'm looking for a romantic relationship to be happier	"Overcome my divorce and find someone" (ID: 103 - General Population); "A true love and home" (ID: 140 - General Population); "A serious and stable relationship" (ID: 277 - General Population); "I'm happy. But if I could choose one more thing, someone to share life with" (ID: 289 - General Population); "Rebuild my love life" (ID: 423 - General Population); "Affective accomplishment, a partner" (ID: 445 - General Population); "A partner who loves me and whom I love" (ID: 470 - General Population); "Finding my soulmate" (ID: 1114 - Cancer Patient); "Meet someone I truly love and who loves me" (ID: 1142 - General Population); "A partner" (ID: 1263 - General Population)

Subcategory 3b: Building a family would make me happier	"Having a relationship and building a family" (ID: 85 - General Population); "Getting married and having a family" (ID: 150 - General Population); "Family, having a partner and children" (ID: 874 - General Population); "Love and children" (ID: 889 - General Population); "Building a family. Marriage!" (ID: 1035 - General Population); "Getting married and being close to my fiancée" (ID: 1277 - General Population); "Remarry" (ID: 1585 - General Population); "Find someone who completes me to grow old together." (ID: 1613 - General Population)
Subcategory 3c: I need to be closer to my family to be happy	"Be closer to distant relatives" (ID: 174 - General Population); "Be closer to my three children, I think we'll be next year. Enjoy my six grandchildren" (DI: 187 - General Population); "Spend more time with my nephews and relatives, distance and distancing" (ID: 189 - General Population); "That my son comes to live with me." (ID: 192 - General Population); "Be closer to my mom and sister" (ID: 393 - General Population)
Subcategory 3d: Friends, I'm missing good friends to be happy	"Friendly people around me, with whom I can share my feelings, fears, joys" (ID: 852 - General Population); "… Have more friends where I live" (ID: 1885 - General Population); "… Have true friends" (ID: 1965 - General Population); "… More loyal friends" (ID: 2098 - General Population); "Have close friends." (ID: 2599 - General Population)
Category 4: "To have" to "be" happier	"Attain a desirable social level, without debts, my own home" (ID: 16 - General Population); "Financial structure, having my own home" (ID: 56 - General Population); "Conditions to buy a good house" (ID: 57 - Cancer Patient); "Better financial conditions to buy a car and better leisure activities (outings, trips, etc.)" (ID: 1046 - General Population); "Have a stable professional life and the desired financial condition." (ID: 2574 - General Population)
Subcategory 4a: Money would make me happier	"Have my own business to have complete financial independence" (ID: 31 - General Population); "Pay my debts" (ID: 181 - General Population); "Money to travel" (ID: 608 - General Population); "Money to help some people, move to another home, have access to places only money affords" (ID: 1288 - General Population); "A comfortable financial situation" (ID: 1525 - - General Population); "Be very wealthy" (ID: 2877 - Cancer Patient); "A better financial condition" (ID: 2889 - Cancer Patient); "Have a good salary." (ID: 3037 - Informal Caregiver); "Improved family income" (ID: 3080 - Informal Caregiver); "… Improve the family income" (ID: 3094 - Informal Caregiver)
Subcategory 4b: I need material things to be happy	"Build my dream house" (ID: 21 - General Population); "My own new home" (ID: 126 - General Population); "I'm happy, but I dream of getting some material things, like my own home" (ID: 139 - General Population); "Have my own home and a car" (ID: 2755 – Cancer Patient); "Build a new house" (ID: 2839 - Cancer Patient); "Buy a car" (ID: 3027 - Informal Caregiver)

Category 5: To be more spiritual	"I need to know myself better" (ID: 11 - General Population); "Find deep meaning in everything" (ID: 48 - General Population); "Emotional, mental and spiritual strength and balance to cope with the natural problems of life" (ID: 91 - General Population); "Peace" (ID: 124 - General Population); "… Have discipline in religious practice" (ID:186 - General Population); "Find inner peace" (ID: 390 - General Population); "More self-knowledge" (ID: 883 - General Population); "Full trust in God, without fear… anxiety… anguish…" (ID: 1221 - General Population); "Be closer to God" (ID: 1332 - General Population); "What's missing for me to be happy is being more connected to the Father's will in my life and, of course, the arrival of the grand day of His second coming to come get us and live eternally happy with Him" (ID: 1417 - General Population); "More spiritual growth" (ID: 2202 - General Population); "More faith" (ID: 2250 - General Population); "More communion with God" (ID: 2465 - General Population); "Search for God" (ID: 2789 – Cancer Patient); "Have more God in life" (ID: 3087 - Informal Caregiver)
Category 6: Do good for others (altruism)	"... Be less selfish and help others more" (ID: 186 - General Population); "Help more people" (ID: 310 - General Population); "Put my gifts into practice, give more" (ID: 326 - General Population); "Work in something that provides care and well-being to people" (ID: 1046 - General Population); "… Help the needy" (ID: 1135 - General Population); "Accomplish my dreams and be in a condition to help the people around me who need me" (ID: 1219 - General Population); "… Rescue more abandoned animals" (ID: 1231 - General Population); "Have the financial condition to help someone very loved and important" (ID: 1543 - General Population); "Have time to do volunteer work." (ID: 2129 - General Population)
Category 7: More leisure activities and rest	"Stop working too much" (ID: 90 - General Population); "More leisure time; I work on weekends and I don't see my family and friends much" (ID: 129 - General Population); "Accomplish my dream of traveling across the world" (ID: 175 - General Population); "… Have more time to go out with my husband and travel" (ID: 286 - General Population); "Work less and spend more time with my family." (ID: 357 - General Population) "… Have more leisure and family time" (ID: 481 - General Population); "Work less, live more" (ID: 578 - General Population); "Have more free time" (ID: 1827 - General Population); "… Travel abroad more" (2337 - General Population)
Category 8: Better professional status	"A job in my field with a decent salary" (ID: 05 - General Population); "I intend to change my profession, find something that will bring me more professional recognition and personal satisfaction" (ID: 39 - General Population); "… A job compatible with my degree of specialization" (ID: 85 - General Population); "Civil servant stability" (ID: 99 - General Population); "Consolidate my new career as a quantum therapist" (ID: 209 - General Population); "Job stability" (ID: 277 - General Population); "Professional success" (ID: 372 - General Population); "Feel more independent and autonomous to do the tasks and work related to my profession" (ID: 379 - General Population); "A job in my field with fair compensation" (ID: 610 - General Population); "A career that will give me a feeling of financial and professional

	accomplishment" (ID: 1092 - General Population); "… Follow the desired path for my career and vocation" (ID: 1419 - General Population); "Be recognized by the government for my profession (teaching)" (ID: 1458 - General Population); "Find myself professionally" (ID: 2522 - General Population)
Subcategory 8a: Accomplish my goals as a student	"To finish graduate school so I can go back to the town where my parents and boyfriend live and start my professional career" (ID: 51 - General Population); "Finish the medical residency program" (ID: 369 - General Population); "Get another college degree" (ID: 637 - General Population); "Get a master's degree in Education" (ID: 1133 - General Population); "Finish college." (ID: 1666 - General Population); "Finish the PhD" (ID: 2495 - General Population)
Category 9: A better Brazil and a better world	"Brazil with better opportunities, better education, a better healthcare network, without corruption, in short, with a better quality of life for the entire population "(ID: 33 - General Population); "That the Brazilian government be a part of it" (ID: 194 - General Population); "A better country with honest people" (ID: 242 - General Population); "A more fair society" (ID: 341 - General Population); "… A more fair world" (ID: 566 - Cancer Patient); "To live in a world without fear of violence, without corruption, without the concern of being cheated all the time" (ID: 695 - General Population); "A better world… without dishonest people, without hunger, inequality, poverty… Perhaps then we might be truly happy." (ID: 716 - General Population); "A country ruled by serious people to give us better living conditions" (ID: 900 - General Population); "A government that cares for our forsaken peoples, including the municipal and state governments, and the federal government, which abandoned us so long ago" (ID: 1608 - General Population)
Subcategory 9a: Social well-being	"... Less social inequality" (ID: 477 - General Population); "A more peaceful society, which appreciates equality/equity, income distribution and solidarity" (ID: 924 - General Population); "See Brazil become less unequal, too much suffering everywhere and due to different reasons" (ID: 1794 - General Population); "Social equity." (ID: 2184 - General Population)
Subcategory 9b: Less corruption	"… To live in a place with respect and without corruption" (ID: 311 - General Population); "Do away with the corrupt politicians in Brazil so there's more money for health care. Improve the quality of education in Brazilian schools" (ID: 511 - General Population); "Remove 'points of unhappiness.' From violence, unconformity with corruption and the current political-economic situation in the country to a financial condition different from the desired one. All these points don't let you sleep or be calm, and don't let us reach fulfillment as concerns happiness" (ID: 814 - General Population); "I'm happy, I'd be happier if corruption was expelled from the world!" (ID: 878 - General Population)
Subcategory 9c: Safety	"World peace" (1334 - General Population); "Safety (there have been too many burglaries in my neighborhood)" (ID: 1445 - General Population); "Feel safer in my town." (ID: 1687 - General Population)

Anexo N – Corpo do convite de participação na pesquisa enviados aos *"friends"* dos pesquisadores via *Facebook* (para acesso ao *link* da pesquisa)

OS BRASILEIROS SÃO FELIZES?

O Grupo de Pesquisas em Cuidados Paliativos e Qualidade de Vida do Hospital de Câncer de Barretos está realizando uma pesquisa séria, com rigor metodológico, para avaliar os índices de felicidade, satisfação com a vida e afetos positivos e negativos da população brasileira.

PARTICIPE E RESPONDA acessando o link: https://pt.surveymonkey.com/s/YX5ZNR6

Nos ajude a divulgar e a compartilhar essa importante pesquisa.

Anexo O – Processo de seleção dos municípios participantes da coleta de dados por meio do *Facebook*

Considerando:

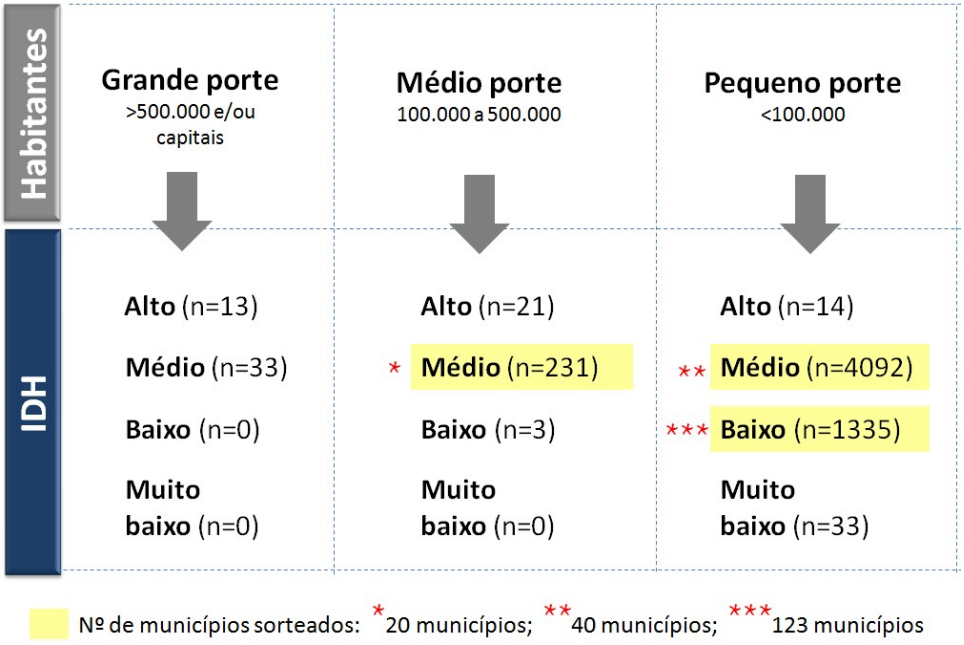
- Os 5.570 municípios brasileiros são classificados segundo o número de habitantes em grande porte (>500.000 habitantes; Grupo A), médio porte (entre 100.000 e 500.000 habitantes; Grupo B) e pequeno porte (<100.000 habitantes; Grupo C) e também segundo o Índice de Desenvolvimento Humano (IDH) em alto (>0,8), médio (0,50 a 0,79) e baixo (<0,5).
- No Brasil, somente 33 municípios possuem IDH muito baixo. Assim, para não haver grandes discrepâncias entre o número de participantes quando considerados o IDH municipal, calcularam-se as medianas do IDH dos municípios brasileiros e seus percentis. A mediana foi 0,665 e o percentil 25 = 0,599. Para esta etapa do estudo, foram classificados como municípios com baixo IDH aqueles classificados entre 0,50 e 0,59 (total de 1335) e municípios com muito baixo IDH aqueles com IDH<0,50 (total de 33).
- As cidades foram classificadas dentro de um dos seguintes grupos: Grupo A (grande porte), Grupo B (médio porte) e Grupo C (pequeno porte). Cada um dos grupos foi subdivido segundo o IDH em alto, médio, baixo e muito baixo.

Considerando os dados oficiais divulgados pelo Instituto Brasileiro de Geografia e Estatística (IBGE), concluiu-se que no Grupo A existem 13 municípios com alto IDH, 33 com médio IDH e nenhum com baixo IDH. Todos os municípios do Grupo A serão incluídos no estudo.

No Grupo B, há 21 municípios com alto IDH, 231 com médio IDH e apenas 3 com baixo IDH. Assim, participarão do estudo todos os municípios com alto e baixo IDHs, sendo sorteados arbitrariamente 20 dos 231 municípios classificados como médio IDH.

No Grupo C, há 14 municípios com alto IDH, 4.092 com médio IDH, 1.335 com baixo IDH e 33 com muito baixo IDH. Participarão do estudo, todos os municípios com IDHs alto e muito baixo. Serão sorteados arbitrariamente 40 municípios com médio IDH e 123 municípios com baixo IDH.

Assim, serão selecionadas todas as 46 cidades do Grupo A (13 com alto IDH e 33 com médio IDH), 44 do Grupo B (20 com alto IDH, 20 com médio IDH e 3 com IDH baixo) e 210 do Grupo C (14 com alto IDH, 40 com IDH médio, 123 com IDH baixo e 33 com IDH muito baixo), conforme exemplificado na **Figura abaixo**.



Esquema simplificado descrevendo o processo de definição do número de municípios que para os quais serão enviados os convites de participação no estudo da população geral.

Anexo P – Detalhes dos municípios selecionados para envio de convites para participação no estudo.

ID	Estado	Cidade	IDH	Classificação IDH	População	Classificação População
1	SP	Santo André	0,815	1	710.210	A
2	SP	Ribeirão Preto	0,800	1	658.059	A
3	RS	Porto Alegre	0,805	1	1.472.482	A
4	SP	São Paulo	0,805	1	11.895.893	A
5	SP	Campinas	0,805	1	1.154.617	A
6	SP	São Bernardo do Campo	0,805	1	811.489	A
7	SP	São José dos Campos	0,807	1	681.036	A
8	SC	Joinville	0,809	1	554.601	A
9	MG	Belo Horizonte	0,810	1	2.491.109	A
10	PR	Curitiba	0,823	1	1.864.416	A
11	DF	Brasília	0,824	1	2.852.372	A
12	ES	Vitória	0,845	1	352.104	A
13	SC	Florianópolis	0,847	1	461.524	A
14	RR	Boa Vista	0,752	2	314.900	A
15	RJ	Duque de Caxias	0,711	2	878.402	A
16	BA	Feira de Santana	0,712	2	612.000	A
17	RJ	Nova Iguaçu	0,713	2	806.177	A
18	PE	Jaboatão dos Guararapes	0,717	2	680.943	A
19	GO	Aparecida de Goiânia	0,718	2	511.323	A
20	AL	Maceió	0,721	2	1.005.319	A
21	AC	Rio Branco	0,727	2	363.928	A
22	AP	Macapá	0,733	2	446.757	A
23	RO	Porto Velho	0,736	2	494.013	A
24	AM	Manaus	0,737	2	2.020.301	A
25	RJ	São Gonçalo	0,739	2	1.031.903	A
26	PA	Belém	0,746	2	1.432.844	A
27	PI	Teresina	0,751	2	840.600	A
28	CE	Fortaleza	0,754	2	2.571.896	A
29	MG	Contagem	0,756	2	643.476	A
30	BA	Salvador	0,759	2	2.902.927	A
31	RN	Natal	0,763	2	862.044	A
32	PB	João Pessoa	0,763	2	780.738	A
33	SP	Guarulhos	0,763	2	1.312.197	A
34	MA	São Luís	0,768	2	1.064.197	A
35	SE	Aracaju	0,770	2	623.766	A
36	PE	Recife	0,772	2	1.608.488	A
37	SP	Osasco	0,776	2	693.271	A
38	PR	Londrina	0,778	2	543.003	A
39	MG	Juiz de Fora	0,778	2	550.710	A
40	MS	Campo Grande	0,784	2	843.120	A
41	MT	Cuiabá	0,785	2	575.480	A

42	TO	Palmas	0,788	2	265.409	A
43	MG	Uberlândia	0,789	2	654.681	A
44	SP	Sorocaba	0,798	2	637.187	A
45	GO	Goiânia	0,799	2	1.412.364	A
46	RJ	Rio de Janeiro	0,799	2	6.453.682	A
47	SC	Balneário Camboriú	0,845	1	124.557	B
48	SC	São José	0,809	1	228.561	B
49	PR	Maringá	0,808	1	391.698	B
50	SC	Blumenau	0,806	1	334.002	B
51	SC	Jaraguá do Sul	0,803	1	160.143	B
52	SP	São Caetano do Sul	0,862	1	157.205	B
53	SP	Santos	0,84	1	433.565	B
54	RJ	Niterói	0,837	1	495.470	B
55	SP	Jundiaí	0,822	1	397.965	B
56	SP	Valinhos	0,819	1	118.312	B
57	SP	Araraquara	0,815	1	224.304	B
58	SP	Santana de Parnaíba	0,814	1	123.825	B
59	SP	Americana	0,811	1	226.970	B
60	SP	Presidente Prudente	0,806	1	220.599	B
61	SP	Assis	0,805	1	100.911	B
62	SP	São Carlos	0,805	1	238.958	B
63	SP	Bauru	0,801	1	364.562	B
64	SP	Botucatu	0,800	1	137.899	B
65	ES	Vila Velha	0,800	1	465.690	B
66	SP	Taubaté	0,800	1	299.423	B
67	PA	Marituba	0,676	2	120.305	B
68	PA	Barcarena	0,662	2	112.921	B
69	AM	Parintins	0,658	2	110.411	B
70	PA	Bragança	0,600	2	120.124	B
71	SC	Chapecó	0,790	2	202.009	B
72	RS	Canoas	0,750	2	339.979	B
73	PR	Arapongas	0,748	2	113.833	B
74	BA	Barreiras	0,721	2	152.208	B
75	BA	Santo Antônio de Jesus	0,700	2	100.550	B
76	BA	Vitória da Conquista	0,678	2	340.199	B
77	BA	Eunápolis	0,677	2	112.032	B
78	MS	Corumbá	0,700	2	108.010	B
79	MG	Barbacena	0,769	2	133.972	B
80	SP	Suzano	0,765	2	282.441	B
81	SP	Atibaia	0,765	2	135.895	B
82	MG	Divinópolis	0,764	2	228.643	B
83	SP	Jandira	0,760	2	117.457	B
84	SP	Hortolândia	0,756	2	212.527	B
85	SP	Praia Grande	0,754	2	293.695	B
86	ES	Colatina	0,746	2	121.670	B
87	ES	São Mateus	0,735	2	122.668	B

88	PA	São Félix do Xingu	0,594	3	111.633	B
89	PA	Cametá	0,577	3	129.161	B
90	MA	Codó	0,595	3	119.962	B
91	SC	Joaçaba	0,827	1	28.705	C
92	SC	Rio Fortuna	0,806	1	4.569	C
93	SC	Rio do Sul	0,802	1	66.251	C
94	SC	São Miguel do Oeste	0,801	1	38.575	C
95	SC	Concórdia	0,800	1	72.073	C
96	SP	Águas de São Pedro	0,854	1	3.073	C
97	SP	Vinhedo	0,817	1	71.217	C
98	MG	Nova Lima	0,813	1	88.672	C
99	SP	Ilha Solteira	0,812	1	26.242	C
100	SP	Rio Claro	0,803	1	17.768	C
101	SP	Pirassununga	0,801	1	74.128	C
102	AC	Brasiléia	0,614	2	23.378	C
103	SC	Nova Erechim	0,765	2	4.654	C
104	PR	Cafelândia	0,748	2	17.424	C
105	PR	Bom Sucesso do Sul	0,742	2	3.368	C
106	SC	Caibi	0,728	2	6.259	C
107	PR	Formosa do Oeste	0,723	2	7.381	C
108	RS	São José do Herval	0,717	2	2.201	C
109	PR	Santa Fé	0,705	2	11.297	C
110	SC	Araquari	0,703	2	31.030	C
111	RS	Boa Vista do Cadeado	0,703	2	25.22	C
112	PR	Campo Magro	0,701	2	27.143	C
113	PR	Rio Branco do Sul	0,679	2	32.092	C
114	RS	Coronel Bicaco	0,665	2	7.855	C
115	PR	São João do Caiuá	0,664	2	6.044	C
116	PR	Imbituva	0,66	2	30.713	C
117	RN	Parelhas	0,676	2	21.387	C
118	PI	Inhuma	0,624	2	15.032	C
119	CE	Fortim	0,624	2	15.781	C
120	SE	Cedro de São João	0,623	2	5.868	C
121	BA	Ibipeba	0,616	2	18.540	C
122	MA	Igarapé Grande	0,614	2	11.533	C
123	SE	Amparo de São Francisco	0,611	2	2.366	C
124	RN	Monte Alegre	0,609	2	56.231	C
125	PE	Lagoa do Carro	0,609	2	17.247	C
126	PE	Tracunhaém	0,605	2	13.547	C
127	BA	Santa Rita de Cássia	0,605	2	28.642	C
128	GO	Rio Quente	0,731	2	3.828	C
129	GO	Paranaiguara	0,711	2	9.678	C
130	GO	Pirenópolis	0,693	2	24.279	C
131	SP	Bálsamo	0,756	2	8.703	C
132	SP	Nhandeara	0,751	2	11.254	C
133	MG	Andradas	0,734	2	39.761	C

134	SP	Pontes Gestal	0,732	2	2.593	C
135	SP	Chavantes	0,729	2	12.482	C
136	SP	Ubirajara	0,727	2	4.662	C
137	MG	Pará de Minas	0,725	2	90.306	C
138	MG	Passa Quatro	0,715	2	16.290	C
139	MG	Juramento	0,669	2	4.307	C
140	MG	Desterro de Entre Rios	0,639	2	7.279	C
141	MG	Itambacuri	0,634	2	23.557	C
142	MG	Cônego Marinho	0,621	2	7.515	C
143	MG	Felício dos Santos	0,606	2	5.118	C
144	PR	Palmas	0,660	2	42.888	C
145	AM	Manaquiri	0,596	3	27.480	C
146	PA	Igarapé-Açu	0,595	3	37.112	C
147	TO	Carrasco Bonito	0,594	3	3.945	C
148	AP	Mazagão	0,592	3	19.157	C
149	PA	Uruará	0,589	3	44.607	C
150	RO	Nova Mamoré	0,587	3	26.925	C
151	AM	Coari	0,586	3	82.209	C
152	TO	Dois Irmãos do Tocantins	0,583	3	7.311	C
153	RR	Iracema	0,582	3	10.043	C
154	AM	São Sebastião do Uatumã	0,577	3	12.451	C
155	AM	Caapiranga	0,569	3	12.214	C
156	PA	Alenquer	0,564	3	54.353	C
157	AM	Novo Aripuanã	0,554	3	23.905	C
158	AM	Carauari	0,549	3	27.645	C
159	PA	Capitão Poço	0,548	3	52.616	C
160	PA	Muaná	0,547	3	37.314	C
161	PA	São João de Pirabas	0,539	3	21.767	C
162	AM	Canutama	0,53	3	14.944	C
163	AM	Fonte Boa	0,53	3	21.295	C
164	AM	Alvarães	0,527	3	15.357	C
165	AM	Uarini	0,527	3	12.963	C
166	PA	Garrafão do Norte	0,526	3	25.307	C
167	AM	São Paulo de Olivença	0,521	3	35.757	C
168	PA	Senador José Porfírio	0,514	3	12.075	C
169	AM	Envira	0,509	3	18.422	C
170	AL	Maribondo	0,597	3	13.719	C
171	CE	Hidrolândia	0,597	3	19.970	C
172	MA	Vitória do Mearim	0,596	3	31.923	C
173	PI	São Braz do Piauí	0,596	3	4.367	C
174	RN	São Bento do Trairí	0,595	3	4.262	C
175	AL	Pão de Açúcar	0,593	3	24.924	C
176	RN	Viçosa	0,592	3	1.705	C
177	MA	São Vicente Ferrer	0,592	3	21.591	C
178	BA	Antas	0,592	3	18.970	C
179	RN	Brejinho	0,592	3	12.399	C

180	BA	Ibicoara	0,591	3	19.309	C
181	AL	São Miguel dos Milagres	0,591	3	7.795	C
182	RN	Santana do Matos	0,591	3	13.517	C
183	BA	Serrolândia	0,590	3	13.308	C
184	PB	Pedras de Fogo	0,590	3	28.174	C
185	BA	Anguera	0,589	3	11.209	C
186	MA	Lajeado Novo	0,589	3	7.287	C
187	BA	Feira da Mata	0,588	3	5.911	C
188	PE	Afrânio	0,588	3	18.831	C
189	BA	Palmas de Monte Alto	0,586	3	22.340	C
190	PB	Tavares	0,586	3	14.518	C
191	AL	Porto Calvo	0,586	3	27.171	C
192	PB	Mamanguape	0,585	3	44.030	C
193	BA	Ibipitanga	0,584	3	15.231	C
194	AL	Matriz de Camaragibe	0,584	3	25.006	C
195	BA	Itanagra	0,584	3	8.029	C
196	BA	Tabocas do Brejo Velho	0,584	3	13.008	C
197	PE	Vertentes	0,582	3	19.720	C
198	BA	Catolândia	0,582	3	3.644	C
199	BA	Condeúba	0,582	3	18.312	C
200	BA	Mascote	0,581	3	15.131	C
201	PB	São José do Brejo do Cruz	0,581	3	1.767	C
202	MA	Vila Nova dos Martírios	0,581	3	12.661	C
203	SE	Indiaroba	0,580	3	17.165	C
204	AL	Limoeiro de Anadia	0,580	3	28.439	C
205	PB	Desterro	0,580	3	8.225	C
206	SE	Umbaúba	0,579	3	24.251	C
207	BA	Terra Nova	0,578	3	13.537	C
208	PB	São José do Bonfim	0,578	3	3.452	C
209	PB	Taperoá	0,578	3	15.284	C
210	PE	Belém de Maria	0,578	3	11.833	C
211	PB	São José de Espinharas	0,577	3	4.711	C
212	BA	Vereda	0,577	3	6.737	C
213	PE	João Alfredo	0,576	3	32.651	C
214	BA	Ibirataia	0,576	3	18.348	C
215	PI	Bela Vista do Piauí	0,576	3	3.902	C
216	BA	Jitaúna	0,575	3	13.636	C
217	BA	Barra da Estiva	0,575	3	22.566	C
218	BA	Iaçu	0,574	3	26.382	C
219	PB	Mogeiro	0,574	3	13.333	C
220	RN	Touros	0,572	3	33.228	C
221	RN	Sítio Novo	0,572	3	17.559	C
222	PB	Cuitegi	0,570	3	6.867	C
223	AL	Japaratinga	0,570	3	8.294	C
224	PE	Pedra	0,567	3	21.609	C
225	AL	Igaci	0,564	3	26.060	C

226	PB	Lagoa	0,563	3	4.698	C
227	BA	Almadina	0,563	3	6.234	C
228	BA	Itaguaçu da Bahia	0,562	3	14.533	C
229	PB	Fagundes	0,560	3	11.413	C
230	PB	Pilões	0,560	3	3.723	C
231	MA	Bom Jesus das Selvas	0,558	3	32.133	C
232	BA	Floresta Azul	0,557	3	11.352	C
233	PB	Riachão do Poço	0,555	3	4.401	C
234	MA	Penalva	0,554	3	36.899	C
235	PI	São Luis do Piauí	0,554	3	2.593	C
236	MA	Cajapió	0,553	3	10.876	C
237	PB	Tacima	0,551	3	10.745	C
238	PE	Lagoa dos Gatos	0,551	3	16.131	C
239	BA	Barra do Choça	0,551	3	35.200	C
240	PI	Lagoa Alegre	0,55	3	8.290	C
241	AL	Água Branca	0,549	3	20.601	C
242	RN	Parazinho	0,549	3	5.127	C
243	PB	São Miguel de Taipu	0,548	3	7.026	C
244	PI	Cajueiro da Praia	0,546	3	7.415	C
245	MA	Monção	0,546	3	32.516	C
246	BA	Adustina	0,546	3	17.044	C
247	PB	Dona Inês	0,545	3	10.495	C
248	PI	Wall Ferraz	0,544	3	4.365	C
249	PI	Riacho Frio	0,541	3	4.255	C
250	BA	Jucuruçu	0,541	3	10.272	C
251	PE	Paranatama	0,537	3	11.449	C
252	MA	Matões do Norte	0,533	3	15.758	C
253	AL	Cacimbinhas	0,531	3	10.775	C
254	MA	São Francisco do Maranhão	0,528	3	11.961	C
255	BA	Sátiro Dias	0,527	3	20.259	C
256	AL	Carneiros	0,526	3	8.867	C
257	MA	Santa Filomena do Maranhão	0,525	3	7.503	C
258	PI	Aroeiras do Itaim	0,519	3	2.460	C
259	AL	Santana do Mundaú	0,519	3	11.070	C
260	MA	Santo Amaro do Maranhão	0,518	3	15.110	C
261	PI	Queimada Nova	0,515	3	8.775	C
262	PI	Brejo do Piauí	0,515	3	3.714	C
263	MA	Aldeias Altas	0,513	3	25.509	C
264	AL	Branquinha	0,513	3	10.783	C
265	GO	Cavalcante	0,584	3	9.747	C
266	MG	Crisólita	0,585	3	6.467	C
267	MG	Cipotânea	0,579	3	6.813	C
268	MG	Orizânia	0,562	3	7.767	C
269	AM	Maraã	0,498	4	18.367	C
270	AM	Pauini	0,496	4	19.265	C
271	AM	Santo Antônio do Içá	0,490	4	24.005	C

272	PA	Afuá	0,489	4	37.004	C
273	PA	Ipixuna do Pará	0,489	4	56.613	C
274	PA	Anajás	0,484	4	27.051	C
275	RR	Amajari	0,484	4	10.721	C
276	PA	Portel	0,483	4	57.205	C
277	AM	Ipixuna	0,481	4	26.118	C
278	AM	Santa Isabel do Rio Negro	0,479	4	21.702	C
279	AM	Itamarati	0,477	4	8.205	C
280	PA	Cachoeira do Piriá	0,473	4	30.430	C
281	PA	Bagre	0,471	4	27.491	C
282	AC	Jordão	0,469	4	7.330	C
283	RR	Uiramutã	0,453	4	9.309	C
284	PA	Chaves	0,453	4	22.302	C
285	AM	Atalaia do Norte	0,450	4	17.658	C
286	PA	Melgaço	0,418	4	26.133	C
287	PI	Assunção do Piauí	0,499	4	7.667	C
288	PI	Cocal dos Alves	0,498	4	6.014	C
289	PI	Cocal	0,497	4	27.163	C
290	AL	Olivença	0,493	4	11.643	C
291	MA	Satubinha	0,493	4	13.231	C
292	MA	Jenipapo dos Vieiras	0,490	4	16.015	C
293	PI	Betânia do Piauí	0,489	4	6.092	C
294	PI	Caxingó	0,488	4	5.248	C
295	PE	Manari	0,487	4	19.910	C
296	BA	Itapicuru	0,486	4	35.632	C
297	PI	São Francisco de Assis do Piauí	0,485	4	5.759	C
298	AL	Inhapi	0,484	4	18.535	C
299	MA	Marajá do Sena	0,452	4	7.689	C
300	MA	Fernando Falcão	0,443	4	9.932	C

Anexo Q - Corpo do convite de participação na pesquisa enviados via *Facebook* aos possíveis participantes dos municípios selecionados (para acesso ao *link* da pesquisa)

Sou pesquisador do Hospital de Câncer de Barretos (interior de São Paulo) e desenvolvo junto ao grupo de pesquisas de Qualidade de Vida um estudo sobre a Felicidade da população Brasileira. Ficaria grato se pudesse responder e compartilhar o link entre seus amigos do *Facebook*!

OS BRASILEIROS SÃO FELIZES?

O Grupo de Pesquisas em Cuidados Paliativos e Qualidade de Vida do Hospital de Câncer de Barretos está realizando uma pesquisa séria, com rigor metodológico, para avaliar os índices de felicidade, satisfação com a vida e afetos positivos e negativos da população brasileira.

PARTICIPE E RESPONDA acessando o link: https://pt.surveymonkey.com/s/YX5ZNR6

Nos ajude a divulgar e a compartilhar essa importante pesquisa.

Anexo R - Corpo do convite de participação na pesquisa enviados via *WhatsApp* aos possíveis participantes dos municípios selecionados (para acesso ao *link* da pesquisa)

Que tal pensar sobre você e sobre sua vida? VOCÊ REALMENTE É FELIZ?

Responda à pesquisa sobre FELICIDADE do Hospital de Câncer de Barretos!PARTICIPE acessando o *link*: https://pt.surveymonkey.com/s/YX5ZNR6

Anexo S – Termo de Consentimento Livre e Esclarecido para coleta de dados presencial

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO (TCLE)
PARA PARTICIPAÇÃO EM PESQUISA

TÍTULO DO ESTUDO:
Avaliação dos índices de felicidade, satisfação com a vida e afetos positivos e negativos em pacientes com câncer e pessoas da população geral: estudo transversal utilizando ferramenta *on-line*.

PESQUISADORES:
Hospital de Câncer de Barretos, Brasil
Carlos Eduardo Paiva, Mayara Goulart de Camargos, Bianca Sakamoto Ribeiro Paiva

O QUE É ESTE DOCUMENTO?
Você está sendo convidado(a) a participar deste estudo que será realizado pelo Grupo de Pesquisas em Qualidade de Vida do Hospital de Câncer de Barretos - Fundação Pio XII. Este documento é chamado de "Termo de Consentimento Livre e Esclarecido" e explica este estudo e qual será a sua participação, caso você aceite o convite. Este documento também fala os possíveis riscos e benefícios se você quiser participar, além de dizer os seus direitos como participante de pesquisa. Após analisar as informações deste Termo de Consentimento e esclarecer todas as suas dúvidas, você terá o conhecimento necessário para tomar uma decisão sobre sua participação ou não neste estudo. Não tenha pressa para decidir. Se for preciso, leve para a casa e leia este documento com os seus familiares ou outras pessoas que são de sua confiança.

POR QUE ESTE ESTUDO ESTÁ SENDO FEITO?
O número de pesquisas interessadas em descobrir o que é felicidade e o quanto as pessoas são felizes vêm crescendo ao longo dos anos. Uma das afirmações de maior consenso é de que o ser humano está sempre em busca da felicidade, independente do modo como ele a entenda. A medição da felicidade poderá acrescentar mais informações aos pesquisadores, permitindo um melhor conhecimento das pessoas brasileiras em um contexto holístico do ser humano (conhecimento completo do ser humano enquanto pessoa). A felicidade, da maneira como este estudo pretende avaliar, ainda não foi avaliada na população brasileira. Assim, este estudo se justifica pela ausência de informações relacionadas a este importante construto da qualidade de vida: a sensação de felicidade.

O QUE ESTE ESTUDO QUER SABER?
Este estudo espera definir o percentual de brasileiros adultos, das cinco regiões do Brasil (Norte, Sul, Sudeste, Nordeste e Centro-Oeste), que se consideram felizes e ainda, definir qual é o perfil do brasileiro feliz. Pretende-se também comparar os níveis de felicidade, satisfação com a vida e afetos positivos (como divertido, otimista, alegre, feliz) e afetos negativos (triste, frustrado, deprimido, etc) entre pessoas de diferentes regiões e níveis de desenvolvimento humano. Aproximadamente 2.200 participantes irão responder a esta pesquisa através de uma programa chamado *SurveyMonkey*® (tipo de programa disponível na internet que envia questionários de forma *on-line*), sendo que a pesquisa também está sendo divulgada através da rede social *Facebook* e do aplicativo *WhatsApp* . Além da coleta de dados on-line, estamos convidando pessoas como você, que sejam acompanhando pacientes que realizam tratamento no Hospital de Câncer de Barretos, para também participar do estudo. Nosso objetivo é o de recrutar participantes que morem em estados fora da região sudeste, visto que o número de participantes da região

sudeste (estados de São Paulo, Minas Gerais, Espírito Santo e Rio de Janeiro) já será o suficiente considerando apenas as respostas *on-line*. No total, 126 participantes com você responderão os questionários de forma presencial (aplicados pelo entrevistador ou com o auxílio do entrevistador, se necessário).

O QUE ACONTECERÁ COMIGO DURANTE O ESTUDO?
Caso aceite participar deste estudo, você responderá a três questionários, contendo no total 36 questões sobre seu bem-estar, sua felicidade, sua satisfação com a vida e afetos positivos e negativos, e um com 32 questões sobre dados sóciodemográficos e clínicos e associados potencialmente à sua felicidade. Acreditamos que você irá demorar aproximadamente 25 minutos para responder os questionários.

HAVERÁ ALGUM RISCO OU DESCONFORTO SE EU PARTICIPAR DO ESTUDO?
Os riscos associados a este estudo são mínimos. É possível que alguma pergunta o faça se sentir triste ou desanimado, por fazer referência a alguma situação desgastante emocionalmente. No entanto, este risco, que é mínimo, pode ser considerado semelhante ao risco de ficar triste ou desanimado com conversas habituais (do dia a dia) com outras pessoas de sua convivência. Existe um risco mínimo de que outras pessoas, não relacionadas ao estudo, tenham acesso às suas informações (quebra da confidencialidade). No entanto, os pesquisadores se comprometem a resguardar seu anonimato. Apenas as pessoas envolvidas no estudo poderão avaliar suas informações que deverão ser identificadas apenas por um código específico do estudo.

HAVERÁ ALGUM BENEFÍCIO PARA MIM SE EU PARTICIPAR DO ESTUDO?
É possível que este estudo não traga benefícios diretos a você. Mas ao final deste estudo, as informações que ele gerar poderão trazer benefícios a outras pessoas.

QUAIS SÃO AS OUTRAS OPÇÕES SE EU NÃO PARTICIPAR DO ESTUDO?
A sua participação neste estudo é voluntária e não é obrigatória. Você pode aceitar participar do estudo e depois desistir a qualquer momento. Você também poderá pedir a qualquer momento que as suas informações sejam excluídas completamente deste estudo e que elas não sejam usadas para mais nada. Você tem o direito de não a responder as perguntas que ocasionem constrangimentos de alguma natureza.

QUAIS SÃO OS MEUS DIREITOS SE EU QUISER PARTICIPAR DO ESTUDO?
Você tem direito a:

1) Receber as informações do estudo de forma clara (utilizando o contato do pesquisador principal por e-mail);
2) Ter oportunidade de esclarecer todas as suas dúvidas (utilizando o contato do pesquisador principal por e-mail);
3) Ter o tempo que for necessário para decidir se quer ou não participar do estudo;
4) Ter liberdade para recusar a participação no estudo, e isto não trará qualquer de problema para você;
5) Ter liberdade para desistir e se retirar do estudo a qualquer momento;
6) Ter direito a reclamar indenização se ocorrer algum dano por causa do estudo;
7) Ter respeitado o seu anonimato (confidencialidade);
8) Ter respeitada a sua vida privada (privacidade);
9) Ter liberdade para não responder perguntas que incomodem você.

SE EU TIVER DÚVIDAS SOBRE OS MEUS DIREITOS OU QUISER FAZER UMA RECLAMAÇÃO, COM QUEM EU FALO?

Fale diretamente com o Comitê de Ética em Pesquisa do Hospital de Câncer de Barretos. Este comitê é formado por pessoas que analisam a parte ética dos estudos e autorizam ele acontecer ou não. Você pode entrar em contato com este Comitê por telefone (tel: (17) 3321-0347 ou (17) 3321-6600 - ramal 6647), email (cep@hcancerbarretos.com.br) carta (Rua Antenor Duarte Vilela, 1331, Instituto de Ensino e Pesquisa, 14784-057) ou pessoalmente. O horário de atendimento é de 2ª a 5ª feira, das 8h00 às 17h00, e 6ª feira, da 8h00 às 16h00. O horário de almoço é de 12h00 às 13h00.

SE EU TIVER DÚVIDAS SOBRE O ESTUDO, COM QUEM EU FALO?
Fale diretamente com o pesquisador responsável. As formas de contato estão abaixo:
Nome do pesquisador: Carlos Eduardo Paiva
Formas de contato: Telefone: +55-17-3321-6600 Ramal: 7075; *E-mail*: drcarlosnap@gmail.com

DECLARAÇÃO DE CONSENTIMENTO
Eu entendi o estudo. Tive a oportunidade de ler o Termo de Consentimento ou alguém leu para mim. Tive o tempo necessário para pensar, fazer perguntas e falar a respeito do estudo com outras pessoas. Autorizo a minha participação na pesquisa. Ao assinar este Termo de Consentimento, não abro mão de nenhum dos meus direitos. Este documento será assinado por mim e pelo pesquisador, sendo todas as páginas rubricadas por nós dois. Uma via ficará comigo, e outra com o pesquisador.

CAMPO DE ASSINATURAS

Nome por extenso do participante de pesquisa ou do representante legal	Data	Assinatura
Nome por extenso do pesquisador	Data	Assinatura
Nome por extenso da testemunha imparcial (para casos de analfabetos, semi-analfabetos ou portadores de deficiência visual)	Data	Assinatura

Anexo T – Protocolo de caracterização sócio demográfica, clínica e questões potencialmente associadas à sensação de felicidade

Avaliação dos índices de felicidade, satisfação com a vida e afetos positivos e negativos em pessoas da população brasileira: estudo transversal			
Carlos Eduardo Paiva/Mayara Goulart de Camargos/Bianca Sakamoto Ribeiro Paiva			
Dados preenchidos pelo pesquisador			
1	ID estudo	**1**	
2	Iniciais	**2**	
3	Data de coleta de dados **DD/MM/AAAA**	**3**	
4	Gênero: **1**- Feminino **2**- Masculino	**4**	
5	Qual cor você se considera? **1-** Branca **2**- Negra **3**- Parda **4**- Amarela **5**- Outra_____	**5**	
6	Qual é a sua idade (em anos)? **1-** <18 **2-** 18-29 **3-** 30-39 **4-** 40-49 **5-** 50-59 **6-** 60-69 **7-** 70-79 **8-** ≥80	**6**	
7	Qual é seu estado civil atual? **1-** Casado(a) ou vive como casado(a) **2-** Viúvo(a) **3-** Separado(a) ou divorciado(a) **4-** Solteiro(a) **5-** Não sei responder **6-** Outro _____	**7**	
8	Qual o seu nível educacional (até quando você estudou)? **1-** Nunca estudei **2-** Nunca estudei, mas sei ler e escrever **3-** Parei de estudar antes da quarta série **4-** Completei a quarta série **5-** Parei de estudar antes da oitava série **6-** Completei a oitava série **7-** Parei de estudar antes do terceiro ano **8-** Completei o terceiro ano **9-** Comecei, mas não terminei uma faculdade **10-** Terminei a faculdade **11-** Fiz Pós-Graduação **12-** Outro_____	**8**	
9	Qual sua atividade profissional ATUAL (se necessário marque mais de uma opção): **1-** Administrador **2-** Agrônomo, veterinário **3-** Aposentado **4-** Arquiteto **5-** Contador **6-** Desempregado **7-** Empresário **8-** Engenheiro **9-** Estudante **10-** Funcionário de atividades administrativas **11-** Funcionário Público **12-** Músico **13-** Professor **14-** Profissional de saúde (médico, enfermeiro, dentista, fisioterapeuta, farmacêutico, psicólogo, nutricionista, etc) **15-** Profissional Liberal **16-** Trabalhador de construção civil **17-** Trabalhador rural **18-** Outra(s) atividades(s)_____	**9**	
10	Você se sente feliz com a sua atividade profissional? **1**- Nada **2**- Muito pouco **3**- Mais ou menos **4**- Bastante **5**- Extremamente	**10**	
11	Qual a cidade em que você mora? Descrever_____	**11**	
12	Qual o estado em que você mora? **1-** Acre (AC) **2-** Alagoas (AL) **3-** Amapá (AP) **4-** Amazonas (AM) **5-** Bahia (BA) **6-**Ceará (CE) **7-** Distrito Federal (DF) **8-** Espírito Santo (ES) **9-** Goiás (GO) **10-** Maranhão (MA) **11-** Mato Grosso (MT) **12-** Mato Grosso do Sul (MS) **13-** Minas Gerais (MG) **14-** Pará (PA) **15-** Paraíba (PB) **16-** Paraná (PR) **17-** Pernambuco (PE) **18-** Piauí (PI) **19-** Rio de Janeiro (RJ) **20-** Rio Grande do Norte (RN) **21-** Rio Grande do Sul (RS) **22-** Rondônia (RO) **23-** Roraima (RR) **24-** Santa Catarina (SC) **25-** São Paulo (SP) **26-** Sergipe (SE) **27-** Tocantins (TO)	**12**	
13	O local onde mora é considerada zona urbana ou rural? **1**- Urbana **2**- Rural	**13**	

14	O local onde mora é considerada comunidade ou favela? **1-** Sim **2-** Não	**14**	
15	Qual a renda total da sua casa (incluindo algum tipo de auxílio do governo)? **1-** Menos de R$788,00 **2-** De R$789,00 a R$1575,00 **3-** De R$1576,00 a R$2363,00 **4-** De R$2364,00 a R$3939,00 **5-** De R$3940,00 a R$7879,00 **6-** De R$7880,00 a R$15.759,00 **7-** Mais de R$15.760,00	**15**	
16	Você recebe algum tipo de auxílio ou bolsa do governo? (você pode marcar mais de uma resposta) **0**- Não recebo nenhum **1**- PROUNI **2**- FIES **3**- Bolsa-Cidadão **4**- Bolsa-Trabalho **5**- Bolsa Alimentação **6**- Bolsa-Escola **7**- Bolsa-Família **8**- Bolsa-Olímpica **9**- Bolsa-Copa **10**- Bolsa-permanência **11**- Bolsa Ditadura **12**- Auxílio Deslocamento para gestantes **13**- Aposentadoria por tempo de contribuição **14**- Aposentadoria por idade **15**- Aposentadoria por invalidez **16**- Auxílio doença **17**- Salário maternidade **18**- Auxílio-reclusão **19**- Pensão por morte **20**- Outro	**16**	
17	Até que ponto você se sente satisfeito com o que já conseguiu financeiramente na sua vida até hoje? **1-** Nada satisfeito **2-** Muito pouco satisfeito **3-** Mais ou menos satisfeito **4-** Muito satisfeito **5-** Extremamente satisfeito	**17**	
18	Com que frequência você e sua família se encontram para reunião familiar em casa (por exemplo, almoço e jantar em família)? **2-** Não tenho familia **1-** Nunca **2-** Raramente **3-** Às vezes **4-** Muitas vezes **5-** Sempre	**18**	
19	Você possui alguma religião? **0-** Não tenho **1-** Católica **2-** Evangélica **3-** Espírita **4-** Outra_____	**19**	
20	Até que ponto sua vida religiosa ou espiritual tem influência na sua felicidade? **1**- Nada **2**- Muito pouco **3**- Mais ou menos **4**- Bastante **5**- Extremamente	**20**	
21	Você tem realizado alguma das atividades abaixo? **1-** Trabalho voluntário para ajudar pessoas ou instituições **2-** Doação financeira para ajudar pessoas ou instituições **3-** Não tenho realizado nenhuma dessas atividades	**21**	
22	Você tem animal(is) de estimação (pode marcar mais de uma resposta se necessário)? **1-** Não tenho **2-** Sim, gato **3-** Sim, cachorro **4-** Sim, pássaros **5-** Sim, coelho **6-** Sim, tartaruga **7-** Sim, hámster/coelhinho da índia/ratazana **8-** Sim, peixe **9-** Sim, outro (especifique)_____	**22**	
23	Com que frequência você tem a oportunidade de ficar parte do seu dia em meio à natureza (caminhada em parques, áreas rurais, passeios a cachoeiras, trilhas em matas, etc) **1**- Nunca **2**- Raramente **3**- Algumas vezes **4-** Muitas vezes **5-** Constantemente	**23**	
24	Você se considera uma pessoa: **1**- Pessimista **2**- Nem otimista e nem pessimista **3**- Otimista	**24**	
25	Considerando as pessoas de quem você gosta (amigos próximos e familiares), alguém atualmente está doente? **1-**Sim **2-** Não	**25**	

26	O quanto a sua felicidade tem sido afetada pela doença da pessoa de quem você gosta (amigo próximo ou familiar)? **1-** Nada **2-** Muito pouco **3-** Mais ou menos **4-** Bastante **5-** Extremamente **99-** Não se aplica	**26**	
27	Com que frequência você tem realizado algum tipo de atividade física (caminhada, bicicleta, futebol, natação, algum tipo de luta, etc)? **0**- Não realizo atividade física **1**- 1 vez por semana **2-** 2 vezes por semana **3**-3 vezes por semana **4-** 4 vezes por semana **5-** 5 vezes por semana **6-** 6 vezes por semana **7-** 7 vezes por semana	**27**	
28	Até que ponto você tem tido momentos de lazer (sair para passear, momento para descanso, conversas, viagens, teatro, cinema, etc)? **3-** Nada **2-** Muito pouco **3-** Mais ou menos **4-** Bastante **5-** Extremamente	**28**	
No momento, o que tem te deixado FELIZ?			
29	Assistir futebol **1**- Sim **2-** Não	**29**	
30	Assistir TV, seriados ou filmes **1**- Sim **2-** Não	**30**	
31	Comer **1**- Sim **2-** Não	**31**	
32	Cozinhar **1**- Sim **2-** Não	**32**	
33	Dançar **1**- Sim **2-** Não	**33**	
34	Descansar em casa **1**- Sim **2-** Não	**34**	
35	Dormir **1**- Sim **2-** Não	**35**	
36	Estar com a família **1**- Sim **2-** Não	**36**	
37	Estar com alta auto-estima **1**- Sim **2-** Não	**37**	
38	Estar com amigos **1**- Sim **2-** Não	**38**	
39	Estar saudável **1**- Sim **2-** Não	**39**	
40	Estudar **1**- Sim **2-** Não	**40**	
41	Familiares/amigos estarem saudáveis **1**- Sim **2-** Não	**41**	
42	Fazer artesanatos **1**- Sim **2-** Não	**42**	
43	Ir ao cinema ou teatro **1**- Sim **2-** Não	**43**	
44	Ler livros ou jornais **1**- Sim **2-** Não	**44**	
45	Momentos diversos de lazer **1**- Sim **2-** Não	**45**	
46	Navegar na internet **1**- Sim **2-** Não	**46**	
47	Ouvir músicas **1**- Sim **2-** Não	**47**	
48	Participar de rituais religiosos/ espirituais **1**- Sim **2-** Não	**48**	
49	Perspectiva quanto ao futuro **1**- Sim **2-** Não	**49**	
50	Pintar **1**- Sim **2-** Não	**50**	
51	Praticar esportes **1**- Sim **2-** Não	**51**	
52	Realizar sonhos	**52**	

	1- Sim **2-** Não		
53	Sair com os amigos **1**- Sim **2-** Não	**53**	
54	Satisfação com suas conquistas **1**- Sim **2-** Não	**54**	
55	Ser otimista **1**- Sim **2-** Não	**55**	
56	Ter condição financeira desejável **1**- Sim **2-** Não	**56**	
57	Ter consciência tranquila **1**- Sim **2-** Não	**57**	
59	Ter emprego **1**- Sim **2-** Não	**59**	
59	Trabalhar **1**- Sim **2-** Não	**59**	
60	Viajar **1**- Sim **2-** Não	**60**	
61	Outro (especifique):_____	**61**	
No momento, o que tem te deixado INFELIZ?			
62	Corrupção **1**- Sim **2-** Não	**62**	
63	Desilusão amorosa **1**- Sim **2-** Não	**63**	
64	Estar abaixo do peso **1**- Sim **2-** Não	**64**	
65	Estar acima do peso **1**- Sim **2-** Não	**65**	
66	Estar com baixa auto-estima **1**- Sim **2-** Não	**66**	
67	Estar com fome **1**- Sim **2-** Não	**67**	
68	Estar com sono **1**- Sim **2-** Não	**68**	
69	Estar desempregado **1**- Sim **2-** Não	**69**	
70	Estar doente **1**- Sim **2-** Não	**70**	
71	Falta de reconhecimento pessoal **1**- Sim **2-** Não	**71**	
72	Falta de reconhecimento profissional **1**- Sim **2-** Não	**72**	
73	Ficar sem internet **1**- Sim **2-** Não	**73**	
74	Ficar sozinho **1**- Sim **2-** Não	**74**	
75	Inflação **1**- Sim **2-** Não	**75**	
76	Medo de morrer **1**- Sim **2-** Não	**76**	
77	Medo de perder o emprego **1**- Sim **2-** Não	**77**	
78	Morte de um familiar/amigo **1**- Sim **2-** Não	**78**	
79	Não ter a condição financeira desejada **1**- Sim **2-** Não	**79**	
80	Não ter acesso a serviços de saúde **1**- Sim **2-** Não	**80**	
81	Não ter um(a) companheiro(a) **1**- Sim **2-** Não	**81**	

82	Política **1**- Sim **2-** Não	**82**	
83	Sobrecarga de trabalho **1**- Sim **2-** Não	**83**	
84	Ter dívidas **1**- Sim **2-** Não	**84**	
85	Ter familiares/amigos doentes **1**- Sim **2-** Não	**85**	
86	Ter insônia **1**- Sim **2-** Não	**86**	
84	Ter preocupações diversas **1**- Sim **2-** Não	**84**	
88	Ter um olhar pessimista **1**- Sim **2-** Não	**88**	
89	Ter um vício **1**- Sim **2-** Não	**89**	
90	Transporte público **1**- Sim **2-** Não	**90**	
91	Violência **1**- Sim **2-** Não	**91**	
92	No geral, você se considera: **4-** Muito infeliz **2-** Infeliz **3-** Mais ou menos feliz **4-** Feliz **5-** Muito feliz	**92**	
93	O que ainda falta para você ser mais feliz? **Descrever**; **99**- Ignorado	**93**	
94	Como você considera a sua saúde? **1-** Muito ruim **2-** Ruim **3-** Nem ruim nem boa **4-** Boa **5-** Muito Boa	**94**	
95	Dentre os problemas de saúde abaixo, selecione aquele que você é portador (para o qual toma algum medicamento ou teve o diagnóstico feito por médico): **1-** Não tenho atualmente e nunca tive problema de saúde importante **2-** Câncer (ATUALMENTE EM TRATAMENTO) **3-** Câncer (DIAGNOSTICADO E COM TÉRMINO DE TRATAMENTO HÁ MENOS DE 5 ANOS) **4-** Câncer (DIAGNOSTICADO E COM TÉRMINO DE TRATAMENTO HÁ MAIS DE 5 ANOS) **5-** Cirrose hepática **6-** Hipertensão (Pressão alta) **7-** Problemas nas coronárias **8-** Diabetes com complicações **9-** Diabetes sem complicações **10-** Problemas pulmonares crônicos (DPOC, Enfisema pulmonar) **11-** Insuficência cardíaca **12-** Insuficiência renal com diálise **13-** Insuficiência renal sem diálise **14-** Sequela de Derrame Cerebral **15-** Depresssão **16-** Ansiedade **17-** Síndrome do Pânico **18-** Outro problema psiquiátrico ou psicológico 1**9-** Outro problema de saúde_____	**95**	
Se você tem ou já teve câncer, responda a questão abaixo:			
96	Para responder a esta pergunta, considere sua vida desde o momento em que foi diagnosticado com câncer até o dia de hoje. Você acredita que o fato de ter (ou ter tido) câncer influencia (ou) na sua sensação de FELICIDADE? **1**- Tenho me sentido muito menos feliz **2**- Tenho me sentido um pouco menos feliz **3**- Não influenciou em nada (não me sinto nem mais nem menos feliz) **4**- Tenho me sentido um pouco mais feliz **5**- Tenho me sentido muito mais feliz **99-** Não se aplica (o participante nunca teve câncer)	**96**	

Anexo U – Índice de Felicidade de Pemberton – PHI

ÍNDICE DE FELICIDADE DE PEMBERTON (PHI) – Português Universal

Usando a seguinte escala de 0 a 10, em que 0 significa "Discordo Totalmente" e 10 "Concordo Totalmente", diga em que medida está de acordo com as seguintes afirmações.
LEIA ATENTAMENTE CADA UMA DAS AFIRMAÇÕES selecionando uma resposta para cada.

Discordo Totalmente										Concordo Totalmente
0	1	2	3	4	5	6	7	8	9	10

1.	Sinto-me muito satisfeito/a com a minha vida	0 1 2 3 4 5 6 7 8 9 10
2.	Tenho energia suficiente para cumprir as minhas tarefas do dia a dia	0 1 2 3 4 5 6 7 8 9 10
3.	Penso que a minha vida é útil e valiosa	0 1 2 3 4 5 6 7 8 9 10
4.	Sinto-me satisfeito/a comigo mesmo/a	0 1 2 3 4 5 6 7 8 9 10
5.	A minha vida está repleta de aprendizagens e desafios que me fazem crescer	0 1 2 3 4 5 6 7 8 9 10
6.	Sinto-me muito ligado/a às pessoas que me rodeiam	0 1 2 3 4 5 6 7 8 9 10
7.	Sinto-me capaz de resolver a maioria dos problemas do meu dia a dia	0 1 2 3 4 5 6 7 8 9 10
8.	Penso que posso ser eu mesmo/a nas coisas realmente importantes	0 1 2 3 4 5 6 7 8 9 10
9.	Desfruto muito das pequenas coisas todos os dias	0 1 2 3 4 5 6 7 8 9 10
10.	Tenho muitos momentos ruins/maus durante o meu dia a dia	0 1 2 3 4 5 6 7 8 9 10
11.	Penso que vivo em uma sociedade que me permite desenvolver plenamente o meu potencial	0 1 2 3 4 5 6 7 8 9 10

Assinale agora quais das seguintes coisas aconteceram com você ONTEM:

12. Senti-me orgulhoso/a com algo que fiz	SIM □ NÃO □
13. Em alguns momentos senti-me muito sobrecarregado/a	SIM □ NÃO □
14. Fiz alguma coisa divertida com alguém	SIM □ NÃO □
15. Estive aborrecido/a grande parte do tempo	SIM □ NÃO □
16. Fiz algo que realmente me deu muito prazer	SIM □ NÃO □
17. Estive preocupado/a com assuntos pessoais	SIM □ NÃO □
18. Aprendi algo interessante	SIM □ NÃO □
19. Aconteceram coisas que me deixaram realmente com raiva	SIM □ NÃO □
20. Permiti-me um mimo/um agrado	SIM □ NÃO □
21. Senti-me desrespeitado/a por alguém	SIM □ NÃO □

Anexo V - Escala de Satisfação com a Vida – ESV

Escala de Satisfação com a Vida

Instruções

Abaixo você encontrará cinco afirmações com as quais pode ou não concordar. Usando a escala de resposta a seguir, que vai de 1 a 7, indique o quanto concorda ou discorda com cada uma; escreva um número no espaço ao lado da afirmação, segundo sua opinião. Por favor, seja o mais sincero possível nas suas respostas.

7 = Concordo totalmente
6 = Concordo
5 = Concordo ligeiramente
4 = Nem concordo nem discordo
3 = Discordo ligeiramente
2 = Discordo
1 = Discordo totalmente

1._____Na maioria dos aspectos, minha vida é próxima ao meu ideal.
2._____As condições da minha vida são excelentes.
3._____Estou satisfeito(a) com minha vida.
4._____Dentro do possível, tenho conseguido as coisas importantes que quero da vida.
5._____Se pudesse viver uma segunda vez, não mudaria quase nada na minha vida.

Anexo W – Escala de Afeto Positivo e Afeto Negativo - EAPN

Escala de Afetos Positivos e Negativos

INSTRUÇÕES. A seguir você encontrará uma lista com dez **estados emocionais**. Para cada uma deles, pedimos-lhe que **indique o quanto você o tem experimentado *ultimamente***. Faça isso escrevendo um número no espaço ao lado de cada emoção / adjetivo, segundo a escala de resposta abaixo, de acordo com a sua opinião. Por favor, seja o mais sincero e honesto possível nas suas respostas.

1 Nada	2 Muito Pouco	3 Pouco	4 Mais ou menos	5 Bastante	6 Muito	7 Extremamente

01. _____ Feliz
02. _____ Deprimido
03. _____ Satisfeito
04. _____ Frustrado
05. _____ Raivoso
06. _____ Divertido
07. _____ Preocupado
08. _____ Otimista
09. _____ Infeliz
10. _____ Alegre

Anexo X - Termo de Consentimento Livre e Esclarecido (inserido como primeira questão do instrumento de avaliação) para *SurveyMonkey®*

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO (TCLE)
PARA PARTICIPAÇÃO EM PESQUISA

TÍTULO DO ESTUDO:
Avaliação dos índices de felicidade, satisfação com a vida e afetos positivos e negativos em pacientes com câncer e pessoas da população geral: estudo transversal utilizando ferramenta on-line.

PESQUISADORES:
Hospital de Câncer de Barretos, Brasil
Carlos Eduardo Paiva, Mayara Goulart de Camargos, Bianca Sakamoto Ribeiro Paiva

O QUE É ESTE DOCUMENTO?
Você está sendo convidado(a) a participar deste estudo que será realizado pelo Grupo de Pesquisas em Qualidade de Vida do Hospital de Câncer de Barretos - Fundação Pio XII. Este documento é chamado de "Termo de Consentimento Livre e Esclarecido" e explica este estudo e qual será a sua participação, caso você aceite o convite. Este documento também fala os possíveis riscos e benefícios se você quiser participar, além de dizer os seus direitos como participante de pesquisa. Após analisar as informações deste Termo de Consentimento e esclarecer todas as suas dúvidas, você terá o conhecimento necessário para tomar uma decisão sobre sua participação ou não neste estudo. Não tenha pressa para decidir. Se for preciso, leve para a casa e leia este documento com os seus familiares ou outras pessoas que são de sua confiança.

POR QUE ESTE ESTUDO ESTÁ SENDO FEITO?
O número de pesquisas interessadas em descobrir o que é felicidade e o quanto as pessoas são felizes vêm crescendo ao longo dos anos. Uma das afirmações de maior consenso é de que o ser humano está sempre em busca da felicidade, independente do modo como ele a entenda. A medição da felicidade poderá acrescentar mais informações aos pesquisadores, permitindo um melhor conhecimento das pessoas brasileiras em um contexto holístico do ser humano (conhecimento completo do ser humano enquanto pessoa). A felicidade, da maneira como este estudo pretende avaliar, ainda não foi avaliada na população brasileira. Assim, este estudo se justifica pela ausência de informações relacionadas a este importante construto da qualidade de vida: a sensação de felicidade.

O QUE ESTE ESTUDO QUER SABER?
Este estudo espera definir o percentual de brasileiros adultos, das cinco regiões do Brasil (Norte, Sul, Sudeste, Nordeste e Centro-Oeste), que se consideram felizes e ainda, definir qual é o perfil do brasileiro feliz. Pretende-se também comparar os níveis de felicidade, satisfação com a vida e afetos positivos (como divertido, otimista, alegre, feliz) e afetos negativos (triste, frustrado, deprimido, etc) entre pessoas de diferentes regiões e níveis de desenvolvimento humano.

O QUE ACONTECERÁ COMIGO DURANTE O ESTUDO?
Caso aceite participar deste estudo, você irá clicar no botão "Aceito participar" e posteriormente será direcionado a uma nova página com a primeira pergunta do estudo. As questões estarão disponíveis através do programa *SurveyMonkey®* (tipo de programa disponível na internet que envia questionários de forma *on-line*). Você responderá a três questionários, contendo no total 36 questões sobre seu bem-estar, sua felicidade, sua satisfação com a vida e afetos positivos e negativos, e um com 32 questões sobre dados sóciodemográficos e clínicos e associados potencialmente à sua felicidade. Acreditamos que você irá demorar aproximadamente 25 minutos para responder os questionários. As perguntas apresentam critérios de lógica, assim, dependendo de suas respostas, algumas questões seguintes poderão ser "puladas". Assim, provavelmente será perguntado a você apenas uma parte das questões.

HAVERÁ ALGUM RISCO OU DESCONFORTO SE EU PARTICIPAR DO ESTUDO?

Os riscos associados a este estudo são mínimos. É possível que alguma pergunta o faça se sentir triste ou desanimado, por fazer referência a alguma situação desgastante emocionalmente. No entanto, este risco, que é mínimo, pode ser considerado semelhante ao risco de ficar triste ou desanimado com conversas habituais (do dia a dia) com outras pessoas de sua convivência. Caso aceite participar, a única informação que poderá identificá-lo será o IP do computador que você utilizar para responder o estudo. Desta forma, existe um risco mínimo de que outras pessoas, não relacionadas ao estudo, tenham acesso às suas informações (quebra da confidencialidade). No entanto, os pesquisadores se comprometem a resguardar seu anonimato. Apenas as pessoas envolvidas no estudo poderão avaliar suas informações que deverão ser identificadas apenas por um código específico do estudo.

HAVERÁ ALGUM BENEFÍCIO PARA MIM SE EU PARTICIPAR DO ESTUDO?
É possível que este estudo não traga benefícios diretos a você. Mas ao final deste estudo, as informações que ele gerar poderão trazer benefícios a outras pessoas.

QUAIS SÃO AS OUTRAS OPÇÕES SE EU NÃO PARTICIPAR DO ESTUDO?
A sua participação neste estudo é voluntária e não é obrigatória. Você pode aceitar participar do estudo e depois desistir a qualquer momento. Você também poderá pedir a qualquer momento que as suas informações sejam excluídas completamente deste estudo e que elas não sejam usadas para mais nada. Você tem o direito de não a responder as perguntas que ocasionem constrangimentos de alguma natureza.

QUAIS SÃO OS MEUS DIREITOS SE EU QUISER PARTICIPAR DO ESTUDO?
Você tem direito a:

1) Receber as informações do estudo de forma clara (utilizando o contato do pesquisador principal por e-mail);
2) Ter oportunidade de esclarecer todas as suas dúvidas (utilizando o contato do pesquisador principal por e-mail);
3) Ter o tempo que for necessário para decidir se quer ou não participar do estudo;
4) Ter liberdade para recusar a participação no estudo, e isto não trará qualquer de problema para você;
5) Ter liberdade para desistir e se retirar do estudo a qualquer momento;
6) Ter direito a reclamar indenização se ocorrer algum dano por causa do estudo;
7) Ter respeitado o seu anonimato (confidencialidade);
8) Ter respeitada a sua vida privada (privacidade);
9) Ter liberdade para não responder perguntas que incomodem você.

SE EU TIVER DÚVIDAS SOBRE OS MEUS DIREITOS OU QUISER FAZER UMA RECLAMAÇÃO, COM QUEM EU FALO?
Fale diretamente com o Comitê de Ética em Pesquisa do Hospital de Câncer de Barretos. Este comitê é formado por pessoas que analisam a parte ética dos estudos e autorizam ele acontecer ou não. Você pode entrar em contato com este Comitê por telefone (tel: (17) 3321-0347 ou (17) 3321-6600 - ramal 6647), *e-mail* (cep@hcancerbarretos.com.br), carta (Rua Antenor Duarte Vilela, 1331, Instituto de Ensino e Pesquisa, 14784-057) ou pessoalmente. O horário de atendimento é de 2ª a 5ª feira, das 8h00 às 17h00, e 6ª feira, da 8h00 às 16h00. O horário de almoço é de 12h00 às 13h00.

SE EU TIVER DÚVIDAS SOBRE O ESTUDO, COM QUEM EU FALO?
Fale diretamente com o pesquisador responsável. As formas de contato estão abaixo:
Nome do pesquisador: Carlos Eduardo Paiva
Formas de contato: Telefone: +55-17-3321-6600 Ramal: 7075; *E-mail*: drcarlosnap@gmail.com

DECLARAÇÃO DE CONSENTIMENTO
Eu entendi o estudo. Tive a oportunidade de ler o Termo de Consentimento ou alguém leu para mim. Tive o tempo necessário para pensar, fazer perguntas e falar a respeito do estudo com outras pessoas. Autorizo a minha participação na pesquisa. Ao clicar no botão “Aceito participar”, não abro mão de nenhum dos meus direitos.

Anexo Y - Artigo de Validação da PHI em português publicado na Revista *Medicine (Baltimore)* em Agosto/2016

Observational Study

Medicine

OPEN

The Pemberton Happiness Index

Validation of the Universal Portuguese version in a large Brazilian sample

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Abstract

The Pemberton Happiness Index (PHI) is a recently developed integrative measure of well-being that includes components of hedonic, eudaimonic, social, and experienced well-being. The PHI has been validated in several languages, but not in Portuguese. Our aim was to cross-culturally adapt the Universal Portuguese version of the PHI and to assess its psychometric properties in a sample of the Brazilian population using online surveys.

An expert committee evaluated 2 versions of the PHI previously translated into Portuguese by the original authors using a standardized form for assessment of semantic/idiomatic, cultural, and conceptual equivalence. A pretesting was conducted employing cognitive debriefing methods. In sequence, the expert committee evaluated all the documents and reached a final Universal Portuguese PHI version. For the evaluation of the psychometric properties, the data were collected using online surveys in a cross-sectional study. The study population included healthcare professionals and users of the social network site Facebook from several Brazilian geographic areas. In addition to the PHI, participants completed the Satisfaction with Life Scale (SWLS), Diener and Emmons' Positive and Negative Experience Scale (PNES), Psychological Well-being Scale (PWS), and the Subjective Happiness Scale (SHS). Internal consistency, convergent validity, known-group validity, and test–retest reliability were evaluated. Satisfaction with the previous day was correlated with the 10 items assessing experienced well-being using the Cramer *V* test. Additionally, a cut-off value of PHI to identify a "happy individual" was defined using receiver-operating characteristic (ROC) curve methodology.

Data from 1035 Brazilian participants were analyzed (health professionals = 180; Facebook users = 855). Regarding reliability results, the internal consistency (Cronbach alpha = 0.890 and 0.914) and test–retest (intraclass correlation coefficient = 0.814) were both considered adequate. Most of the validity hypotheses formulated a priori (convergent and know-group) was further confirmed. The cut-off value of higher than 7 in remembered PHI was identified (AUC = 0.780, sensitivity = 69.2%, specificity = 78.2%) as the best one to identify a happy individual.

We concluded that the Universal Portuguese version of the PHI is valid and reliable for use in the Brazilian population using online surveys.

Abbreviations: ANOVA = analysis of variance, AUC = area under the curve, PHI = Pemberton Happiness Index, PNES = Positive and Negative Experience Scale, PWS = Psychological Well-being Scale, ROC = receiver-operating characteristic, SHS = Subjective Happiness Scale, SWLS = Satisfaction with Life Scale, UN = United Nations.

Keywords: happiness, instrument, subjective well-being, survey, validation

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Authors' contributions: BSRP, MGC, and CEP participated in the design of the study. BSRP, MGC, and CEP collected and analyzed the data. All authors participated in the interpretation of the results, the writing of the manuscript, and review and approval of the final manuscript. All authors had full access to all the data, including statistical reports and tables, in the study and can take responsibility for the integrity of the data and the accuracy of the data analysis.

The authors have no conflicts of interest to disclose.

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1. Introduction

The number of studies aiming at discovering what happiness is and how happy people are has increased over time. There are many definitions of happiness, most of which allude to a positive emotional state, including feelings of well-being and pleasure, as well a fulfilling satisfactory life.[1,2] Subjective well-being has been defined as "a person's cognitive and affective evaluations of his or her life as a whole"[3]; "happiness" and "subjective well-being" can be considered synonymous and are used interchangeably in the present paper. One of the findings with the widest consensus is that human beings actively look for to increase or to maintain their personal well-being independently from the meaning each individual attributes to it.[4–6]

The relevance of human happiness is supported by the fact that United Nations (UN) passed a resolution recognizing the pursuit of happiness as a fundamental human goal. More than an individual endeavor, the UN emphasizes the importance of public policies to promote well-being and encourage each country to elaborate measures of happiness reflecting their own characteristics.[7]

Several studies sought to correlate the determinants of subjective well-being with personal experiences. Some recent research found a strong relationship between a person's positive or negative experiences and his or her state of physical and mental health. Therefore, emotional constructs demonstrate the different ways individuals react to stressing or negative events that can affect their physical health.[8,9]

Subjective well-being is typically measured based on self-report data.[10] Different questionnaires have been developed for this purpose without a gold-standard measure. Among several instruments available to measure happiness[2,11–14] we identified and selected the Pemberton Happiness Index (PHI),[15] as it was initially designed as a comprehensive measure of well-being using a cross-cultural approach. The PHI has demonstrated adequate psychometric properties (good internal consistence, single-factor structure, and adequate convergent and incremental validity), and has been previously validated in 7 different languages, but not in Portuguese language. The PHI consists of 11 items related to different domains of remembered well-being (i.e., general, hedonic, eudaimonic, and social well-being) and 10 items related to experienced well-being (i.e., positive and negative events that occurred the day before). As the PHI exhibits satisfactory psychometric properties, this simple and integrative index may be used as an instrument to monitor changes in subjective well-being in future clinical and population studies.[15] Of note, we are particularly interested in its potential use as an online validated tool, as it would ease to collect data in larger and diverse samples with lower costs.

The aims of the present study were to cross-culturally adapt the Universal Portuguese version of the PHI and to assess its psychometric properties in a large sample of the Brazilian population using online surveys.

2. Methods

2.1. Study design and participant selection

This cross-sectional study applied techniques for the adaptation and validation of the assessment instrument. The data were collected from November 2014 to November 2015 using SurveyMonkey. The study population included professionals from the Barretos Cancer Hospital (HCB, Barretos, São Paulo, Brazil), a reference center for cancer care in Brazil, and users of the social network site Facebook (Facebook, Inc., Menlo Park, CA; http://www.facebook.com) from several Brazilian regions across the whole country. Individuals above 18 years old from both genders were included.

2.2. Sample

Two different samples were analyzed together: Sample 1 consisted of 180 professionals of a large Oncology hospital (HCB), and Sample 2 consisted of 855 individuals from the Brazilian general population. The total combined sample consisted of 1035 participants. Given that a separate data analyses using item response theory was planned, but not reported in the present paper, a sample of at least 1000 individuals was judged statistically robust for that analyses.

2.3. Ethical issues

The study was performed in accordance with the ethical standards of the Declaration of Helsinki and the Brazilian National Health Council Resolution no. 466/2012 and was approved by the Ethics Committee of the Barretos Cancer Hospital (no. HCB 886/2014 and 940/2015). Volunteers manifested their agreement to participate in the study via the informed consent form included in the survey form.

2.4. Data collection

Sample 1: E-mails were sent to 372 health professionals whose e-mail addresses were registered with the hospital, explaining the study and containing a link that directed the participants to the survey. Invitations were sent up to 4 times at 1-week intervals.

Sample 2: The survey link, along with an invitation to participate, was published on the personal Facebook profile pages of 3 of the authors (BSRP, MGC, and CEP). Participants were also encouraged to share the link on their own pages, thus spreading the link among potential participants. Only participants who had complete data on all the questionnaire variables used were entered in the analyses.

After clicking the study link, the respondents in both Samples 1 and 2 were directed to the study's page on the online program SurveyMonkey by registering on the site (https: //pt.surveymonkey.com).

To assess the test–retest reliability, a second e-mail was sent to the healthcare professionals 15 days after the first one. This time interval for the retest was chosen according with Terwee et al[16] and based on previous similar validation studies.[17–19]

2.5. Instrument under validation

2.5.1. Pemberton Happiness Index (PHI). The PHI was designed to measure happiness in the general population. It consists of 11 items related to remembered well-being, each with a 11-point Likert scale, and 10 items related to experienced well-being (positive and negative events that occurred the day before), with dichotomous response options (yes/no). Although initially developed covering hedonic, eudaimonic, and social aspects of well-being, the remembered well-being scale of PHI is considered unidimensional. The remembered well-being score is calculated with the mean score of the first 11 items (items r1 to r11) and may vary from 0 to 10; the 10 items from the experienced well-being (items e1 to e10) is converted into a single score from 0 (zero positive experiences and 5 negative experiences) to 10 (5 positive experiences and no negative experiences). Thus, PHI produces

both remembered and experienced well-being scores, and the sum of the corresponding scores produces a combined well-being index (total PHI). In previous validation studies, Cronbach alpha (internal consistency) was 0.82 to 0.83.[15]

2.6. Validation measures

The following instruments were selected because they have been widely used worldwide and have been previously validated in Brazil. Additionally, they were used as validation measures in the initial validation study of PHI.[15] Both the Satisfaction with Life Scale (SWLS) and the Subjective Happiness Scale (SHS) were chosen to be used in the present study in order to correlate general and social aspects of well-being with the PHI scores (items r1, r2, and r11); the Diener and Emmons' Positive and Negative Experience Scale (PNES) was used to correlate hedonic negative and positive affect scores with the PHI scores (items r9 and r10); and the Psychological Well-being Scale (PWBS) was used to correlate eudaimonic construct measures with the PHI scores (items r3 to r8). Detailed characteristics of the validation instruments are described below.

2.6.1. Satisfaction with Life Scale (SWLS). The SWLS consists of 5 items that assess the cognitive component of SWLS that are answered on a 7-point scale ranging from a score of 1 (strongly disagree) to 7 (strongly agree).[20] In the Brazilian validation study,[21] the SWLS was named *Escala de Satisfação com a Vida* (*ESV*) and exhibited a Cronbach alpha of 0.89. It is a brief, simple, and multiple-item scale with a single-factor structure, which makes SWLS the most widely used instrument to assess global satisfaction with life. It has been applied in various languages and cultures exhibiting satisfactory psychometric properties.[22,23] It has been validated using Internet surveys.[24]

2.6.2. Diener and Emmons' Positive and Negative Experience Scale (PNES). The Diener and Emmons' PNES assesses positive and negative affect by inquiring as to the extent to which respondents experienced each of the listed emotions (1 none, 7 extremely) in the past days. The original version of the scale consisted of 9 items, 4 for positive affect and 5 for negative affect.[25] To balance the number of items in the 2 subscales, the adjective "optimist" was added to the list of positive affects in the Brazilian version, thus increasing the number of items to 10. In the modified Brazilian Diener and Emmons' PNES (with addition of the adjective "optimist"), both the negative ($\alpha = 0.78$) and positive ($\alpha = 0.81$) experience scales exhibited high internal consistency.[26]

2.6.3. Psychological Well-being Scale (PWBS). The 6 dimensions of the construct psychological well-being were established based on humanistic-existentialist theories of human development and mental health, resulting in the PWBS,[27] known in Brazil as *Escala de Bem-estar Psicológico* (*EBEP*). The scale consists of 36 items and 6 dimensions that assess eudaimonic well-being: positive relations with others, autonomy, environmental mastery, personal growth, purpose in life and self-acceptance.[28] These dimensions are positively associated with measures of satisfaction with life, positive affect, and balanced affect and are negatively associated with measures of negative affect and depression.

2.6.4. Subjective Happiness Scale (SHS). The SHS is based on the respondents' subjective assessment of their happiness from their own perspective. It consists of 4 items; the first 2 seek to characterize respondents in absolute (how happy they consider themselves to be) and relative (how happy they feel compared to others) terms. The last 2 items describe happy and unhappy individuals, respectively, and respondents are requested to grade the extent to which the characterizations apply to them. The SHS assesses the respondents' overall appreciation of life and their personal feelings of happiness. It has been validated in several countries with different types of samples, and the results indicated high internal consistency and adequate test–retest reliability.[29] It has also been validated using Internet surveys.[24]

2.7. Other assessment instruments (developed for the present study)

Sociodemographic data, including age, gender, marital status, religion, and region of origin, among others, along with self-perceived health and beliefs of optimism/pessimism were included in the survey. In addition, the following question addressing perception of happiness was developed for the present survey: "in general, do you consider yourself as . . . " The possible answers were "very unhappy," "unhappy," "more or less happy," "happy," and "very happy."

2.8. Validation procedures

Two phases were included in the validation procedure:

2.8.1. Phase I—cultural adaptation. The PHI previously translated into universal Portuguese by Hervás and Vázquez[15] had 2 versions constructed following the forward and back-translation procedure.[30] We analyzed both and concluded that a single version should be developed. An expert committee composed of 2 doctors, a nurse, a Portuguese teacher, and 2 biomedical researchers evaluated the 2 versions using a standardized form for assessment of semantic/idiomatic, cultural and conceptual equivalence. Of the 6 members of the expert committee, 2 were born in Portugal and the others in Brazil. The members independently assessed each instrument item and scored them relative to each type of equivalence as follows: (−1) nonequivalent; (0) impossible to assess/I do not know; or (+1) equivalent. Changes were suggested for items scored −1 or 0. The panel met at a later time to discuss the assessments and arrived at a consensus version. A pretesting was conducted in Brazilian participants using a cognitive debriefing with think-aloud method (asking each participant what each item means).[31] After the pretesting, the expert committee evaluated all the documents and reached a final consensus. The final adapted version was discussed and approved by the authors of the original scale.[30]

2.8.2. Phase II—psychometric properties

2.8.2.1. Internal consistency. Internal consistency was assessed using Cronbach alpha coefficient, which should be ≥0.70 to be considered adequate.[16]

2.8.2.2. Test–retest reliability. Test–retest reliability was assessed using the intraclass correlation coefficient; values above 0.70 were rated as adequate.[16]

2.8.2.3. Hypothesis testing (construct validity). Construct validity was assessed by testing the following predefined hypotheses:

(1) *Convergent validity*—We expected that the total PHI and remembered PHI scores would be positively correlated with the global scores on the SWLS and SHS and with the PWBS domains. Correlation coefficients higher than 0.4 were

Table 1

Pearson correlations for remembered well-being items and the PHI's remembered score (excluding experienced well-being).

Domains and subdomains	Reference scales	Correlation coefficient
General well-being	SWLS	$r=0.492$ (item r1)
		$r=0.375$ (item r2)*
	SHS†	$r=0.675$ (item r1)*
		$r=0.434$ (item r2)*
Eudaimonic well-being		
Life meaning	PWBS: purpose in life†	$r=0.659$ (item r3)*
Self-acceptance	PWBS: self-acceptance†	$r=0.614$ (item r4)*
Personal growth	PWBS: personal growth†	$r=0.475$ (item r5)*
Relatedness	PWBS: positive relationships†	$r=0.361$ (item r6)
Competence	PWBS: environmental control†	$r=0.498$ (item r7)*
Autonomy	PWBS: autonomy†	$r=0.345$ (item r8)
Hedonic well-being		
Positive affect	PNES: positive experience	$r=0.521$ (item r9)*
Negative affect	PNES: negative experience	$r=0.381$ (item r10)
Social well-being	SWLS	$r=0.368$ (item r11)
	SHS†	$r=0.418$ (item r11)*

PNES = Positive and Negative Experience scale, PWBS = Psychological Well-being Scale, SHS = Subjective Happiness Scale, SWDL = Satisfaction With Domains of Life, SWLS = Satisfaction with Life Scale.

† PWBS and SHS were applied for only 180 participants.

* Correlation coefficients >0.4.

expected.[32] In addition, we expected positive correlations with the PNES (positive experiences) and negative correlations with the PNES (negative experiences). In addition, similarly to the original development study, analyses of other possible correlations were planned a priori (as described in Table 1).

(2) *Known-group validity*—Known-groups method (also known as extreme-groups method) is one of the approaches of evaluating construct validity. An instrument is considered to exhibit known-groups validity if its scores clearly discriminate between groups of participants with known different features.[16,33] In the present study, the participants were inquired as to whether they are pessimistic, neither pessimistic nor optimistic, or optimistic. Our hypothesis was that the happiness scores would be higher among the optimistic participants compared to all others. A second known-group analysis was performed relative to self-perceived happiness; the participants were divided into 2 groups: not happy and happy. Our hypothesis was that the happiness scores would be higher among the participants self-described as happy compared to the unhappy. Although findings can be considered obvious, the addition of this second know-group analysis were considered important by the authors because compared groups were clearly distinct (extreme) in relation to the construct measured (i.e., happiness). These comparisons were performed using parametric *t* tests and analysis of variance (ANOVA).

2.8.2.4. Assessment of experienced happiness. To validate experienced happiness, the participants were asked: "Overall, how did you feel yesterday?" Possible answers were "very bad," "bad," "neither bad nor well," "well," and "very well." Then, each item of the experiential PHI (5 items describing negative experiences the day before and 5 items describing positive ones) was correlated with the overall perception of the previous day using Cramer *V*.

2.8.3. Determination of a cut-off point to identify happy individuals using the PHI. To establish a cutoff point likely to identify happy individuals accurately, a receiver-operating characteristic (ROC) curve was plotted. The happiness criterion was defined by asking the participants to what extent they considered themselves "very unhappy," "unhappy," "more or less happy," "happy," or "very happy." Categories "very unhappy," "unhappy," and "more or less happy" were analyzed together as "not happy," and categories "happy" and "very happy" were analyzed together as "happy." The mutual accuracy of the total PHI, experienced PHI, and remembered PHI scores was compared following DeLong et al.[34] The sensitivity and specificity values and the positive (LR+) and negative (LR−) likelihood ratios were calculated.

Statistical analyses were performed using SPSS (version 20.0; SPSS, Chicago, IL) and MedCalc (version 14.8.1, MedCalc Software, Ostend, Belgium) statistical softwares. *P*-values below 0.05 were considered statistically significant.

3. Results

3.1. Phase I—cultural adaptation

In the pretesting, 10 patients with cancer (2 were illiterate and 4 had low than 8 years of education) and 5 health professionals answered the scale in "paper and pencil" form and 12 health professionals completed the scale using the online survey. In general, both forms were adequately understood by the participants. Of the 21 items, 8 suffered minor modifications by the expert committee after the pretesting. The original, the translated, and the final versions are presented in Table 2; modifications needed are highlighted in the table.

3.2. Phase II—psychometric properties

3.2.1. Sample. Of the 189 individuals in Sample 1 who responded to the online survey, 180 answered all items, and their data were analyzed (180 of 372, response rate = 48.3%). Most of the participants were female (n = 99, 52.4%), 18 to 39 years old, from Southeastern Brazil and had more than 11 years of formal education. Most of such participants were healthcare professionals (n = 129, 71.6%) (please see Table 3). Regarding Sample 2 (i.e., participants who answered the survey via Facebook), 972 participants accepted to participate in the study and 855 (87.9%) completed all the survey items. Most were female (n = 663, 77.5%), aged 18 to 39 years old, resided in Southeastern Brazil (n = 621, 72.5%), and had more than 11 years of formal education (n = 765, 89.4%), being the largest fraction healthcare professionals (n = 293, 34.2%). Table 3 describes the characteristics of the participants in Samples 1 and 2.

3.2.2. Internal consistency. Taken together data from both samples, Cronbach alpha values were considered adequate: its value was 0.890 (95% confidence interval [CI] 0.890–0.900) when including the experienced well-being score as a different item (11 + 1 items) and 0.914 (95% CI: 0.906–0.922) when including only the 11 items from the remembered PHI domain. Only exclusion of items 10 and 11 somewhat improved the instrument's internal consistency (increasing from 0.914–0.936 in the case of item 10 and to 0.917 in the case of item 11) (Table 4).

3.2.3. Test–retest. Ninety-four of the participants in Sample 1 (49.7%) answered the survey a second time, 14 to 21 days after the first. The value of the intraclass correlation coefficient was 0.814 (95% CI: 0.733–0.873).

Table 2

Description of the original English PHI version, synthesized PHI version, and final Portuguese Universal PHI version.

Item	Original version—English	Portuguese Universal synthesized PHI version—before pretesting	Portuguese Universal final PHI version—after pretesting*
	The Pemberton Happiness Index	Índice de Felicidade de Pemberton	Índice de Felicidade de Pemberton
1	I am very satisfied with my life	Sinto-me muito satisfeito (a) com a minha vida	Sinto-me muito satisfeito/a com a minha vida
2	I have the energy to accomplish my daily tasks	Tenho energia suficiente para cumprir minhas tarefas cotidianas	Tenho energia suficiente para cumprir as minhas tarefas do dia a dia
3	I think my life is useful and worthwhile	Acredito que a minha vida é útil e valiosa	Penso que a minha vida é útil e valiosa
4	I am satisfied with myself	Sinto-me satisfeito (a) comigo mesmo (a)	Sinto-me satisfeito/a comigo mesmo/a
5	My life is full of learning experiences and challenges that make me grow	A minha vida está repleta de aprendizagens e desafios que me fazem crescer	A minha vida está repleta de aprendizagens e desafios que me fazem crescer
6	I feel very connected to the people around me	Sinto-me muito ligado (a) às pessoas que me rodeiam	Sinto-me muito ligado/a às pessoas que me rodeiam
7	I feel I am able to solve the majority of my daily problems	Sinto-me capaz de resolver a maioria dos problemas do meu dia a dia	Sinto-me capaz de resolver a maioria dos problemas do meu dia a dia
8	I think that I can be myself on the important things	Acredito que posso ser eu mesmo (a) nas coisas realmente importantes	Penso que posso ser eu mesmo/a nas coisas realmente importantes
9	I enjoy a lot of little things every day	Desfruto muito das pequenas coisas todos os dias	Desfruto muito das pequenas coisas todos os dias
10	I have a lot of bad moments in my daily life	Tenho muitos momentos ruins durante o meu dia a dia	Tenho muitos momentos ruins/maus durante o meu dia a dia
11	I think that I live in a society that lets me fully realize my potential	Acredito que vivo em uma sociedade que me permite desenvolver plenamente o meu potencial	Penso que vivo em uma sociedade que me permite desenvolver plenamente o meu potencial
12	Something I did made me proud	Senti-me orgulhoso (a) com algo que fiz	Senti-me orgulhoso/a com algo que fiz
13	At times, I felt overwhelmed	Em alguns momentos eu me senti muito sobrecarregado (a)	Em alguns momentos senti-me muito sobrecarregado/a
14	I did something fun with someone	Fiz alguma coisa divertida com alguém	Fiz alguma coisa divertida com alguém
15	I was bored for a lot of the time	Estive aborrecido grande parte do tempo	Estive aborrecido/a grande parte do tempo
16	I did something I really enjoy doing	Fiz algo que realmente me deu muito prazer	Fiz algo que realmente me deu muito prazer
17	I was worried about personal matters	Estive preocupado (a) com assuntos pessoais	Estive preocupado/a com assuntos pessoais
18	I learned something interesting	Aprendi algo interessante	Aprendi algo interessante
19	Things happened that made me really angry	Aconteceram coisas que me deixaram bastante nervoso (a)	Aconteceram coisas que me deixaram realmente com raiva
20	I gave myself a treat	Permiti um capricho a mim mesmo (a)	Permiti-me um mimo/um agrado
21	I felt disrespected by someone	Senti-me desrespeitado (a) por alguém	Senti-me desrespeitado/a por alguém

PHI = Pemberton Happiness Index.
*Minor scale modifications conducted by the expert committee after the pretesting are highlighted in bold font.

3.2.4. Convergent and divergent validity. The PHI total score was positively correlated with the SWLS global score ($r=0.513$, $P<0.001$, n = 1032), the SHS global score ($r=0.646$, $P<0.001$, n = 171), and the PNES positive experience scale ($r=0.523$, $P<0.001$, n = 1032). As expected, the PHI total score was negatively correlated with the PNES negative experience scale ($r=-0.383$, $P<0.001$, n = 1032). The correlations between the PHI total score and the PWS domains varied from 0.284 (autonomy) to 0.699 (purpose in life) (data not shown). In regard to the correlations hypothesized a priori between specific PHI items and the other instruments, 9 out of 14 such correlations exhibited $r>0.4$; however, the r values of the other correlations were close to 0.4 (Table 1).

3.2.5. Known-groups validity. The mean remembered PHI and total PHI scores differed significantly according to the groups of participants in regard to the perception of optimism/pessimism and self-reported happiness, as was hypothesized (Table 5).

3.2.6. Assessment of experienced happiness. The Cramer V coefficients between satisfaction with the previous day and the 10 items assessing experienced well-being (5 positive and 5 negative) were all above 0.3; only the item "Something I did made me proud" had a nonsignificant P-value ($P=0.062$). Two items corresponding to negative experiences were strongly associated with self-perceived satisfaction with the previous day: "I was bored for a lot of the time" (Cramer $V=0.678$, $P<0.001$) and "Things happened that made me really angry" (Cramer $V=0.651$, $P<0.001$) (Table 6).

3.2.7. ROC curves. The area under the curve (AUC) values of the ROC curves plotted to detect happiness (yes vs no) were as follows: experienced PHI (AUC = 0.702, 95% CI: 0.671–0.733), remembered PHI (AUC = 0.780, 95% CI: 0.750–0.807), and total PHI (AUC = 0.747, 95% CI: 0.717–0.776). When compared, the AUC for remembered PHI was significantly larger compared to those for both experienced PHI and total PHI ($P<0.001$ in both) (Fig. 1). The cutoff point with greatest diagnostic accuracy was >7 for remembered PHI (sensitivity = 69.2%, specificity = 78.2%, positive LR = 3.19, and negative LR = 0.39).

4. Discussion

In the present study, the Universal Portuguese version of PHI was first culturally adapted and then validated in a large sample from the Brazilian population. The scale's psychometric properties were considered adequate in light of classic psychometrics.

Internet research is considered a cost- and time-efficient way to access a large number of participants.[24] Moreover, compared to traditional paper-and-pencil formats, Internet data collection has the potential to reduce loss of data and increase participant's privacy, both important characteristics in questionnaire validation studies. In the Sample 2 of our study, 3 of the authors disclosed the invitation to participate in the study on their

Table 3

Characteristics of the study participants.

Characteristic	Sample 1, N = 180 N (%)	Sample 2, N = 855 N (%)	Total, N = 1035 N (%)
Gender			
Female	99 (55.0)	663 (77.5)	762 (73.6)
Male	81 (45.0)	192 (22.5)	273 (26.3)
Marital status			
Married	95 (52.8)	433 (50.6)	528 (51.0)
Widower	0 (0.0)	11 (1.3)	11 (1.1)
Separated	4 (2.2)	54 (6.3)	58 (5.6)
Single	79 (43.9)	355 (41.5)	434 (41.9)
Missing	2 (1.1)	2 (<1.0)	4 (<1.0)
Age, y			
18–29	71 (37.6)	337 (39.4)	408 (39.4)
30–39	83 (43.9)	309 (36.1)	392 (37.9)
40–49	21 (11.1)	119 (13.9)	140 (13.5)
50–59	5 (2.6)	57 (6.7)	62 (6.0)
60–69	0 (0.0)	27 (3.2)	27 (2.6)
70–79	0 (0.0)	4 (0.5)	4 (<1.0)
≥80	0 (0.0)	2 (0.2)	2 (<1.0)
Family income*			
<1	0	4 (0.5)	4 (<1.0)
1–2	10 (5.6)	60 (7.0)	70 (6.8)
2–3	20 (11.1)	66 (7.7)	86 (8.3)
3–5	42 (23.3)	172 (20.1)	214 (20.7)
5–10	31 (17.2)	257 (30.1)	288 (27.8)
10–20	18 (10.0)	192 (22.5)	210 (20.3)
>20	59 (32.8)	104 (12.2)	163 (15.7)
Origin (Brazilian region)			
Southeast	177 (98.3)	621 (72.5)	798 (77.1)
South	1 (0.6)	60 (7.0)	61 (5.9)
North	0	43 (5.0)	43 (4.2)
Northeast	2 (1.1)	62 (7.3)	64 (6.2)
Midwest	0	69 (8.1)	69 (6.7)
Years of formal education			
Less than 8	0 (0.0)	8 (0.9)	8 (<1.0)
8 to 11	4 (2.4)	82 (9.6)	86 (8.1)
More than 11	167 (97.6)	765 (89.4)	962 (91.0)
Profession			
Health professional	129 (71.6)	293 (34.2)	422 (40.7)
Manager	2 (1.1)	48 (5.6)	50 (4.8)
Unemployed	0 (0.0)	27 (3.1)	27 (2.6)
Entrepreneur	0 (0.0)	46 (5.3)	46 (4.4)
Engineer	0 (0.0)	30 (3.5)	30 (2.8)
Administrative tasks	17 (9.4)	36 (4.2)	53 (5.1)
Civil servant	0 (0.0)	104 (12.1)	104 (10.0)
Teacher	0 (0.0)	73 (8.5)	73 (7.0)
Student	15 (8.3)	112 (13.0)	127 (12.2)
Other	17 (9.4)	86 (10.0)	103 (9.9)

* Brazilian minimum wages.

Table 4

Mean scores and internal consistency values.

PHI item	Mean score (SD)	Cronbach α, if item was excluded	Cronbach α
I am very satisfied with my life	6.92 (2.56)	0.898	—
I have the energy to accomplish my daily tasks	6.67 (2.71)	0.901	—
I think my life is useful and worthwhile	7.95 (2.65)	0.898	—
I am satisfied with myself	6.76 (2.66)	0.896	—
My life is full of learning experiences and challenges that make me grow	7.71 (2.67)	0.902	—
I feel very connected to the people around me	7.46 (2.68)	0.904	—
I feel able to solve the majority of my daily problems	7.58 (2.23)	0.904	—
I think that I can be myself on the important things	7.89 (2.31)	0.904	—
I enjoy a lot of little things every day	6.79 (2.64)	0.907	—
I have a lot of bad moments in my daily life	3.58 (2.93)	0.936	—
I think that I live in a society that lets me fully realize my potential	4.99 (2.77)	0.917	—
PHI experiential score	4.35 (1.64)	NA	—
PHI remembered score (11 items)	7.01 (1.93)	—	0.914*
PHI total score (11 + 1 items)	6.58 (1.71)	—	0.890*

NA = not applicable, PHI = Pemberton Happiness Index, SD = standard deviation.

* Cronbach α = 0.890 (95% CI: 0.880–0.900) when including the experiential score as a different item (11 + 1 items) and 0.914 (95% CI: 0.906–0.922) when including only the 11 items from the remembered domain.

personal Facebook pages and asked their friends to share it. Although the dissemination of survey links by e-mail or through online social networks sharing is quite usual, this strategy is a rather unusual approach to the validation of instruments for health assessment. By sharing the invitation with the authors' friends and requesting the latter to share it with their own friends, the survey link quickly spread, and 855 individuals had fully answered the survey 15 days later. Howell et al[24] compared the quality of data collected using "paper-and-pencil," computer-based, and Internet surveys using different measures of subjective well-being and found equivalent results between the different methods of data collection. Similarly, Internet surveys were shared on social-networking Web sites. Given the increasing prevalence of online social networks, future questionnaire validation studies may take advantage of fast dissemination of online surveys. On the other hand, that fact can explain the large proportion of healthcare professionals in the final Sample 2, as the 3 authors are healthcare professionals, and so this potential

Table 5

Known-group validity.

PHI score	Self-report of happiness Mean (SD) Happy (n = 625)	Unhappy (n = 230)	P*	Self-report of optimism/pessimism Optimistic (n = 51)	Neither optimistic nor pessimistic (n = 297)	Pessimistic (n = 507)	P†
Remembered	7.38 (1.76)	5.46 (1.93)	<0.001	7.48 (1.75)	6.14 (1.94)	5.00 (2.07)	<0.001
Total	6.80 (1.60)	5.35 (1.74)	<0.001	6.89 (1.57)	5.82 (1.79)	5.14 (1.78)	<0.001

PHI = Pemberton Happiness Index, SD = standard deviation.

* *T* test.

† ANOVA.

Table 6

Cramer *V* between satisfaction with the events of the day before and the 10 items on experienced well-being (5 negative and 5 positive) (n = 96).

Experienced well-being items	Cramer *V*	*P*
Positive experiences		
Something I did made me proud	0.305	0.062
I did something fun with someone	0.436	0.002
I did something I really enjoy doing	0.402	0.002
I learned something interesting	0.338	0.017
I gave myself a treat	0.338	0.016
Negative experiences		
At times, I felt overwhelmed	0.376	0.005
I was bored for a lot of the time	0.678	<0.001
I was worried about personal matters	0.307	0.047
Things happened that made me really angry	0.651	<0.001
I felt disrespected by someone	0.395	0.005

bias and limitation should be addressed and overcome in future studies.

Regarding the psychometric properties of the Universal Portuguese version of the PHI, the results are quite similar to those reported in the original study of Hervás and Vázquez.[15] The scale was originally developed in Spanish and was simultaneously translated and validated in other 6 languages (i.e., German, English, Swedish, Russian, Turkish, and Japanese) to select its final items from data gathered in 9 countries. The Cronbach alpha values observed in our study (0.890 and 0.914) were very similar to those reported in the original study, which ranged from 0.82 to 0.93. Moreover, in general, the convergent/divergent validity and known-groups indices were considered adequate. Interestingly, and unlike the initial validation study,[15] we conducted a known-group validation analysis relative to the perceptions of happiness and optimism/pessimism.

Population-based intervention strategies within the political–social setting should be employed; and such strategies require adequate tools to measure the resulting benefits. The cut-off point established in the present study for the identification of happy individuals might be useful in future population-based studies using PHI as an instrument to assess happiness. In this case, we suggest that remembered PHI scores higher than 7 should be tentatively considered to identify a "happy" Brazilian individual. However, further studies are needed to confirm the validity of this cut-off value in different populations. In addition to the cut-off point, the identification of the minimal clinically important difference (MCID) might also be useful.

The present study had some limitations. The first limitation derives from the representativeness of the included sample, with inclusion of large proportion of participants with high socio-educational levels (most healthcare professionals), which does not correspond to the Brazilian general population. Although

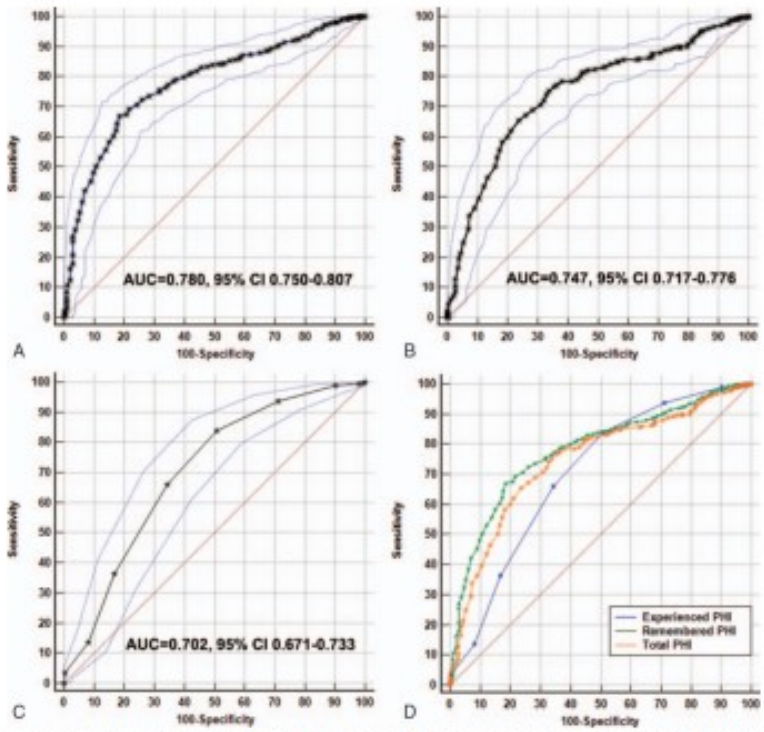

Figure 1. Discrimination of remembered PHI, experienced PHI, and total PHI scores. These receiver-operating characteristic (ROC) curves plot sensitivity versus 1-specificity for detecting individuals classified as happy: (A) remembered PHI score, (B) total PHI score, (C) experienced PHI score, (D) comparison between PHI scores. The area under the curve (AUC) values with 95% confidence intervals are shown in A–C. In D, experienced PHI (green) has the largest area under the curve compared to the other scores ($P < 0.001$ for both comparisons).

large samples can be recruited fast using online social networks with low cost, nonrepresentative samples are a potential limitation. However, we believe that this limitation is minor in validation studies, but potentially more relevant in intervention or cross-cultural studies. Another study limitation is the lack of a Portuguese sample. Although our PHI version is developed to be valid both in Brazil and Portugal (i.e., Universal Portuguese version), it was not tested in participants from Portugal. Thus, currently, it should be considered valid for use only in Brazil, and a subsequent study in Portugal is warranted.

We conclude that the Universal Portuguese version of the PHI is valid and reliable for use in the Brazilian population using online surveys. The cut-off point to define a happy individual was defined, but the MCID should be investigated in future studies.

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Anexo Z - Artigo de comparação da busca da felicidade entre pacientes com câncer, cuidadores informais e indivíduos saudáveis publicado na Revista Journal of Pain And Symptom Management em Junho/2019

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Original Article

What Is Missing for You to Be Happy? Comparison of the Pursuit of Happiness Among Cancer Patients, Informal Caregivers, and Healthy Individuals

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Abstract

Context. After cancer diagnosis, personal value priorities may change in a way that would transform such values and how life is perceived by cancer patients and their caregivers, including happiness and its pursuit.

Objectives. The objective of the study was to analyze and compare what cancer patients, informal caregivers, and healthy population believe that would make them happy.

Methods. A qualitative content analysis was performed on the responses to a single question: "What is missing for you to be happy?" Narratives of cancer patients ($n = 242$, face-to-face interview), informal caregivers ($n = 125$, face-to-face interview), and healthy participants ($n = 1,671$, recruited through social media, online survey) were analyzed. Word clouds were created for each group of participants. Contents were identified and frequencies were compared among participants by means of chi-square and Fisher's exact tests.

Results. Overall, participants were pursuing better health ($n = 288$, 14.1%), better interpersonal relationships ($n = 456$, 22.4%), money ($n = 412$, 20.2%), and work-related aspects ($n = 481$, 23.6%). Cancer patients and informal caregivers sought better health and cure more often than when compared to healthy people ($P < 0.001$). Among cancer patients, survivors' profile tended to be similar to that of the healthy population concerning what they need to be happy. Unexpectedly, "cure" (22.7%) was more frequent among participants with incurable cancer.

Conclusion. Regardless of the group they were in, participants sought happiness in what they considered to be important to their lives, but it was something they did not have at the time of the interview. Psychoeducational and cognitive-behavioral strategies focused on how to deal with life expectations among people facing cancer are awaited. J Pain Symptom Manage 2019;■:■–■. © *2019 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.*

Key Words
Happiness, Subjective well-being, Cancer, Caregiver, Pursuit

Introduction

Happiness is a subjective experience that represents one of the main goals in human life.[1,2] It is an experience of contentment or positive well-being, in association with the feeling that life is good, meaningful, and valuable.[3] Happiness is an internal experience that serves as a basis for each individual to judge his or her own life and "how" and "why" they experience it in a positive manner.[4–6] It is a complex concept for

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which many definitions are available in the literature.[7–9] Although poorly understood, it is hardly pursued.[6,10] In other and simpler words, happiness is the assessment of how much we like the life we live.[9,11] The United States Constitution considers it an unalienable human right[12] and the United Nations a fundamental human goal.[13]

Like "happiness", the term "quality of life" (QOL) is very particular, considered subjective and difficult to define by many authors. For this reason, the World Health Organization defined QOL as "the individual's perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards, and concerns."[14] They further stated that happiness is a widely presumed component of QOL.[14]

The lives of cancer patients and their caregivers may be affected by the cancer diagnosis, which might also influence how they see happiness.[5,15,16] The reason is that these individuals deal routinely with critical issues related to physical, social, emotional, and spiritual aspects,[16–19] in addition to undergoing an unknown and an uncertain experience.[20,21] In this study, informal caregivers are those who provide informal care, that is, they care for or provide help to family, friends, neighbors, or other known health reasons.[22]

Although patients present distressing symptoms associated with disease progression and even changes in QOL, they also report positive emotional states.[5,18,23] Caregivers of cancer patients may also have their lives affected by the cancer diagnosis[24–26] because they help patients deal with functional, clinical, and psychosocial issues.[17] All these factors can play a critical role in their mental health and QOL.[27,28] However, caregivers may also find upsides in these experiences, which may be associated with better outcomes in well-being and levels of happiness.[19,29,30]

This may occur because the subjective well-being of a person may depend on value priorities of individuals.[31] Personal values reflect what is essentially important to a person and therefore form a central part of the individual's identity, guiding his or her action.[32] Experiences that occur during the oncology treatment may help patients in having a greater perception and learning, making them "more aware" of what really matters at the present moment and in the future. Cancer survivors refer to positive aspects of the disease and attribute them to their experience, that is, adaptive strategy, existential growth, and/or behavioral changes.[33] Thus, during this journey, personal value priorities may change in a way that transforms such values and the way life is perceived by cancer patients and their caregivers, including happiness and its pursuit.[34–36]

Most medical literature on oncology has evaluated the impact of cancer and its treatment on the development of negative consequences, that is, anxiety, depression, and distress. However, little research has been done to measure positive psychological change after cancer. With a focus on positive psychology, our hypothesis is that cancer patients, as well as informal caregivers, should consider and point out specific items, but different from those of the general population, to describe what would make them happier.

Given the constant pursuit of happiness by human beings, the aim of the present study was to analyze and compare what the healthy population, cancer patients, and informal caregivers believe would make them happy.

Methods

Study Design

The present study is a part of a larger yet unpublished research project that seeks to investigate the indices of happiness, life satisfaction, and perception of positive and negative effects of the Brazilian population and to identify conditions associated with the individual perception of happiness. This is a qualitative content analysis based on responses to a single question: "What is missing for you to be happy?"

Ethical Issues

The present study complied with resolution no. 466/12 from the Brazilian National Health Council and was duly approved by the Research Ethics Committee at Barretos Cancer Hospital (ruling no. 1.098.789 and 1.114.730). All online and in-person participants read and signed an informed consent form agreeing to voluntary participation.

Eligibility Criteria and Study Participants

Individuals who met all the inclusion and exclusion criteria were included in the study.

For general population, the inclusion criteria included Brazilian nationals; residing in Brazilian municipalities; having a Facebook and/or WhatsApp account. The exclusion criterion was age under 18 years.

For informal caregivers (people who were accompanying cancer patients at the time of the interview, being familiar or not), the inclusion criteria included Brazilian nationals; able to read and write; accompanying a cancer patient (relative or not) during treatment/follow-up at the cancer hospital. The exclusion criteria included age under 18 years old; any relevant neuropsychiatric condition preventing the patient from understanding and answering the health assessment questionnaire.

For cancer patients, the inclusion criteria included histological diagnosis of cancer of any type and clinical stage; age 18 to 75 years old; both sexes; able to read and write; in one of the following treatment phases: no evidence of disease and not receiving cancer treatment for at least two years, receiving systemic

adjuvant treatment, or receiving palliative care exclusively. The exclusion criteria included any relevant neuropsychiatric condition that would prevent patients from understanding and answering the health assessment questionnaire; having hematologic cancer.

Study Setting and Data Collection

The recruitment strategy used was online data collection through the social network Facebook and the WhatsApp application and face-to-face data collection. Participants from the general population of all five Brazilian regions were recruited online via the Facebook social network (three different methodologies were used) and the WhatsApp application. The complete recruitment strategy is described in detail in Supplementary Material 1. The survey was answered on the SurveyMonkey platform. In general terms, the South and Southeast regions of Brazil are wealthier than other regions. In the Northeast region, for example, 40% of the population survives on a minimum wage.

A convenience sample of cancer patients and informal caregivers was interviewed in person using the same evaluation forms answered online. Patients were recruited at the oncology outpatient clinics and informal caregivers at two different institutional support houses, where cancer patients from other locations are lodged while being treated in the city of Barretos. Regarding patients, it was planned that an equal number of participants should be included among the three groups: cancer survivors, undergoing adjuvant treatment, and receiving palliative care exclusively (without antineoplastic treatment).

Data Collection

The present qualitative analysis was based on the responses to a single question: "What is missing for you to be happy?" The participants recruited online via Facebook and WhatsApp answered the survey individually by entering their responses on a SurveyMonkey form. Cancer patients and informal caregivers were interviewed in person in a reserved room and alone, by two trained nurses.

Participants were assessed only once. No interviews were recorded. The data collected online were automatically entered into SurveyMonkey spreadsheets. Responses given in person were transcribed on paper by interviewers during interviews. All the online and transcribed responses were later exported to IBM SPSS Statistics for Windows, version 21.0 (IBM Corp., Armonk, NY) and NVivo qualitative data analysis software, version 11 Pro (QSR International Pty Ltd) programs. Although the time taken to answer the open-ended question was not computed, given the short length of the responses, it was estimated as a few minutes.

Sample Size

Traditionally, qualitative studies are not based on a statistical sample size calculation. However, the present study consisted of a secondary analysis of data collected in a larger, quantitative study with a calculated sample size. In any case, the robust sample size of this study is relevant when considering the intention to investigate the prevalence of narratives among different groups. Although qualitative studies usually analyze long narratives from a few interviewees, the present one was based on short narratives from a large number of participants.

Data Analysis

Word Cloud Analysis. Word clouds can provide easy, quick, and meaningful analysis of qualitative data by providing interpretations through text size and color.[37] In brief, the data were organized by synthesizing the narratives into one or more "words" relevant to topics mentioned in responses (phrase labels). Next, word clouds were generated, which graphically represented narratives and the frequency of words.

Content analysis. A qualitative data analysis was performed based on Bardin's content analysis methodology.[38] The first step was the preanalysis, which consisted of direct and intense contact with the material and organization of the data to meet the evaluation standards, including exhaustiveness, representativeness, homogeneity, and relevance. The next step was to organize the topics according to their relevance and/or repetition (codification and categorization of the data). Word clouds were used by coders as exploratory forms of analysis that helped them to interpret the material. Transcripts were independently coded into categories and subcategories by two researchers (B. S. R. P. and M. G. d. C.); disagreements in coding were resolved during a consensus meeting with three investigators (B. S. R. P., M. G. d. C., and C. E. P.). The quantitative analysis was performed using the program NVivo 11 Pro.

At the end of the aforementioned procedures, investigators found differences in the response patterns among the groups of participants. For this reason, they decided to perform a joint analysis of all groups together and a separate analysis for the following groups:[1] general population,[2] informal caregivers, and[3] cancer patients. The group of patients was also analyzed according to the corresponding phase of

Table 1
Sociodemographic Characteristics of Study Participants ($n = 2580$)

Characteristics	Cancer Patients ($n = 342$), n (%)	Informal Caregivers ($n = 126$), n (%)	General Population ($n = 2112$), n (%)
Gender			
Male	122 (35.7)	28 (22.2)	470 (22.3)
Female	220 (64.3)	98 (77.8)	1642 (77.7)
Race (ethnicity)			
White	207 (60.5)	39 (31.0)	1488 (70.2)
Black	30 (8.8)	18 (14.3)	83 (3.9)
Mulatto	90 (26.3)	67 (53.2)	476 (22.5)
Asian	07 (2.1)	02 (1.6)	55 (2.7)
Missing	08 (2.3)	00 (0.0)	15 (0.7)
Age (yrs)			
18–29	17 (5.0)	28 (22.2)	938 (44.4)
30–39	24 (7.0)	42 (33.3)	699 (33.1)
40–49	68 (19.9)	19 (15.1)	277 (13.1)
50–59	124 (36.3)	27 (21.4)	141 (6.7)
60–69	78 (22.8)	08 (6.3)	47 (2.2)
≥70	30 (8.8)	02 (1.6)	10 (0.5)
Missing	01 (0.2)	00 (0.0)	00 (00)
Marital status			
Married or live married	189 (55.3)	75 (59.5)	1002 (47.4)
Windowed	35 (10.2)	05 (4.0)	24 (1.2)
Separated or divorced	48 (14.0)	08 (6.3)	123 (5.8)
Single	64 (18.7)	38 (30.2)	951 (45.0)
Other/do not know	06 (1.8)	00 (0.0)	12 (0.6)
Region where they live			
North	19 (5.6)	57 (45.2)	168 (8.0)
Northeast	06 (1.8)	18 (14.3)	240 (11.4)
Southeast	264 (77.2)	00 (0.0)	964 (45.6)
Midwest	46 (13.5)	48 (38.1)	179 (8.5)
South	07 (2.0)	03 (2.4)	561 (26.6)
Location where they live			
Urban area	312 (91.2)	101 (80.2)	2060 (97.5)
Rural area	30 (8.8)	25 (19.8)	52 (2.5)
Educational level			
<8 years	186 (54.4)	47 (37.3)	26 (1.2)
8 to 11 years	77 (22.5)	54 (42.9)	218 (10.3)
>11 years	79 (23.1)	25 (19.8)	1866 (88.4)
Missing	00 (0.0)	00 (0.0)	02 (0.1)
Professional activity currently			
Yes	282 (82.5)	115 (91.3)	2030 (96.1)
No	60 (17.5)	11 (8.7)	82 (3.9)

"treatment," namely "cancer survivors," "adjuvant treatment," and "exclusive palliative care." It is noteworthy that palliative care meets the needs of all patients who need symptom relief and the needs of patients and their families for psychosocial and supportive care.[39] They are appropriate for patients diagnosed with incurable diseases, regardless of the supposed survival prognosis of months or years. Exclusive palliative care is indicated when patients are in advanced stages and have a very low chance of being cured or when they are experiencing the terminal phase of the disease.[39]

Frequencies of identified themes (categories and subcategories) were compared among the general population, informal caregivers, and cancer patients by means of the chi-square test or Fisher's exact test. Similarly, frequencies of themes identified in narratives were compared among subgroups of cancer patients. Statistical analysis was performed adopting $P < 0.05$ as the significance level.

Results

Data were collected from October 2015 to October 2016. The final sample comprised 2580 participants: general population, $n = 2112$; cancer patients, $n = 342$; and informal caregivers, $n = 126$. Twenty-six cancer patients and eight informal caregivers were approached by the interviewer but not included in the study. Of those, three cancer patients were in significant emotional distress according to the interviewer's view, which prevented them from participating in the study. Since not all participants in the larger research project answered the question being analyzed in the present study, only the narratives

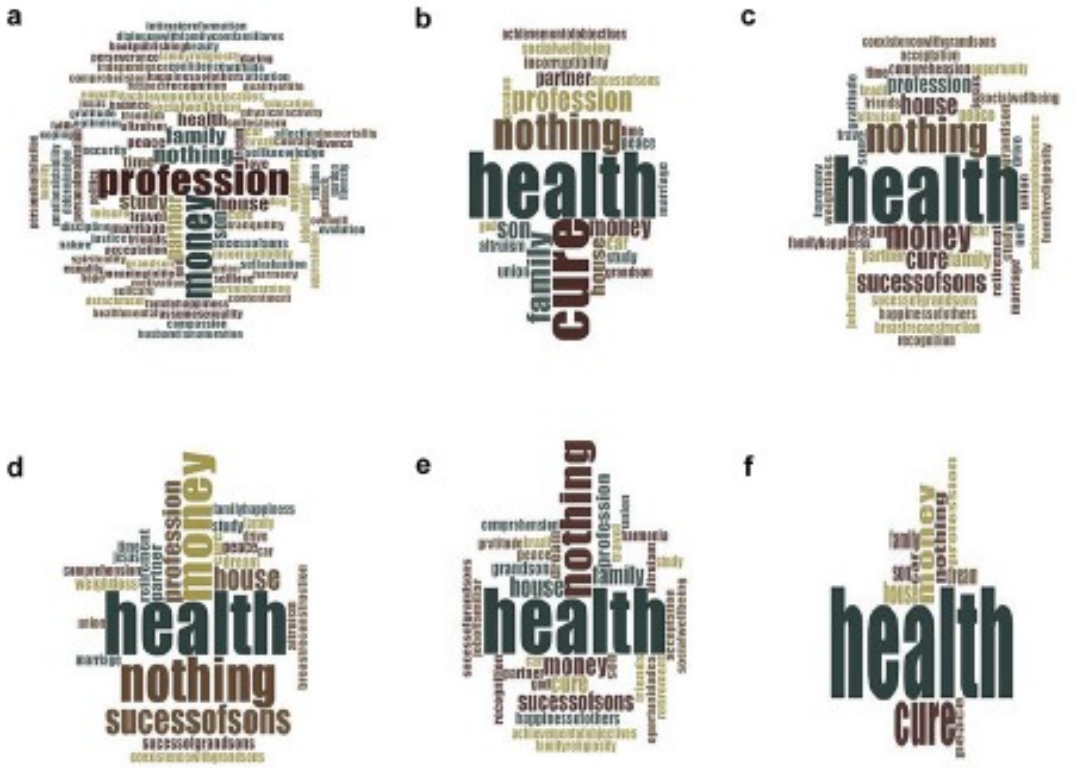

Fig. 1. Word clouds generated using participants' statements concerning their pursuit of happiness. a) Healthy population; b) informal caregivers; c) cancer patients; d) cancer patients, survivors; e) cancer patients, adjuvant treatment; f) cancer patients, exclusive palliative care.

Fig. 2. Graphically description of categories and subcategories based on participants' statements. Categories and subcategories are shown in dark gray circles and light gray circles, respectively. At the center of the figure is the open question of the study "What is missing for you to be happy?"

Table 2
Frequency of Categories and Subcategories Found in the Narrative Analysis per Group

Categories and Subcategories[a]	Full Sample $n = 2038$, n (%)	Type of Participant: Cancer Patients, ($n = 242$), n (%)	Informal Caregivers ($n = 125$), n (%)	General Population ($n = 1671$), n (%)	P-value[c]
Category 1: nothing	252 (11.4)	45 (18.6)	20 (16.0)	166 (9.93)	<0.001
Category 2: better health	288 (14.1)	115 (47.5)	68 (54.4)	105 (6.3)	<0.001
Subcategory 2a: cure	75 (3.6)	19 (7.8)	31 (24.8)	25 (1.4)	<0.001
Category 3: interpersonal relationships	456 (22.4)	20 (8.2)	31 (24.8)	405 (24.2)	<0.001
Subcategory 3a: romantic relationship	186 (9.1)	7 (2.9)	7 (5.6)	172 (10.2)	<0.001
Subcategory 3b: building a family	170 (8.3)	3 (1.2)	6 (4.8)	161 (9.6)	<0.001
Subcategory 3c: family closeness	88 (4.3)	3 (1.2)	15 (12.0)	70 (4.1)	<0.001
Category 4: to "have" to "be"	524 (25.7)	54 (22.3)	17 (13.6)	453 (27.1)	0.002
Subcategory 4a: money	412 (20.2)	35 (9.6)	10 (8.0)	369 (22.1)	<0.001
Subcategory 4b: material things	145 (7.11)	24 (9.9)	7 (5.6)	114 (6.8)	0.165
Category 5: spirituality	59 (2.9)	1 (0.4)	1 (0.8)	57 (3.4)	0.007[b]
Category 7: leisure and rest	106 (5.2)	3 (1.2)	1 (0.8)	102 (6.1)	<0.001[b]
Category 8: work	481 (23.6)	12 (4.9)	9 (7.2)	460 (27.5)	<0.001[b]
Subcategory 8a: learning goals	111 (5.4)	2 (0.8)	2 (1.6)	107 (6.4)	<0.001[b]

[a]Names of categories are abbreviated.
[b]Fisher's exact test.
[c]Chi-square test.

from 2038 participants (79%) were included in the qualitative analysis. Table 1 describes the characteristics of study participants.

Word Clouds

Based on participants' narratives and their synthesis into two or more words relevant to topics addressed in the responses, word clouds were generated for groups and subgroups, which summarized the findings (Figure 1). The clouds included larger (higher frequency) and smaller (lower frequency) words.

The words "profession" ($n = 389$; 16.5%) and "money" ($n = 367$; 15.6%) were more evident in responses given by the general healthy population compared with patients and informal caregivers. In turn, the term "better health" was easily perceptible among patients ($n = 101$; 30.9%) and informal caregivers ($n = 41$; 24.8%). Unexpectedly, the word "cure" ($n = 10$; 19.6%) was more frequent among participants with incurable cancer (palliative care exclusively). Another finding deserving attention is the size of the word "nothing" for cancer patients categorized as "survivors" ($n = 21$; 16.2%) and under "adjuvant treatment" ($n = 22$; 15.1%).

Content Analysis

Nine categories were identified; some of them were further subcategorized. Figure 2 depicts the identified brief categories, and Supplementary Table 1 provides full category names and some illustrative examples. Most participants preferred to respond in short sentences, although they had the opportunity to give longer answers, both in the face-to-face and in the electronic format (up to 1000 characters could be typed in).

Tables 2 and 3 describe the frequencies of categories and subcategories identified in the analysis of the narratives per group and subgroup.

Responses corresponding to category 1, "nothing," were more frequent among patients under adjuvant treatment (22.4%; $P < 0.001$) and survivors (21.0%; $P < 0.001$) compared with patients exclusively under palliative care (4.5%; $P < 0.001$) (Table 3). Although the frequency of category 2, "I wish for health for myself or someone else in order to be happy," did not differ significantly among the subgroups of cancer patients ($P = 0.137$), there was a higher percentage of these responses among informal caregivers (54.4%; $P < 0.001$) and the total population of cancer patients, regardless of the treatment phase (47.5%; $P < 0.001$) (Table 2). Subcategory 2a, "I hope to find in healing a reason to be happy," was more frequent among informal caregivers (24.8%; $P < 0.001$) (Table 2) and cancer patients exclusively under palliative care (22.77%; $P < 0.001$) (Table 3).

Category 3, "Good interpersonal relationships would make me happier", appeared in 20% to 25% of the narratives from participants from the general population ($P < 0.001$), informal caregivers ($P < 0.001$), and survivors ($P = 0.45$) (Tables 2 and 3). In turn, subcategories 3a "I'm looking for a romantic relationship to be happier," 3b "Building a family would make me happier," and 3c "I need to be closer to my family to be happy" were seldom mentioned by the general population ($P < 0.001$), informal caregivers ($P < 0.001$), or cancer patients

Table 3
Frequency of Categories and Subcategories Found in the Analysis of Narratives of Cancer Patients

Categories and Subcategories	Cancer Patients ($n = 242$)			*P* value
	Survivors, *n* (%)	Adjuvant Treatment, *n* (%)	Exclusive Palliative Care, *n* (%)	
Category 1: nothing	21 (21.0)	22 (22.4)	2 (4.5)	<0.001
Category 2: better health	34 (34.0)	46 (46.9)	35 (79.5)	0.157
Subcategory 2a: cure	2 (2.0)	7 (7.1)	10 (22.7)	0.046*
Category 3: interpersonal relationships	20 (20.0)	10 (10.2)	2 (4.5)	0.045*
Category 4: to "have" to "be"	29 (29.0)	17 (17.3)	8 (18.8)	<0.001
Subcategory 4a: money	18 (18.0)	10 (10.2)	5 (11.4)	0.012
Subcategory 4b: material things	12 (12.0)	9 (9.2)	3 (6.8)	0.046*

Categories 5, 6, 7, and 8 and subcategories 3a, 3b, 3c, 3d, and 8a were not included in the table due to their low frequency among cancer patients. Subcategories 9a, 9b, and 9c were not subjected to statistical analysis because they did not occur among cancer patients.
*Fisher's exact test.

($P < 0.001$); the corresponding rates were low, with the maximum being 12% (Table 2). The frequency of these subcategories did not differ significantly among cancer patient subgroups (Table 3).

Category 4, "Having something to be happier," was mentioned in 22% to 29% of the narratives of all participants grouped together ($P = 0.002$), the general health population ($P = 0.002$), all cancer patients ($P = 0.002$), and survivors ($P < 0.001$) (Tables 2 and 3). Subcategory 4a, "Money would make me happier," was more frequent among the general population (22.1%; $P < 0.001$) (Table 2) and survivors (18.0%; $P = 0.012$) (Table 3). Subcategory 4 b, "I need material things to be happy," was more frequent among survivors (12.0%; $P = 0.046$) (Table 3).

Category 8, "Better professional status," was more frequent among the general population (27.5%; $P < 0.001$) (Table 2).

Other categories and subcategories (described in detail in Supplementary Table 1), although with pertinent content for the qualitative analysis, exhibited low frequencies of occurrence.

Discussion

Professional Status and Interpersonal Relationships

Almost 70% of the general healthy population comprised youths and individuals younger than 40 years, which may account for their focus on professional and financial matters. Indeed, the responses of 27.5% of this group fell into the category of "Better professional status." Since work-related activities represent a very large part of everyday life, individuals might come to believe that satisfaction with their professional life has a substantial impact on their happiness.[40]

The responses of 20% to 25% of the general population, informal caregivers, and cancer survivors fell into the category "Good interpersonal relationships would make me happier." Interestingly, this category was less frequent for patients under adjuvant treatment or exclusively under palliative care. Interpersonal relationships are important for happiness.[21,41] However, cancer patients may have other priorities, such as treatment and health, and thus do not consider interpersonal relationships as an important factor. In addition, the literature evidences the improvement of family and friendship relationships during the oncological disease process,[35] suggesting that one might assume that in the presence of a threatening disease, friends and/or family are already close, which thus contributes to the low frequency of this category between these two subgroups.

Perceptible changes in personal value priorities are reported after a cancer diagnosis. Such changes might be considerable and lead patients and informal caregivers to restructure their values and how they perceive life. This can also influence how such individuals conceive of happiness, with possible changes in their expectations for the future and attribution of more value to simpler aspects of everyday life.[34,36] These changes might also reflect uncertainty about the future, which makes individuals, such as patients with chronic diseases, mainly focus on the present and what they consider to be missing.[20,21]

Better Health and Cure

Category 2, "I wish for health for myself or someone else in order to be happy," reinforced the idea conveyed by the word "health" in the word cloud, as its frequency was high in all groups and subgroups except for the general population. This was the category with the highest frequency among all analyzed groups. Other studies evidence the pursuit of health as one of the significant factors to increase happiness among patients with chronic diseases and their caregivers.[21]

Owing to the disease, cancer patients and informal caregivers might be looking for what is missing most: a better health. Despite other countless difficulties with which they have to cope during the complex period of disease and treatment, the recovery of one's own health or the health of a loved one might be what would bring the most happiness to individuals in these two groups. Although it might seem obvious,

these findings show that people seek what is missing in the pursuit of happiness in the present time. As a result, an individual might attribute little value to his or her own health (sedentary behavior, smoking, and so forth) but come to want it very much (in the pursuit of happiness) when ill.

Surprisingly, subcategory 2a, "I hope to find in healing a reason to be happy," was most frequently mentioned by patients exclusively under palliative care, that is, by those who do not have any chance of being cured. This finding points to an inconsistency between awareness of the prognosis and the perception of the intent of the treatment/care received.[42,43] Some factors, alone or jointly, might explain this unrealistic expectation,[44] such as resistance to acceptance,[45,46] denial,[47,48] difficulty understanding prognostic information,[49,50] and gaps in communication by healthcare professionals, who often face the stigma of giving bad news,[51,52] regarding the true goals of exclusive palliative care.

"To Have to Be"

Attention should also be paid to category 4, "Having something to be happier," since it was mainly mentioned by the general population and cancer survivors. A reasonable hypothesis to account for this finding is that cancer survivors gradually approximate the general population over time in terms of general quality of life[18,53] and well-being.[54] The pursuit of happiness, as it concerns the acquisition of things considered to be missing, may be similar between these two groups.

Nothing Is Missing

Many people seemed to be fully happy and answered that nothing was missing for them to be happy. Although this may seem to be a positive result, it may also suggest that people dedicate little time to thinking about themselves. As a result, they do not acknowledge the basic needs of personal growth and accomplishment. Approximately 20% of patients under adjuvant treatment and cancer survivors reported needing nothing else to be happy. This finding may be seen as a form of gratitude to God for being alive; the fact that these individuals overcame, at least temporarily, a threatening condition such as cancer may prevent them from complaining in the presence of an interviewer.

Traditionally, qualitative studies are not based on a statistical sample size calculation. However, the present study consisted of a secondary analysis of data collected in a larger, quantitative study with a calculated sample size. In any case, the robust sample size of this study is relevant when considering the intention to investigate the prevalence of narratives among different groups. Although qualitative studies usually analyze long narratives from a few interviewees, the present one was based on short narratives from a large number of participants.

Study Limitations

The present study has several limitations. First, study populations were subjected to different data collection methods. Live responses to an interviewer—even when duly trained not to interfere in the responses—may be considered a source of bias. In addition, studied populations are distinct from one another, not differing only in function of being a patient with cancer or an informal caregiver. Thus, other conditions related to lifestyle, income, and age should be involved in the pursuit of happiness. Another limitation of the present study, because of its cross-sectional methodology, is the impossibility of evaluating how the perception of what happiness is changes over time.

Conclusions

While cancer patients and informal caregivers desire better health and a cure to be happy, individuals from the general population wish for money, work, and better interpersonal relationships. Among cancer patients, the profile of survivors tended to be similar to that of the general population concerning what they need to be happy. In simple terms, individuals tend to seek what they consider to be important for their lives, but it is missing at the present time. Because it was a cross-sectional study, these were the results found at the time of the research. Additional studies are needed to correlate indices of happiness with perceptions of the pursuit of happiness and to assess the impact of such findings on clinical outcomes over time and among other populations. Psychoeducational and cognitive-behavioral strategies focused on how to deal with life expectations among people facing cancer are awaited, as well as how values are restructured and how life is perceived, which can influence how these individuals conceive of happiness.

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