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The Positive Mental Health Literacy Questionnaire - PosMHLit

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Abstract

Background: Literature suggests that mental health literacy (MHL) promotes good mental health. However, existing measures of MHL do not capture mental well-being and its protective or promoting factors in its definition of good mental health, and almost exclusively focus on mental illness literacy. In this paper, we present the development and validation of the Positive Mental Health Literacy Questionnaire - PosMHLit.

Method: Scale development was built upon an extensive literature review. Generated items were validated by a panel of experts (focus-group and single analysis). Psychometric analyses were conducted in a community sample of adults (N=418). Exploratory Factor Analysis (EFA) and Parallel Analysis (PA) were performed to examine the factor structure of the scale. Correlations between relevant variables (MHL, well-being and psychopathology) were conducted and Pearsons´ quoficients were examined to test construct validity.

Results: Two factors emerged from the EFA: Factor 1 - "*Characteristics and promoters of positive mental health*" (17 items), and Factor 2- "*Vulnerability factors of positive mental health*" (3 items). Both factors show good internal consistency ($\alpha 1 = .92$; $\alpha 2 = .70$, respectively) and construct validity. The use of a total score of the scale should not include the 3 items from Factor 2.

Conclusion: The PosMHLit is a valid and reliable measure to evaluate literacy about positive mental health and well-being in the adult population, but future studies should further replicate these findings. Clinical implications include the provision of a valid measure of positive mental health, which will contribute to the efficacy testing of MHL interventions.

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1. Introduction

Mental health literacy (MHL) has been studied as an empowering tool for the prevention, recognition and management of mental health problems. The MHL construct was introduced by Jorm and colleagues (Jorm et al., 1997; Jorm, 2000), and categorized as the capacity to: a) recognize different mental illnesses and psychological distress; b) understand mental illness as predicted by identifiable causes and risk factors; c) differentiate self-help interventions and professional help available; d) acknowledge the problem and seek for help; d) look for adequate mental health information. A later definition by Kutcher et al. (2016a) also included knowledge on how to obtain and maintain good mental health, even though what constitutes good mental health has not yet been clearly conceptualized.

Research suggests that low MHL is associated with delayed help-seeking behavior, impaired adherence to treatment, worst help-giving and several forms of psychopathology (Bonabi et al., 2016; Brijnath et al., 2016; Lam, 2014; Kutcher et al., 2016; Rüsch et al., 2014; Wei et al., 2015). This seems to indicate that MHL is a relevant construct for mental illness prevention.

Several measures have been developed in order to assess MHL, although presenting both methodological and theoretical problems, such as lack of validation and construct confusion (Spiker & Hammer, 2019; Wei et al., 2016). For this reason, and because MHL as an overall construct entails several other constructs (e.g., knowledge about mental disorders, stigma, positive mental health, help-seeking), Spiker and Hammer (2019) suggest that MHL would be much more successfully conceptualized if though of as a multi-construct, where knowledge about mental disorders and positive mental health would then be measured separately.

In fact, the majority of MHL measures have an illness-oriented understanding of mental health (Mansfield et al., 2020). Most MHL assessment methods (i.e., scales and vignettes) were built under the first MHL definition, which primarily focused on mental illnesses (such as depression, anxiety disorders, personality disorders, psychotic disorders or parental mental illness), stigma about mental disorders and help-seeking (Wei et al., 2015). For example, O´Connor and Casey (2015) developed the Mental Health Literacy Scale (MHLS), which is a unidimensional scale of thirty-five items, rated in both a four-point scale and a five-point scale, measuring knowledge about different types of mental disorders and psychological distress (e.g. anxiety disorders, depression, personality disorders, addiction), risk factors and causes, types of help available, stigma and help-seeking. Although the instrument measures all domains of the first conceptualization of MHL (Jorm et al., 1997) and captures extremely relevant factors for mental

illness prevention, with appropriate psychometric properties, it does not contemplate good mental health understanding, maintenance and promotion. The same is true with The Mental Health Literacy Questionnaire by Campos (MHLq), which was first developed to adolescents and later adapted to adults (Dias et al., 2018). The adolescents' version is composed of thirty-three items rated in a 5-point Likert scale. Three factors capture MHL: first aid skills and help-seeking, knowledge and stereotypes and self-help strategies (a total MHL score can be computed). For the adults' version, twenty-nine items are divided into four dimensions: knowledge of mental health problems, erroneous beliefs/stereotypes, help-seeking and first aid skills, self-help strategies. Although this is a useful instrument where MHL can be similarly measured across different developmental groups using variance analysis, a fundamental aspect remains missing: the assessment of literacy on mental well-being and positive mental health.

The notion of mental health as the mere absence of mental illness that underly several mental health instruments, constrains the distinction between mental health and mental illness, and impairs good mental health promotion. Therefore, one might argue that the existing MHL measures, are in fact mental illness literacy measures.

The conceptualization of mental health/well-being and mental illness as two potentially non-overlapping constructs is both theoretical and empirically supported. Mental health is theoretically operationalized as the presence of well-being, well-functioning and in the capacity for contributing to the community (World Health Organization [WHO], 2005). In fact, empirical data suggests that the absence of mental illness does not necessarily imply the presence of mental well-being (DeVos et al., 2018; Keyes, 2005; Spinhoven et al., 2015). A recent scoping review unequivocally showed that positive mental health and mental illness - measured through mental well-being and mental illness symptoms instruments - are two related but distinct factors (Iasiello et al., 2020). According to this conceptualization of mental health and mental illness as two potentially non-overlapping continuums, illness-focused MHL instruments are missing important segments of mental health by only addressing mental suffering, and not measuring mental well-being. Thus, one clear concern about the measurement of MHL is that it should not only focus on measuring the knowledge of mental illness management and prevention, but also tap into the knowledge of mental health and mental well-being protection and promotion.

The absence of a suitable measure that addresses literacy of mental health/well-being results in the current lack of understanding of the effects of positive mental health literacy, comparatively to what is known about the benefits of mental illness literacy. Indeed, many argue that MHL instruments should capture positive mental health, good mental health or well-being (BjØrnsen

et al., 2017; Kutcher et al., 2016a, 2016b; Mansfield et al., 2020; Spiker & Hammer, 2019; Wei et al., 2015) but none of the existing instruments designed to do so target at the same time a complete mental health definition, involving mental well-being and the factors that allow its promotion and protection. Recently, BjØrnsen et al. (2017) developed the Mental Health Promoting Knowledge (MHPK-10). This self-report instrument was developed for Norwegian adolescents and is composed of a one-dimensional scale, with ten items, rated on a six-point Likert type scale. The measure contemplates the MHL new component proposed by Kutcher, Wei, and Conglio (2016) (i.e., the knowledge necessary to obtain and maintain good mental health) and items cover the importance of training autonomy, competence and relatedness (e.g. "having influence on your own day"; "experiencing school mastery"; "being a good friend"). Although this is a significant and much needed improvement in the measurement of MHL, it exclusively focuses on knowledge of factors that influence mental health/well-being, and not on its definition itself. Indeed, it does not grasp the knowledge of the difference between positive mental health and mental illness nor the dual nature of mental health as integrating mental well-being and the presence or absence of mental illness.

On the other hand, The Attitudes and Knowledge Survey used by Mcluckie et al. (2014), when applied to "The Guide" (e.g., a MHL intervention for school aged children and adolescents), contains two items on the complete mental health definition (e.g., "mental health and mental illness both involve the brain and how it functions"; "people who have mental illness can at the same time have mental health"). However, it does not contemplate factors that specifically protect and promote mental health as a complete state that includes mental well-being. The survey is composed of two sections, the first section has twenty-eight items rated as "True", "False" "Do not know", asking questions about general mental health knowledge. Additionally, the second section contains eight items rated on a Likert rate type scale with seven points, examining attitudes related to mental illnesses. Nonetheless, it does not measure knowledge on the factors that promote complete mental health. Additionally, it was specifically designed to assess the components of the program "The Guide" and is directed to the young population.

The current study aims to develop and explore the factor structure and the psychometric properties of a new instrument that assesses positive mental health and well-being literacy: the Positive Mental Health Literacy Questionnaire (PosMHLit).

2. Method

2.1 Questionnaire development

Item development was based on extensive literature review on MHL, particularly on its operative definition, current measurement and limitations. The core element underlying the need for a new measure of MHL is the realization that the existing measures of MHL are not able to grasp a complete operationalization of mental health, i.e., one that encompass both literacy of mental illness (negative mental health) and of mental health and well-being (positive mental health). We used the Two-Continuum Model of Mental Health and Mental Illness (Keyes, 2002, 2005, 2007, 2010) and related research on developmental psychology, clinical psychology and positive psychology to generate items on 1) positive mental health or mental well-being definition; 2) beliefs about positive mental health and/or mental well-being; 3) factors that protect and promote positive mental health or mental well-being.

From the literature review, three aspects were clear: a) the importance of mental well-being for mental health, b) mental health and mental illness as distinct factors of overall mental health/illness, c) the importance of factors that protect and promote mental well-being. Thirty items were generated according to these three aspects, from which derived six factors initially hypothesized: 1) definition of good mental health and mental well-being, 2) beliefs about good mental health and mental well-being, and four overall protectors/promoters of mental health: 3) gratitude, 4) positive interpersonal relationships, 5) emotion regulation, and 6) valued action.

The 30 items of the scale were organized in a 5-point Likert scale ranging from 1- strongly disagree; 2 – disagree; 3 – neither agree nor disagree; 4 – agree; 5- strongly agree. Items 3, 12 and 17 were reversed.

To address content validity, a focus-group with three clinicians was conducted. Clinicians received an envelope with all items separately and randomly distributed. They were instructed to 1) evaluate its clarity and adequacy, and 2) to group them into one of six envelopes. The envelopes were coded with: "Definition of good mental health"; "Knowledge and beliefs about good mental health"; "Gratitude as protective factor"; "Social relationships as protective factor"; "Values as protective factor"; "Emotion regulation as protective factor". The same procedure was followed with three senior research experts in mental health and mental well-being, who independently examined the items and allocated them into different envelopes (Note: senior researchers proceeded with the task individually, given that it was not possible to conduct a focus-group due to schedule incompatibilities). According to Olson (2010) expert

review should be performed using multiple experts when evaluating questionnaires. See Table 1 for a full depiction of the distribution/grouping of items by the clinicians and the researchers.

Table 1. Conceptual Validation

Items	Clinicians			Researchers		
Initially hypothesized	1	2	3	1	2	3
1 - D	B	D	D	D	B	D
2 - B	B	D	B	B	B	B
3 - B	B	B	B	B	B	D
4 - B	D	V	B	B	ER	B
5 - SR	SR	SR	SR	SR	SR	SR
6 - ER	ER	ER	ER	ER	B	ER
7 - B	D	D	B	B	B	B
8 - B	B	D	B	B	B	B
9 - B	B	V	V	V	ER	B
10 - B	B	D	D	B	B	B
11 - G	G	G	G	G	G	G
12 - ER	ER	ER	ER	ER	ER	ER
13 - B	B	D	G	B	B	V
14 - ER	ER	ER	ER	ER	B	ER
15 - D	B	D	D	D	B	D
16 - D	B	B	D	D	B	B
17 - D	B	B	D	D	B	D
18 - SR	SR	SR	SR	SR	SR	SR
19 - V	V	V	V	V	V	V
20 - ER	ER	ER	ER	ER	ER	ER
21 - SR	SR	SR	SR	SR	SR	SR
22 - B	D	B	B	B	B	D
23 - V	B	V	V	V	B	V
24 - B	D	B	B	B	B	D
25 - B	D	B	V	B	B	B
26 - V	V	ER	V	V	V	V
27 - G	B	G	G	G	G	G
28 - B	B	D	G	B	B	RE
29 - ER	ER	ER	ER	ER	ER	ER
30 - G	B	G	G	G	B	G

Note. D = Definition; B = Beliefs; SR = Social Relationships; ER = Emotion Regulation; G = Gratitude; V = Values.

Concerning the distribution of the items by hypothesized factors, agreement was not met. Data collection was then conducted in order to explore the factor structure and psychometric properties of the scale.

2.2 Participants

The current study was conducted in a community sample of 418 participants collected online or through paper-and-pencil. In order to meet inclusion criteria participants should be older than 18 years old.

The majority of our sample was composed of women (n = 293; 70.1%), and men (n = 123; 29.4%), with one participant identifying as "other" (n = 1; 0.2%). The mean age of our sample was M = 35.59 (SD = 13.75). In terms of marital status, participants were either dating (n = 111; 26.7%), married (n = 143; 34.4%) or in a civil partnership (n = 26; 6.3%), single (n = 114; 27.4%), and some were divorced/separated (n = 16; 3.9%) and widowed (n = 6; 1.4%). The majority of our sample had either completed high-school (n = 107; 25.6%), had a bachelors (n = 145; 34.7%) or a master´s degree (n = 101; 24.2%). Also, our sample was composed of participants with a low (n = 59; 14.1%), medium (n = 153; 36.6%) or high socioeconomic status (n = 54; 12.9%), in addition to some being college students (n = 94; 22.5%), psychologists (n = 29; 6.9%), unemployed (n = 13; 3.1%) or retired (n = 16; 3.8%). Finally, 154 participants had never had counseling nor psychotherapy (70.6%), and 192 had never been to a psychiatrist (88.9%).

2.3 Procedure

This study is part of a larger research project that was approved by the Scientific Committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra. All participants provided informed consent to its participation and received information regarding the confidentiality and anonymity of the data, the voluntary role of the participation, so as the right to withdraw the study.

During September 2018 and July 2019, a sample of 594 young-adults and adults was collected, of which 370 were recruited online, through email and unpaid social media posting and cross-posting. Emails and posts were sent to educational, work and leisure institutions. The online protocol was allocated to an academic server (through LimeSurvey platform), and the study protocol was active from September 2018 to July 2019. From the online sample, only 198 were complete. In order to expand the sample collected online, 250 protocols were given to personal contacts of an independent collaborator (not part of the research team) and also to the clients

of a work institution to which the collaborator had access. During the months of May 2019 and July 2019, 224 questionnaires were collected and 220 were complete.

2.4 Measures

In addition to the newly developed Positive Mental Health Literacy Questionnaire (PosMHLit), and a set of sociodemographic questions, the battery of questionnaires included the following:

2.4.1 Mental Health Literacy Questionnaire (MHLq; Dias et al., 2018). This self-report measure is composed of 29 items ranked in a 5-point Lickert Scale. The scale has a total score and also 4 factors: 1) knowledge of mental health problems; 2) erroneous beliefs/stereotypes; 3) help-seeking and first aid skills; 4) self-help strategies. All subscales presented good internal consistency in the original study, ranging from .72 to .84.

2.4.2 Brief Symptom Inventory (BSI; Derogatis, 1982/1993; portuguese version Canavarro, 1999). BSI is a widely used measure of psychopathological symptoms, composed of 53 items ranked in a 6-point Lickert-like Scale (from 0 = "not at all" to 4 = "extremely"). The scale measures nine dimensions of psychopathology: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism. In the Portuguese version of the instrument (Canavarro, 1999), alpha levels ranged from .62 to .80.

2.4.3 Mental Health Continuum Short-Form (MHC-SF; Keyes, 2005; 2007). MHC-SF measures mental well-being in 14 items ranked from 0-6 (from 0 = never to 6 = everyday). Items are grouped in 3 factors: emotional well-being; psychological well-being and social well-being. Given that the original authors advise for the testing of two versions of item 6 (Keyes, 2009), we have conducted a preliminary exploratory factor analysis of the MHC-SF in the current sample. Results corroborated the 3-factor solution (explaining 67.05% of variance), all items loaded into the expected factor and presented acceptable communalities (from 0.56: item 5; to 0.87: item 6). The MHC-SF is adapted for the adult Portuguese population as a valid and reliable measure (Fonte et al., 2020). The original study of the MHC-SF found good internal consistency of all three subscales >.80 (Keyes, 2005, 2009) and in the Portuguese version for adolescents the emotional well-being scale has .85, the social well-being scale .80 and the psychological well-being scale .83 (Matos et al., 2010).

2.5 Data Analyses

All statistical analyses were conducted using the software SPSS statistics version 23.0 (IBM corp., 2011).

An Exploratory Factor Analysis (EFA) was conducted, using Principal Axis Factoring (PAF) with Direct Oblimin rotation given that the theoretically hypothesized factors underlying the PosMHLit were expected to correlated (Tabachnick & Fidell, 2007). Eigenvalues > 1, as well as the examination of scree-plot points of inflection, guided decisions regarding the number of factors to extract (Johnson, 1998). Additionally, a Parallel Analysis (PA) was conducted to buffer the potential over-extraction from the eigenvalues′ criterion (Hubbard & Allen, 1987; Zwick & Velicer, 1986). A factor extraction is corroborated by the PA when eigenvalues are greater than the respective randomly generated PA eigenvalues (Franklin et al., 1995). The adequacy of data was assessed through the Kaiser Meyer-Olkin (KMO) test. Data is considered adequate when KMO > 0.80 (Kaiser, 1974; Sharma, 1996). The variance of each item accounted for by the factors were examined through extracted communalities, in which values < .30 suggests the item shares little variance with other variables, thus should be eliminated (Field, 2013; Tabachnick & Fidell, 2007).

Cronbach´s alpha was calculated for each subscale in order to assess the reliability of the PosMHLit. Acceptable reliability was considered when $\alpha > .70$ (Field, 2013), and when item-total correlations >.30 (Nunnally & Bernstein, 1994).

Construct validity was assessed by correlating the PosMHLit with related and/or other relevant measures of mental health literacy and mental health, and examining the Pearson´s correlation coefficients (Cohen et al., 2003).

3. Results

3.1 Preliminary Data Analysis

In order to test for normality, we have conducted a Kolmogorov-Smirnov for all 30 items. Results suggested a non-normal distribution ($p < .001$ for all 30 items), with .22 < K-S < .39. However, results from preliminary analyses suggested acceptable values of skewness and kurtosis (SK < |3| and Ku < |8-10|) and VIF <5 (Kline, 2005), which suggest that normality of distribution was not violated, thus data can be treated as normally distributed. Six outliers were identified (for the social phobia factor in BSI). However, we decided to retain these participants following the assumption that the assumption that maintaining outliers allows for data to be more likely representative of the variability of the population under study (Kline, 2005; Tabachnick & Fidell, 2007).

Given that the sample was collected using two different strategies (online: n = 198; paper-and-pencil: n = 220), we conducted difference test analyses to explore differences in

sociodemographic variables between the subsamples. Results from t-test analyses suggest no difference in age between strategies of sample collection [t (416) = 1.90, p = 0.058]. Also, in terms of gender, differences found between samples were barely significant [χ^2 (3) = 7.98, p = 0.046]. There were differences in terms of marital status [χ^2 (6) = 36.91, p < 0.001], level of education (χ^2 (13) = 131.84, p < 0.001), and socioeconomic status (χ^2 (6) = 67.47, p < 0.001). Nonetheless, we decided to combine both samples in order to end up with a more diverse sample, given that research has suggested that online recruitment may lead to potential sampling bias (e.g., younger, higher socioeconomic status) (e.g., Trindade et al., 2019).

3.2 Exploratory factor Analysis (EFA)

An EFA was initially conducted using Principal Axis Factoring (PAF), with Direct Oblimin rotation, and using the Kaiser criterion (eigenvalues > 1) for extracting factors. Results suggested that data were adequate [KMO = 0.941; χ^2 (435) = 4663. 60, p < 0.001], and the eigenvalues suggested the extraction of five factors, explaining a total of 41.94% of variance. Communalities showed that five items did not meet acceptable values (> 0.30): item 10 (0.239), item 16 (0.145), item 17 (0.161), item 21 (0.267), item 26 (0.188). We have excluded these items and reconducted the PAF. Two new more items did not meet acceptable values for communalities – item 7 (0.298) and item 13 (0.297) – and were excluded before reconducting the PAF. Three more items presented unacceptable communalities - item 1 (0.277), item 2 (0.283), and item 12 (0.299) -, thus a new PAF was conducted without these items. Results suggested that the remaining 20 items presented acceptable values for communalities - lowest: 0.335 (item 3); highest: 0.560 (item 22)]. The eigenvalues suggested the extraction of two factors: factor 1 presented an eigenvalue of 8.48 (39.60% of variance) and factor 2 an eigenvalue of 1.37 (4.17% of variance). In order to control for potential over-extraction, a Parallel Analysis (PA) was conducted. Results corroborated the suggested that two factors could be extracted from the analyses: two eigenvalues from the FAP were greater than the corresponding randomly generated matrix in PA (factor 1: 0.46; factor 2: 0.38). In light of these results, a two factor solution was forced, using the same extraction and rotation procedures above described. Results show good adequacy of data [KMO = 0.946; χ^2 (190) = 3548.34, p < 0.001], the two factor solution explains 43.77% of variance, all items present acceptable communalities (> .30), and factor loadings clearly suggest a two-factor solution (seeTable 2)

Table 2. Complete item pool and factor loadings (N = 418)

Items (Portuguese)	Items (English)	Factor Loadings	
3*. A história do desenvolvimento de cada pessoa (os genes que herdou, a família onde nasceu, os acontecimentos de vida) não condiciona a sua saúde mental.	The developmental story of each person (genes, family and life events) doesn´t affect her mental health.	0.105	**0.513**
4. Cada fase do desenvolvimento pode ser uma fonte de aprendizagens sobre o que causa bem-estar e o que causa sofrimento.	Each developmental stage can be a source of learnings about what causes well-being and what causes suffering.	**0.426**	0.265
5. Cultivar relações com pessoas que transmitem apoio, aceitação e respeito pelo outro é benéfico para a saúde mental.	Cultivating relationships with people that transmit support, acceptance and respect is good for mental health.	**0.629**	0.062
6. Ter estratégias para lidar com as emoções é benéfico para a saúde mental.	Having strategies to deal with emotion is good for mental health.	**0.542**	0.169
8. Ao longo da vida é importante obter informação sobre como cuidar da saúde mental.	Across life span it´s important to obtain information about how to take care of mental health.	**0.465**	0.243
9. Para ter boa saúde mental uma pessoa deve cuidar de si e cultivar aquilo que lhe traz bem-estar.	To have good mental health a person must take self-care and cultivate what makes her feel well-being.	**0.584**	0.132
11. Apreciar e agradecer o que se tem de bom, mesmo em momentos difíceis, promove o bem-estar.	Appreciatting and being thankful about the good things one have, even in difficult moments, promotes well-being.	**0.640**	-0.036
14. Lidar com as emoções em vez de fugir destas leva, a longo prazo, a maior bem-estar e menor sofrimento.	Dealing with emoticons in spite of running from it, leads in the long term to higher well-being and less suffering.	**0.543**	0.102
15. A saúde mental é mais do que a ausência de doença mental, implica sentir níveis significativos de bem-estar e ter bom funcionamento.	Mental health is more than the absence of mental illness, it involves feeling significant levels of well-being and having good functioning.	**0.377**	0.302
18. Planear tempo para estar com pessoas com quem se tem interesses em comum é benéfico para a saúde mental.	Planning time to be with people with whom one have common interests is good for mental health.	**0.810**	-0.211
19. Planear tempo para fazer atividades valorizadas promove bem-estar.	Planning time to do valued activities promotes well-being.	**0.752**	-0.174
20. Aprender a reconhecer e gerir as emoções é benéfico para a saúde mental.	Learning to recognize and manage emotions is good for mental health.	**0.598**	0.144
22. A história do desenvolvimento de cada pessoa (os genes que herdou, a família onde nasceu, os acontecimentos de vida) condiciona sua vulnerabilidade para doenças mentais.	The developmental story of each person (genes, family and life events) affects her vulnerability for mental illnesses.	-0.014	**0.756**
23. Reservar tempo para fazer atividades que trazem realização pessoal é benéfico para a saúde mental.	Keeping time to do activities that bring personal fulfillment is good for mental health.	**0.731**	0.004
24. A história de desenvolvimento (os nossos genes, a nossa família, os acontecimentos que não controlámos e que controlámos) condicionam as nossas fontes de bem-estar e influenciam as nossas fontes de sofrimento.	The developmental story (genes, family and events we control and don not control) affect our sources of well-being and affect our sources of suffering.	0.153	**0.533**
25. Para cuidar da saúde mental é fundamental estar-se atento às necessidades e limites pessoais.	To take care of mental health is fundamental to be aware of our needs and boundaries.	**0.506**	0.253
27. Prestar atenção e apreciar as coisas boas que acontecem é benéfico para a saúde mental.	Paying attention and appreciating good things that happen is good for mental health.	**0.715**	-0.041
28. É possível crescer com os momentos de sofrimento na vida.	It´s possible to evolve with moments of suffering in life.	**0.443**	0.204
29. Reconhecer, permitir e regular os estados emocionais é benéfico para a saúde mental.	Recognizing, allowing and regulating emotional states is good for mental health.	**0.608**	0.192
30. Reconhecer e reflectir sobre o que se tem de bom potencia o bem-estar.	Recognizing and reflecting about the good one has promotes well-being.	**0.702**	-0.051

Note. Item 3 is reversed.

The 20 items that compose the final version: items 4,5,6,8,9,11,14,15,18,19,20,23,25,27,28,29,30 (literacy on *characteristics and promoters of mental health and well-being*); items 3, 22, 24 (literacy on *vulnerability factors of mental health and well-being*).

The examination of the pattern of items that compose each factor suggested that the two-factor solution reflects two constructs of Positive Mental Health Literacy: factor 1 "characteristics and promoters of positive mental health" (items 4,5,6,9,11,14,15,18,19,20,23,25,27,28,29,30) and factor 2 "vulnerability factors of positive mental health" (items 3, 22, 24).

Given that the factor loadings show an unbalanced distribution of items, with factor 1 composed of 17 items, and factor 2 composed of 3 items, we have decided to force a one-factor solution. Results show that, in a one-factor solution, the three items that previously composed factor 2 do not attain acceptable values of communalities: item 3 (0.216), item 22 (0.261), item 24 (0.276). Thus, to calculate the total score of the scale, as unidimensional instrument, the 17 items of factor 1 should be used.

3.3 Internal consistency

Cronbach´s alphas were calculated in order to assess reliability. Results suggested both scales presented good internal consistency (see Table 3).

Table 3. Means (*M*), Standard Deviations (*SD*), Corrected item-total correlation (*r*), Cronbach´s alpha (α) if item deleted and Cronbach´s alpha (α) of each subscale (N = 418)

	M	*SD*	Corrected item-total *r*	α if item deleted	α
Characteristics and promoters of mental health and well-being					**0.92**
Item 4	4.18	0.53	0.58	0.92	
Item 5	4.49	0.57	0.63	0.91	
Item 6	4.37	0.60	0.63	0.91	
Item 9	4.42	0.56	0.64	0.91	
Item 11	4.26	0.61	0.59	0.92	
Item 14	4.20	0.70	0.58	0.92	
Item 15	4.11	0.71	0.55	0.92	
Item 18	4.27	0.56	0.63	0.91	
Item 19	4.30	0.57	0.60	0.92	
Item 20	4.41	0.56	0.65	0.91	
Item 23	4.42	0.53	0.69	0.91	
Item 25	4.18	0.61	0.64	0.91	
Item 27	4.28	0.54	0.65	0.91	
Item 28	4.30	0.62	0.54	0.92	
Item 29	4.27	0.57	0.70	0.91	
Item 30	4.31	0.60	0.64	0.91	
Vulnerability factors of mental health and well-being					**0.70**
Item 3r	3.89	0.99	0.48	0.71	
Item 22	3.99	0.77	0.60	0.51	
Item 24	3.96	0.70	0.52	0.62	

The subscale "*characteristics and promoters of positive mental health*" presented an $\alpha = 0.92$, and the subscale "*vulnerability factors of positive mental health*" had an acceptable $\alpha = 0.70$. Also, results from corrected item-total correlations show that all items present an item-total correlation > 0.30, and that all items were contributing to the internal consistency as evidenced by Chronbach´s alpha if item deleted.

3.4 Construct validity

Both subscales from the PosMHLit were significantly correlated with closely related constructs, such as mental health and mental health literacy. See Table 4 for a full depiction of the intercorrelations between all variables in the study.

Table 4. Mean, Standard Deviation and Cronbach alpha of all variables, and Pearson´s intercorrelations between all variables in study (N = 418)

M	SD	α	1	2	3	4	5	6	7	8	9	10
68.78	6.36	0.92	-	-	-	-	-	-	-	-	-	-
11.84	1.97	0.70	0.56***	-	-	-	-	-	-	-	-	-
45.32	4.56	0.79	0.67***	0.46***	-	-	-	-	-	-	-	-
32.26	2.94	0.52	0.48***	0.52***	0.45***	-	-	-	-	-	-	-
23.57	3.56	0.69	0.40***	0.27***	0.35***	0.22***	-	-	-	-	-	-
17.59	1.77	0.62	0.55***	0.26***	0.50***	0.27***	0.29***	-	-	-	-	-
0.44	0.55	0.84	-0.05	0.06	0.01	-0.03	0.02	-0.09	-	-	-	-
1.04	0.73	0.84	-0.06	0.10*	-0.01	-0.00	-0.01	-0.07	0.60***	-	-	-
0.69	0.77	0.84	-0.03	0.08	-0.00	-0.02	0.01	-0.03	0.60***	0.74***	-	-
0.74	0.78	0.89	-0.03	0.12*	0.03	0.04	-0.01	-0.04	0.66***	0.77***	0.80***	-
0.75	0.69	0.86	0.03	0.17***	0.10	0.10*	0.07	-0.06	0.76***	0.71***	0.71***	0.77***
0.73	0.63	0.81	-0.12*	0.00	-0.02	-0.07	0.01	-0.09	0.56***	0.63***	0.63***	0.67***
0.33	0.57	0.83	-0.04	0.11*	0.02	0.02	0.03	-0.10*	0.64***	0.62***	0.62***	0.69***
0.85	0.72	0.79	-0.06	-0.01	-0.00	-0.07	0.04	-0.06	0.58***	0.65***	0.65***	0.71***
0.53	0.66	0.80	-0.02	0.11*	0.02	0.02	0.01	-0.04	0.59***	0.77***	0.77***	0.86***
10.86	3.00	0.88	0.08	-0.13*	-0.00	-0.00	0.10*	0.08	-0.34***	-0.44***	-0.41***	-0.59***
10.93	5.62	0.82	0.19***	0.02	0.09	0.00	0.14**	0.14*	-0.29***	-0.35***	-0.29***	-0.40***
19.70	6.53	0.88	0.20***	-0.07	0.12**	0.06	0.13**	0.17**	-0.27***	-0.51***	-0.42***	-0.48***

Note. * p < 0.05, ** p < 0.01, *** p< 0.001

PosMHLit -CP = Positive Mental Health Literacy Questionnaire – Characteristics and Promoters; PosMHLit -V = Positive Mental Health Literacy Questionnaire – Vulnerability; MHLq = Mental Health Literacy questionnaire (K = Knowledge of mental health problems; EB = Erroneous beliefs/stereotypes; SHSB = First aid skills and help seeking behavior; SHS = Self-help strategies); BSI = Brief Symptom Inventory (S = somatization; OC = Obsession-Compulsion; IS = Interpersonal Sensitivity; DEP = Depression; ANX = Anxiety; H = Hostility; PA = Phobic Anxiety; PI = Paranoid Ideation; P = Psychoticism); MHC-SF = Mental Health Continum – Short Form (Em = Emotional well-being; So = Social well-being; Psy = Psychological well-being).

Results showed that both subscales of the PosMHLit were positive and significantly correlated with each other. Also, both subscales of the PosMHLit were found positive and significantly associated with the four subscales of the MHLq, where the magnitude of these association were stronger for "*characteristics and promoters of positive mental health*" subscale of the PosMHLit. Interestingly, a pattern of non-significant associations were found between both subscales of the PosMHLit and all subscales of the BSI, with the exception of a negative and significant association between "*characteristics and promoters of positive mental health*" and hostility, and between "*vulnerability factors of positive mental health*" and obsessive-compulsive, depression, anxiety, phobic anxiety and psychoticism, all of which with a rather small magnitude of correlation (from $r = 0.10$ to $r = 0.17$). Finally, the "*characteristics and promoters of positive mental health*" subscale of the PosMHLit was positive and significantly correlated with the subscales of social and psychological well-being of the MHC-SF (but not with the emotional well-being), whereas the "*vulnerability factors of positive mental health*" subscale were negatively and significantly associated with emotional well-being (but not with social and psychological well-being).

4. Discussion

Recent studies on MHL have established the importance of measuring how to obtain and maintain good mental health (BjØrnsen et al., 2017; Kucther et al., 2016a), as well as the utility of measuring the acknowledgement that good mental health/well-being is possible even if experiencing mental illness (Mcluckie et al., 2014). Nonetheless, existing instruments of positive MHL are not intended for the adult general population and/or do not target a) the knowledge about the definition of good mental health and of b) its protective or promoting factors. The current study aimed to develop a new measure of MHL that assesses the knowledge on both the definition and the factors that promote positive mental health/well-being. The PosMHLit is a new tool for mental health research that measures knowledge on good mental health, on the difference between mental illness and mental health/wellbeing, and on how to obtain and maintain good mental health and well-being.

Results from the EFA suggested a two-factor solution, with factor 1 (*"characteristics and promoters of positive mental health"*) composed of 17 items and factor 2 (*"vulnerability factors of positive mental health"*) encompass 3 items. This structure appears to reflect the existing literature that asserts that good mental health can be defined and its promoters can be identified (e.g. BjØrnsen et al., 2017, 2019; Bolier et al., 2013; Lyubomirsky & Layous, 2014; Schotanus-Dijkstra et al., 2015), and that good mental health can also be impacted by risk factors, namely by genetic,

environmental and developmental factors (Røysamb et al., 2018) . It is important to note that when a one-dimensional solution was forced, the items of factor 2 did not meet an acceptable solution. Therefore, if a one-factor solution is followed (in order to attain an overall global measure of positive mental health literacy), items 3, 22 and 24 should be excluded from analyses. The factorial structure of this questionnaire suggests that conceptually the mental health definition and its promoters are separate from the causes that put mental health at risk, representing the idea that absence of risk does not equal the presence of promotion. Future studies may replicate the factorial structure of PosMHLit using other samples.

The PosMHLit presents adequate reliability, and factor *"characteristics and promoters of positive mental health"* had higher internal consistency than *"vulnerability factors of positive mental health"*. This result can be influenced by the fact that *"vulnerability factors of positive mental health"* is composed of only three items. The questionnaire was significantly correlated with other relevant instruments, such as MHL assessed by the MHLq. Similarly to the results found in the dual model of mental health/ illness, the constructs assessed by PosMHLit and MHLq, are correlated but do not overlap. This not only assures content validity, but also supports the dual model of mental health and the assertion that MHL as a theory derives related yet different constructs such as literacy about mental illness and positive mental health literacy (Spiker & Hammer, 2019). In this sense, positive MHL and literacy about mental illness must be evaluated differently.

Mental illness and mental well-being symptoms were also assessed. In previous studies, mental health literacy was associated with psychopathology symptoms (Brijnath et al., 2016; Lam, 2014). In the current study, only "*characteristics and promoters of positive mental health*" was related to hostility, while "*vulnerability factors of positive mental health*" was correlated to obsessive-compulsive, depression, anxiety, phobic anxiety and psychoticism. Nonetheless, these associations were weak. One possible explanation for this is that our sample might be a particularly healthy sample, thus the recognition of the vulnerability factors for developing mental health may not be significant related with experiencing symptoms of mental illness. Indeed, the levels of psychopathological symptoms of our sample are below those reported by the original study (Canavarro, 1999). Future studies should explore the nature of the relationship between literacy about positive mental health and psychopathology in both general and clinical samples.

As previous research suggested (BjØrnsen et al., 2019), positive mental health literacy is related to positive mental health. It is interesting to note that the patterns of relationships with the subscales: the *"characteristics and promoters of positive mental health"* is positively associated with psychological and social well-being scales, that are more connected with positive functioning, while *"vulnerability factors of positive mental health"* is negatively related to emotional well-being. Due

to the correlational nature of the results one must not infer causality, but one may hypothesize that this negative relationship is operated by other psychological processes: for example, it may be the case that acknowledging risk factors (e.g., the existence of genetic vulnerability factors) may be accompanied by potentially nefarious processes, such as worry, rumination and catastrophizing, which are associated to less emotional well-being. Future studies should examine more thoroughly these relationships, in order to more accurately establish whether those who feel better are less informed or do not feel the need to get information about positive mental health.

The current study presents several limitations. Therefore, caution should be taken while interpreting the results. Firstly, this study was conducted using self-report measures. Future studies should use independent evaluators to address self-reporting bias. One should also note that one of the measures used for content validation (the MHLq) presented low levels of internal consistency in one of the main variables – MHL (e.g., measured as mental illness literacy). Further studies should cross the PosMHLit with other mental health literacy instruments and assessment tools that measure knowledge about mental illness. The temporal stability of the measure should also be controlled in future studies as this study did not assess the stability and sensitivity of the instrument across time. In terms of sample composition, limitations also arise from the fact that we have an imbalance between sub-samples in education, gender and occupation. Future studies should replicate this study with larger and more homogenous sub-samples. Also, as this study was conducted in a community sample, these results cannot be extrapolated to clinical samples with poor mental health and high levels of psychopathological symptoms. Future studies should replicate this study in clinical samples and/or samples with high risk of developing mental illness.

Nonetheless, the current study present contributes to MHL research and assessment, and presents the strength of a combined strategy in instrument development (e.g. conceptual validation with and expert panel, and empirical validation in a sample of general adult population). Conceptual validation used multiple experts from both clinical and research contexts (Olson, 2010). Empirical validation followed recent methodological guidelines in MHL research (Mansfield et al., 2019; Spiker & Hammer, 2019; Wei et al., 2016) and used a protocol of valid and reliable questionnaires.

5. Conclusion

Combining the measurement of positive mental health literacy with the measurement of mental illness literacy allows better designs for research purposes and also for the implementation of

mental health programs. Separating literacy about mental health and mental illness has the advantage of studying their distinct impact on well-being and psychopathology, stigma and help-seeking. Also, programs can address separately or in an integrated field mental well-being and mental illness as themes for prevention, management and empowerment in complete mental health, thus assessing more accurately the result of training a dual MHL program.

For the general population, this instrument may track individuals that neglect their mental well-being and positive mental health as an important part of their overall mental health, thus potentially helping them ask for help, even if they do not currently experience symptoms of mental illness (Martino et al., 2021).

For mental health professionals, teachers and work psychologists, this instrument may work as a useful screening tool to identify those who would benefit from mental health literacy interventions or programs focusing on mental well-being (Carrozzino et al., 2019; Marchetti et al., 2018). By using the PosMHLit with a measure of positive mental health, like the MHC-SF (Keyes, 2005), professionals can also identify those who could improve their mental health through mental health programs designed to promote positive mental health. For instance, in work-related environments, literacy about positive mental health presents particularly promising potential as positive mental health is related to absenteeism (Keyes & Grzywack, 2005). Also, for those recovering from mental illness, literacy about positive mental health may facilitate recovery management, as mental well-being is associated with recovery and relapse prevention (Schotanus-Dijkstra et al., 2017; Wood & Joseph, 2010).

Instead of equipping subjects with literacy about mental illness, future programs can address literacy about complete mental health, where both mental illness and mental well-being deserve attention. The PosMHLit is a valid and reliable scale that captures knowledge about positive mental health and well-being. This instrument can be used to support research and interventions tailored in the field of MHL, nevertheless future studies should further replicate the study of the psychometric properties of this instrument.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement *: The data generated are available from the corresponding author on reasonable request.

Conflict of interest statement *: There is no conflict of interest that authors are aware.

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