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Use of the “Mental Health Inventory – 5” with Portuguese 10-15 Years Old

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The present study describes the psychometric properties of the Portuguese version of the Mental Health Inventory-5 for use with young adolescents. A sample of 367 Portuguese students (aged 10-15 years) completed the Portuguese-language versions of Mental Health Inventory-5 (MHI-5; Berwick et al., 1991), Children’s Hope Scale (CHS; Snyder et al., 1997), Students’ Life Satisfaction Scale (SLSS; Huebner, 1991a), and Global Self-Worth Sub-scale (Harter, 1985). Analysis of readability, reliability (internal consistency and 1-year stability), factor structure, and criterion-related validity suggested that the MHI-5 can be appropriately used in this age group. Implications of the findings are discussed.

Keywords: early-adolescents, Mental Health Inventory-5, metric properties, positive constructs.

El presente estudio describe las propiedades psicométricas de la versión en portugués del Mental Health Inventory-5 para su uso con los jóvenes adolescentes. Una muestra de 367 estudiantes portugueses (10-15 años de edad) completaron la versión en portugués del Mental Health Inventory-5 (MHI-5; Berwick et al., 1991), Children’s Hope Scale (CHS; Snyder et al., 1997), Students’ Life Satisfaction Scale (SLSS; Huebner, 1991a), y Global Self-Worth Sub-scale (Harter, 1985). Análisis de la comprensión de la lectura, de la fiabilidad (consistencia interna y 1 año de estabilidad), de la estructura factorial y de la validez relacionada con el criterio sugiere que el MHI-5 puede ser utilizado con este grupo de edad. Se analizan las implicaciones de los resultados.

Palabras clave: jóvenes adolescentes, Inventario de salud mental; propiedades métricas, variables positivas.

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The evolution of the mental health conceptualization includes indicators that measure beyond a negative point to desirable levels of functioning and examine mental health in terms of traditional indicators of psychopathology (e.g., symptoms of anxiety and depression) as well as the presence of indicators of psychological well-being (e.g., feeling cheerful, interest in and enjoyment of life) (Ware, Snow, Kosinski, & Gandek, 1993). Psychological well-being items have the potential to expanding the scope of and improving the precision of mental health measurement by distinguishing among persons who are highly distressed (Veit & Ware, 1983).

Adolescence is a developmental period when individuals may be particularly vulnerable to the negative effects of stress and depressive symptoms (e.g. developmental challenges inherent to adolescence, such as puberty, school transitions and academic demands) (Hankin & Abramson, 2001; McNamara, 2000). Research on mental health indicators such as stress have been linked with aggression (Jaser et al., 2005), academic underachievement (Alva & de Los Reyes, 1999; Cunningham, Hurley, Foney, & Hayes, 2002), depression (Martin, Kazarian, & Breiter, 1995) and substance abuse (Chassin, Ritter, Trim, & King, 2003). Students lower on neuroticism & Sanderman, 2003). In regard to social-demographic characteristics, several studies (e.g. Loge & Kaasa, 1998; Strand, Dalgard, Tambs, & Rognerud, 2003; Sullivan & Karlsson, 1998) reported poorer subjective mental health status among women, among the unemployed, among the low educated and among the single/not married or not living in partnerships/cohabitants.

There are few standardized instruments available for assessing the mental health of adolescents who do not manifest psychiatric symptoms and until the mid1990s research on scales measuring positive indicators of adolescent mental health was limited. One well validated scale now available is the Mental Health Inventory (MHI), a 38-item measure of psychological distress and well-being, developed for use in general populations (Veit & Ware, 1983). A shorter, five item version of the Mental Health Inventory (MHI-5) has also been developed and is based upon items that best reproduce the total score of the MHI (Berwick et al., 1991). The MHI-5 behaves similarly to the longer version with the advantage of permitting earlier assessment (Berwick et al., 1991). In contrast to other measures of mental health, MHI-5 performs remarkably well against the longer Mental Health Component Summary (MCS; Ware, Kosinski, & Dewey, 2000) (Kelly, Dunstan, Lloyd, & Fone, 2008), and behaves similarly to the General Health Questionnaire (GHQ-12; Goldberg & Williams, 1988) with the benefit of the MHI-5 can be used in surveys of general health and quality of life (Hoeymans, Garssen, Westert, & Verhaak, 2004). This last operational advantage of the MHI-5 is also reported in the study of Strand et al., (2003) in comparison with the Hopkins Symptom Checklist (SCL-25, SCL-10, SCL-5 versions; Derogatis, 1983).

The MHI-5 has the distinct advantage of assessing both psychological well-being and symptoms of psychological distress, which makes it suitable for use with non-psychiatric populations. In addition, because the MHI-5 was developed on the basis of information from the general population rather than psychiatric patients, it is considered a suitable community population measure, and could for example be used with school students. Moreover, the MHI-5 seems to be sufficiently brief, psychometrically sound, easy to complete, valid and reliable scores in different subgroups and across various cultures including United States (Ware et al., 1993), Norway (Strand et al., 2003), Denmark (Bültmann et al., 2006), Portugal (Pais-Ribeiro, 2001), Sweden (Sullivan & Karlsson, 1998) and various other European countries (see the European Values Survey, e.g. Bray & Gunnell, 2006).

Currently there are no published studies, of which we are aware, studying the psychometric properties and normative data of MHI-5 in an adolescent sample of youth. A review of the literature shows that MHI-5 has been used with subjects over 15 years (e.g. Bray & Gunnell, 2006) although MHI has been used with subjects over 13 years (e.g. Veit & Ware, 1983). Additionally, a study by Ostroff, Woolverton, Berry, and Lesko (1996) recommended MHI for the assessment of adolescents’ mental health. The authors (Ostroff et al., 1996) analyzed the readability level of the MHI and established a 3rd grade reading level to comprehend the MHI English language version while key words require 4th to 6th grade levels.

In the present study, we examine the psychometric properties and potential utility of the MHI-5 in the assessment of 10- to 15-year-old Portuguese students.
Method

Participants

At Time 1 (Fall 2006), the MHI-5 was administered to 367 students in grades 6 and 8. The sample mean age was 11.78 years (SD = 1.22), range 10-15 years and 53.1% female. The mean age for males was 11.87 years (SD = 1.27) and females was 11.70 years (SD = 1.16). Participants were from seven schools in the north of Portugal. At Time 2 (Fall 2007), 215 of the 367 students completed the MHI-5, yielding a return sample of 68%. Of the students who did not participate at Time 2, 40.8% were part of a larger study (Marques, Lopez, & Pais-Ribeiro, 2011), 53.2% had moved/withdrawn and the remaining 5.93% of students were absent on data collection dates. The mean age of the 215 participants retained for longitudinal analysis was 12.57 years (SD = 1.16), range 11-16 years and 53% were female. Chi-square test and t-tests between students who completed both assessments (Times 1 and 2) and those students lost to attrition were conducted to test the potential effects of sample attrition. The chi-square test comparing the number of participant’s males and females at Time 1 to those at Time 2 was not significant. Comparisons of mean scores on the variables of mental health, hope, life satisfaction and self-worth between students who participated in Time 2 data collection and those students lost to attrition indicated no significant differences between the two groups.

Measures

The study used translated and validated measures of additional constructs (i.e., hope, satisfaction with life and self-worth) linked to children’ well-being (Huebner, 2004; Riesen & Porath, 2004; Snyder, Feldman, Taylor, Schroeder, & Adams, 2000) and generally regarded as key protective factors in early-adolescent psychological development (e.g. Snyder et al., 2000; Suldo & Huebner 2004).

Mental Health Inventory – 5

MHI-5 is a short version of the Mental Health Inventory with 38 items developed in 1975 for the Rand Health Insurance Experiment and it is included in both versions of the Medical Outcome Study (MOS) questionnaires: MOS Short Form 20 (SF-20; Stewart, Hays, & Ware, 1988) and MOS Short Form 36 (SF-36; Ware & Sherbourne, 1992). In addition, MHI-5 is one of the eight dimensions (designated as “mental health”) of the SF-36 (Short Form-36 Health Survey) questionnaire (Ware et al., 1993). The MHI-5 was developed for use in the general population and designed to improve upon other instruments by including items that assessed psychological well-being (Veit & Ware, 1983). This inventory comprises five questions about mood over the past month, measuring the experience of psychological well-being and the absence of psychological distress (see Table 1). Each of the items requires a response on a 6-point rating scale, with possible scores range from 6 to 30, and the instrument is scored such that higher scores indicate better mental health. Internal consistency reliability coefficients range from .80 to .96 across several studies (Ware, Kosinski, & Keller 1994). The MHI-5 was validated by Pais-Ribeiro (2001) for the Portuguese adult population and reported a Cronbach’s alpha of .87.

Children’s Hope Scale (CHS)

The CHS is a dispositional scale developed by Snyder et al. (1997) to measure goal-related hopeful thinking in children and adolescents aged 8 to 16. This self-report measure contains three questions to evaluate pathways thinking and three questions to examine agency thinking on a 6-point scale. The pathways and agency items are alternated within the scale. Possible scores range from 6 to 36, with higher scores denoting higher levels of hope. Previous studies with the CHS revealed adequate psychometric properties, including internal consistencies ranging between .72 and .86 for the total score (see Snyder et al., 2003 for a review). The CHS has been validated for Portuguese children (Marques, Pais-Ribeiro, & Lopez, 2009) and reported a Cronbach’s alpha of .81 for the total score.

Students’ Life Satisfaction Scale (SLSS)

The SLSS (Huebner, 1991) is a self-report measure to evaluate the satisfaction with life as a whole in individuals ranging in age from 8-18 years. Respondents are asked to answer the questions based on the thoughts that had in the last few weeks. For each of the 7 items of the scale, presented as an affirmation, there are six response choices. The scale scores range from 7 to 42, with higher scores denoting higher levels of global satisfaction with life. The internal consistency of the SLSS has been reported as .82 (Huebner, 1991) and .86 in a subsequent exploratory study (Dew & Huebner, 1994). The SLSS has been validated for Portuguese children (Marques, Pais-Ribeiro, & Lopez, 2007a) and reported a Cronbach’s alpha of .89.

Global Self-Worth Sub-Scale (SWS)

The SWS (Harter, 1985) is a self-report measure focused on children’s (8 to 16 years old) domain-specific judgments of their competence, as well as a global perception of self-worth. The SWS taps the extent to which the child likes themselves as a person, and constitutes a global judgment of personal worth. The
general procedures are to score each of the 6 items on a 4-point scale, with a score of 4 reflecting high self-worth and a score of 1 designating low self-worth. Earlier data from Harter (1985) indicates acceptable internal consistency ranging from .78 to .84 for this sub-scale. The Self Perception Profile for Children, including the SWS, has been validated for Portuguese children (Alves-Martins, Peixoto, Mata, & Monteiro, 1995; Faria & Fontaine, 1995) with a reported Cronbach’s alpha of .62 and .73. A recent study with 10-15 year olds reported a Cronbach’s alpha of .80 (Gaspar, Ribeiro, Matos, Leal, & Ferreira, in press), similar to the original version.

Procedure

Approval to collect data was secured through the administrator from each school. A letter describing the study and requesting permission for student participation was sent home to parents of potential participants. Approximately 31% of the students returned signed parental permissions forms. Participant consent was then sought and where provided participants were administered each of the measures described above in groups of 15 to 30 students. The size of the group was dependent upon the space available within each school, as well as the amount of adult assistance available to promote the full understanding of instructions and the confidential completion of all measures. The measures completed by all participants were presented in a counterbalanced order. The students were first asked to complete the demographic survey and then the psychological scales. They were then thanked for their participation and dismissed. Research assistants were available during all administration sessions to answer questions and ensure confidentiality. At time 2, student consent was re-obtained from all participants and survey administration procedures were the same described at time 1.

Statistical Analysis

Readability, internal consistency, intra-class correlation coefficient, stability and descriptive statistics were investigated. Next, we performed exploratory factor analysis using a principal components procedure. The criterion-related validity was investigated through an examination of the relationships between MHI-5 and the CHS, MHI-5 and the SLSS, and between MHI-5 and SWS at Time 1. Time 2 data collection was part of a larger study (Marques, Lopez, & Pais-Ribeiro, in press; Marques, Pais-Ribeiro, & Lopez, 2011).

To assess the readability of MHI-5 in this age group, a pilot study was conducted with 42 individuals, 6-8 grade students with a mean age 12.9 years, range 10-16 years and 61.9% female (Marques, Pais-Ribeiro, & Lopez, 2007b). These 42 students were not incorporated into the sample of the present study. Participants were told ‘If you don’t understand an item, leave it blank. If there are words that you don’t understand, circle them,’ and an example of a circled word was provided. Participants left no items blank and appeared to understand key words (e.g., calm, peaceful, nervous) and so the readability was considered acceptable.

Results

Reliability and descriptive statistics

A Cronbach alpha of .82 was found with item-scale (corrected) correlations ranging from .78 and .81. The intra-class correlation coefficient was .82 and the 1-year test-retest reliability coefficient for the MHI-5 was .49.

The total scale has a $M = 23.86$ and a $SD = 3.84$. When the mean item scores were translated to students’ response they equated to students feeling “a good bit of the time” calm and peaceful, and happy “most of the time”; Students’ felt nervous, upset and depressed “a little of the time”. These results are presented in Table 1.

Relationships between MHI-5 scores and demographic variables (gender, age) were considered. Main effects for gender was found $t(365) = 2.40, p = .02$, with males manifesting a better mental health ($M = 24.30$) than females ($M = 23.40$). The MHI-5 correlation with age was no significant.

Factorial Validity

We performed exploratory factor analysis to identify the factor structure and the magnitude of the factorial loading, replicating the analysis, principal component analysis with a varimax rotation method, that Ostroff and colleagues (1996) used in their study of MHI with adolescents. The Kaiser test (i.e., eigenvalues > 1.0) was used to determine the number of factors to be extracted. We found a one component solution explaining 59.88% of total variance. Additionally, an analysis of the scree plot suggested that factors extracted beyond the first (Eigen value = 2.99) did not account for much additional variance (eigenvalues = .87, .52, .34, and .20, respectively, for the second, third, fourth and fifth factors). Table 1 shows the factorial loadings of the items.

All items loaded substantially on this general component of mental health (range = .70-.81) indicating that this component accounted for a substantial proportion of the variance in each item. Thus, the one-component solution appears to be a viable one among young adolescents. The communality estimate for each item varies between .60 and .73.
Criterion-related Validity of the SLSS

Criterion-related validity of the MHI-5 was assessed through analysis of correlations with other measures, including measures of hope (CHS), satisfaction with life (SLSS) and global self-worth (SWS). Table 2 shows these correlations. MHI-5 scores were found to have a moderate to strong, significant relationship to all the scales.

Discussion

This study provides the first data on the use of the MHI-5 in a sample of 10-15 years old and supported the reliability and validity of the MHI-5 in this population. In particular, the students could read and understand the items, the scale showed adequate internal consistency for research purpose (Nunnaly, 1978) and replicated the adult factor structure, and evidence of criterion-related validity was promising. These results indicate that research on young adolescents using a brief adult mental health inventory is practicable and likely to be informative. The results also imply that adult concepts of mental health and functioning are appropriate for 10-15 year olds.

Specifically, the Portuguese language version of MHI-5 shows acceptable readability for middle-school aged children, which is consistent with the study of Ostroff et al. (1996). In accord with last authors (Ostroff et al.), third grade reading level is required to comprehend the MHI English language version and key words require 4th to 6th grade levels.

The scale internal reliability for this study (\( \alpha = .82 \)) was similar to that of a range of other studies across cultures (\( \alpha = .74 - .87 \)) including a Portuguese language version sample of adults (Pais-Ribeiro, 2001), an English language version samples of adults (e.g. McCabe, Thomas, Bzazuer, & Coleman, 1996; McHorney & Ware, 1995; Rumpf, Meyer, Hapke, & John, 2001), a Norwegian language version (Loge & Kaasa, 1998; Strand et al., 2003), and a Swedish study using the MHI-5 with general adult population (Sullivan & Karlsson, 1998). Test-retest reliability of .49

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### Table 1

Means, Standard Deviations and Principal component analysis with a varimax rotation method and a one-factor solution, with the factorial loading in bold (N = 367)

<table>
<thead>
<tr>
<th>Scale – Items</th>
<th>M</th>
<th>SD</th>
<th>Factorial Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Quanto tempo, durante o mês passado, te sentiste muito nervoso?* (How much of the time, during the last month, have you been a very nervous person?)</td>
<td>4.58</td>
<td>.90</td>
<td>.70</td>
</tr>
<tr>
<td>2 - Quanto tempo, durante o mês passado, te sentiste calmo e em paz? (How much of the time, during the last month, have you felt calm and peaceful?)</td>
<td>4.39</td>
<td>1.05</td>
<td>.75</td>
</tr>
<tr>
<td>3 - Quanto tempo, durante o mês passado, te sentiste triste e em baixo?* (How much of the time, during the last month, have you felt downhearted and blue?)</td>
<td>4.78</td>
<td>1.00</td>
<td>.81</td>
</tr>
<tr>
<td>4 - Quanto tempo, durante o mês passado, te sentiste uma pessoa feliz? (How much of the time, during the last month, have you been a happy person?)</td>
<td>5.39</td>
<td>.82</td>
<td>.79</td>
</tr>
<tr>
<td>5 - Quanto tempo, durante o mês passado, te sentiste triste e em baixo, de tal modo que nada te conseguia animar?* (How much of the time, during the last month, have you felt so down in the dumps that nothing could cheer you up?)</td>
<td>4.75</td>
<td>1.16</td>
<td>.79</td>
</tr>
</tbody>
</table>

* Items are reverse-scored

### Table 2

Correlations between Portuguese Versions of the Mental Health Inventory-5, Children Hope Scale, Students Life Satisfaction Scale and Self-Worth Sub-Scale (N = 367)

<table>
<thead>
<tr>
<th>1. Mental Health Inventory-5</th>
<th>2. Children’s Hope Scale</th>
<th>3. Students’ Life Satisfaction Scale</th>
<th>4. Self-worth Sub-scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mental Health Inventory-5</td>
<td>---</td>
<td>.45**</td>
<td>---</td>
</tr>
<tr>
<td>2. Children’s Hope Scale</td>
<td>.45**</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3. Students’ Life Satisfaction Scale</td>
<td>.56**</td>
<td>.63**</td>
<td>---</td>
</tr>
<tr>
<td>4. Self-worth Sub-scale</td>
<td>.41**</td>
<td>.60**</td>
<td>.61**</td>
</tr>
</tbody>
</table>

**p < .01
over a 1-year interval indicates that a substantial proportion of the reliable variance is moderately stable.

Exploratory factor analysis procedures supported the notion of a single underlying mental health component, at the same time, it calls attention to the fact that a approximately 40% of the variance was unexplained by the unidimensional model. Additionally, the communality estimate for each item is appropriate (Thompson, 2004).

Criterion-related validity was considered by examining its relationships to several different, but related measures. MHI-5 scores were correlated positively with scores on measures of hope, global life satisfaction and self-worth. The moderate to strong relationship between mental health and the three variables of life satisfaction, hope and self-worth are consistent with other research in U.S. populations (Huebner, Funk, & Gilman, 2000; Shorey, Snyder, Yang, & Lewin, 2003, Spencer, Josephs, & Steele, 1993). These findings indicate that MHI-5 shares a significant amount of variance with positive thinking variables, providing additional support for the criterion-related validity of the MHI-5 for young adolescents. Significant associations were found between MHI-5 and gender, with males reporting better mental health than females, and 10-15 year olds reporting better mental health compared to adults mean scores ($M = 19.83$, Pais-Ribeiro, 2001). These age and gender findings are consistent with Ostroff et al., (1996) study using the MHI in an adolescent population.

At present, the MHI-5 can be considered a promising tool for mental health assessment in children as young as age 10. It is therefore a candidate for use in studies of children on a wide range of topics. In adults, mental health assessment is often used clinically to aid in diagnosis. For example, Means-Christensen, Arnau, Tonidandel, Bramson, & Meagher (2005) established the utility of the MHI-5 for the detection of patients suffering from major depression or panic disorder in primary care settings. A study of HIV positive outpatients found that MHI-5 may be a useful case-finding measure for these patients, namely to indicate a diagnosis of recent major depression (Holmes, 1998). But clinical applications may be of limited interest to those psychologists who are predominantly concerned with developmental processes that lead to a positive development or to problems in adjustment and to understand the client more fully. For them, studies of the interactions of mental health and positive traits may be more relevant. For example, Shorey et al., (2003) assessed the role of hope as a mediator in recollected parenting, adult attachment, and mental health.

The current study has a number of limitations which need to be considered. First, the sample was not nationally representative, and, therefore, generalizing results from this study alone must be done with caution. Additional samples are necessary to determine the generalizability of the findings, and larger samples are necessary to determine specific response patterns within each group (e.g.. gender differences). A second limitation is that the data collected were self-report items. The reliability of self-report data has been questioned repeatedly in the literature and it is known that multitemethod studies would enhance the meaningfulness of the findings (Diener, 1994). However, self-report is the usual method of gathering information about personal perceptions. According to Lazarus and Folkman’s (1984) theory, perceptions largely determine what is and is not stressful to the individual. Nevertheless, it is possible that shared method variance may have inflated the observed relationships among variables. Finally, the MHI-5 represents a brief screener of mental-health. However past research (e.g. Strand et al., 2003) indicates that MHI-5 behave similarly as MHI, SCL-25, GHQ-12, or MCS. Moreover MHI-5 is widely used not only in psychiatric surveys but also in surveys of general health, an operational advantage comparing to other short form scales (e.g. SCL-5; SCL-10).

While taking in to account the limitations of the current study, the results indicate that the MHI-5 is a reliable, valid and brief cross-cultural measure of both psychological distress and psychological well-being in adolescent population.

References


