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Posted Date: 27 March 2023

doi: 10.20944/preprints202303.0437.v1

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Differences in Psychological Vulnerability, Mental Health Liter-Acy, Positive Mental Health, and Health Behaviours in Portu-Guese Higher Education Students: A Cross-Sectional Study

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Abstract : Psychological vulnerability (PV) and low mental health literacy correlate negatively with higher education students' positive mental health and health behaviours. Levels of mental health literacy limit self-help, adaptative coping strategies and academic success. However, few studies examine the significant differences between students' PV, mental health literacy, positive mental health (PMH) and modifiable behaviours variables. Identifying modifiable vulnerability factors is essential when seeking and providing professional help. **Method:** A cross-sectional descriptive study was conducted to investigate the differences between modifiable behaviours and PV, mental health literacy, and PMH in higher education students. A sample of 3,600 undergraduate students was recruited, mostly female (78.8%), with an average age of 23 years (SD = 6.68). **Results:** The majority were women, did not exercise, were dissatisfied with sleep quality time per night (62.1% sleep less than 7 hours per night) and did not engage in leisure activities. Also, most respondents had PV and low literacy levels, particularly at F1, and 67.9% scored in the flourishing group. Results showed significant differences ($p<0.001$) between gender, age, sleep, exercise, diet, leisure activities and PV, and PMH and literacy. **Conclusions:** The results identified modifiable vulnerability factors that underpin the design of intervention-targeted programmes to promote literacy and PMH in higher education campuses in Portugal to foster students' well-being and self-help strategies.

Keywords: nursing health promotion; literacy; positive mental health; psychological vulnerability; students

1. Introduction

Higher education students are exposed to multiple modifiable variables that can deprive their mental health. Hence, students' positive mental health (PMH) is essential to cope with daily life adversities (Sequeira et al., 2014). Research shows that low mental health literacy negatively

 doi:10.20944/preprints202303.0437.v1

correlates with positive mental health in higher education students (Nogueira et al., 2022). Importantly, students' optimal mental health is required to achieve positive results at the personal level and academic performance and success (Loureiro, 2018). Also, some health variables negatively influence students' positive mental health (Nogueira, 2017; Sequeira et al., 2014; Teixeira et al., 2022). Additionally, recent studies in higher education students show that psychological vulnerability (PV) is associated with poor levels of PMH (Nogueira et al., 2022; Teixeira et al., 2022), and PV is a negative predictor of mental health~, hindering well-being. PV comprises external dependence on others for self-worth and approval and a rigid global function that increases individuals' vulnerability under stressful environments (Beck & Haigh, 2014; Sinclair & Wallston, 2010). Furthermore, students have low levels of mental health literacy and are unaware of or make little use of adequate help-seeking strategies (Loureiro & Sousa, 2019; Sequeira et al., 2019). The mental health literacy (MHL) concept is grounded on recognising mental disorders, help-seeking efficacy, and help-seeking strategies covering the understanding of how to obtain and maintain good mental health (Anthony Jorm, 2000). MHL definition encompasses the person's knowledge and beliefs about mental problems and disorders enabling him/her to recognise, manage and implement preventive self-care strategies (Munawar et al., 2022; Nobre et al., 2022). Low levels of MHL correspond to difficulties in identifying the main signs and symptoms of mental disorders and their late identification, lack of knowledge and use of self-help strategies, and lack of knowledge about mental health first aid (Aldalaykeh et al., 2019; Ennis et al., 2019; Sastre-Rus et al., 2019). MHL interventions promote positive mental health, reduce stigma, and improve higher-education students' help-seeking behaviours (Loureiro & Freitas, 2020). Low levels of MHL positively correlate with adverse health outcomes and PV (Nogueira et al., 2022; Sequeira et al., 2019). PMH´s concept encompasses the *Salutogenic* perspective since it focuses on positive factors that support health and well-being rather than risks and problems (Bhattacharya et al., 2020). PMH is based on the strengthening and development of the optimal functioning of the human being and represents a specific instance resulting from the interaction of several factors (Lluch, 2002; Roldán-Merino et al., 2017); therefore, it is essential to deal with adversity (Nogueira et al., 2022).

Currently, students make little use of adequate help-seeking and PMH promotion strategies (Loureiro & Sousa, 2019; Sequeira et al., 2019). It is also consensual that mental and physical health are co-dependent as a *health continuum,* influenced by contextual characteristics as positive or negative correlates (Nogueira, 2017; Nogueira & Sequeira, 2018, 2020; Teixeira et al., 2022). Expanding the knowledge about changeable vulnerability factors is relevant to promoting students' healthier behaviours and self-help strategies to increase PMH (Jorm et al., 2007; Loureiro & Sousa, 2019). Therefore, this research sought to explore differences between PV, MHL, PMH, and health behaviour variables in higher education students. Identifying modifiable vulnerability factors is essential to assist students in help-seeking and provide them with professional help.

2. Method

2.1. Study Design and Sample

A cross-sectional descriptive study was conducted. The sample comprised a non-probabilistic convenience sample of 3,600 students from Portuguese universities aged 18 or older eligible to participate. International students were excluded to control the bias of cultural differences. An e-questionnaire (*Google* form) was used for data collection. A filter restriction was used to prevent participants' multiple responses. Then a pilot test was performed with twelve students to confirm the e-questionnaire anonymization and content clarity. Thus, some minor wording was adjusted to avoid possible biases. Furthermore, an automatic follow-up reminder was emailed every ten days during the study period to increase response rates. Finally, questionnaires with more than 5% of unanswered questions were excluded. Students took an average of 17 minutes to complete the e-questionnaire.

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2.2. Data Collection

For data collection, students were invited to access the online Google survey form and were previously asked to complete a consent form. After clicking the "agree" button at the top of the form, the participant confirmed participation in the study. Data were collected from November 2019 to May 2020.

2.3. Variables and Measures

The e-questionnaire covered all variables and measures of the study. Ten demographic and health behaviour variables (gender, age, marital status, work, physical exercise, diet, sleep quality, drinking, medication, and leisure activities) were endorsed by a panel of twelve mental health experts.

The Psychological Vulnerability Scale (PVS) (Sinclair & Wallston, 1999) Portuguese version (Nogueira et al., 2017) was used. PVS is a six-item self-administered instrument was used to measure PV. PVS uses a 5-point Likert scale from 1 = *does not describe me at all* to 5 = *describes me very well.* Total scores range from 6 to 30, with higher scores indicating greater PV and values above 15 indicating psychological vulnerability. The internal consistency of the Portuguese version adequate (*Cronbach alpha* = 0.73), and 5-week stability was excellent (Test-retest, r = .88, p < .0001) (Nogueira et al., 2017).

The **Mental Health Knowledge Assessment (MHKA)** (Yu et al., 2015), validated in Portugal by Chaves, Sequeira & Duarte (2020), was used to measure mental health literacy. MHKA has 20 items and three subscales, using a 5-point Likert scale (1 = I disagree to 5 = I agree). The MHKA higher scores indicate a higher literacy level. The Portuguese version has very good internal consistency (*Cronbach alpha* = .847) (Chaves, Sequeira & Duarte (2020).

The **Positive Mental Health Questionnaire (PMHQ)** (Roldán-Merino et al., 2017) was administered. PMHQ is a 39-item self-administered instrument on a 4-point Likert-type scale (1 = *Always or almost always* to 4 = *Rarely or never)*. Nineteen items stated negatively, and twenty items stated positively. PMHQ has six factors: F1 Personal Satisfaction; F2 Prosocial Attitude; F3 Self-control; F4 Autonomy; F5 Problem-Solving and Personal Achievement; F6 Interpersonal Relationship Skills. PMHQ's total score is the sum of all items, ranging from 39 to 156 points. Higher scores correspond to better PMH status. The Portuguese PMHQ shows a very good internal consistency (total Cronbach α = 0.92 and *Cronbach's alpha* of six factors varying between 0.60 and 0.84), and test-retest (two months interval) revealed strong stability (0.98) (Sequeira et al., 2014). Qualitative analysis scores the following criteria: *languishing* (score 39–78), *Intermediate* (score 79–117), and *Flourishing* (score 118–156), with higher values representing better PMH (Kuettel et al., 2021).

2.4. Ethical Considerations

This study followed the Helsinki Declaration and Oviedo Convention recommendations, the approval of the Ethics Committee of the ESEP (Nursing School of Porto) (CE-ESEP-Flow 2019_1945) and the Board Directors of the institutions involved. Also, authorization was granted by the authors of the mentioned instruments. Participants were previously informed about the purpose and implications of the study and their right to withdraw at any time by not submitting the form, and anonymity was assured. All students gave written informed consent to participate and use the data for research purposes.

2.5. Data Analysis

Data analyses were performed using IBM SPSS Statistics Version 29 (IBM Corp., United States). Participants were excluded if they could not complete a maximum of 10% of missing values on each scale. Descriptive and exploratory statistical analyses were performed by mean, standard deviation, and minimum and maximum values. Cronbach's alpha coefficients were based on standardized items and calculated to assess internal consistency. Independent samples *t-test* and ANOVA were applied, followed by Tukey's test. Results with a $p < 0.05$ were considered significant.

 doi:10.20944/preprints202303.0437.v1

3. Results

The sample comprised 3,600 students aged above 18 (from 17 to 36 years), Mean (M) = 23 and Standard Deviation (SD) = 6.68), Median = 21, and Mode = 23. Most participants (80.5 %) were aged 18 to 25, followed by >30 years (12.1%) and 26-30 (7.4%). Among the participants, 78.8% were women, and 89.5% were single. Participants were enrolled in 20 higher education institutions; most attended the first and second academic years (n = 12,712; 75.3% and n = 888; 24.7%, respectively). More than 25% of participants worked full or part-time. The majority (66.1%) did not work, and (M= 5.6 ± 4.05) worked daily. Of the respondents (68.8%) stated having a healthy diet, including fruit and vegetables, and (95.8%) reported eating three or more meals per day (M=4.3 ± 2.3). Also, (45.6%) were dissatisfied with their sleep quality time per night, 62.1% reported sleeping less than 7 hours (M=6.7 ± 2.8 per night), and 6.1% took sleeping pills. The majority (84.8%) stated they did not engage in any recreational or leisure activities.

Results from the PVS showed that a large percentage (67.8 %) of participants scored above 15 points, indicating participants' psychological vulnerability (M=17.2; SD= 5.3). Item 5 scored the highest (M=2.8; SD=1.3), revealing frustration with achieving goals. Also, students over 30 years showed lower levels of PV. Results from the MHKA revealed the sample's low literacy levels, and the subscale F1 *knowledge about mental health and mental disorders characteristics* had the higher mean score.

The PMHQ showed very good levels for PMH. Most participants (67,9%) scored in the *flourishing* group (range 118-156), 31.5 % in the *intermediate* group (range 79 to 117), and only 0.6% scored in the *languishing* group (range 39 to 78). *Problem-solving and personal achievement* obtained the highest mean values, and *Self-Control* scored the lowest (M= 13.9; SD= 3.2), indicating the need for intervention to increase emotional regulation *and Self-Control* skills.

Differences between PV, PMHQ and MHKA in Demographics and Health Behaviours

Lower levels of PV were found in female participants, younger students (18-25 years), and those who slept less than six hours per night. In addition, those who ate less than six meals per day showed lower levels of PV. In contrast, higher levels of PMH were reached in the older students (over 30 years); who slept more than six hours per night, who exercised (>3 times/week), and who engaged in leisure activities. Participants with better Literacy levels were female students at subscales F1 and F3 but not at F2, who ate more than six meals per day and had better F3 *Awareness of health promotion activities*.

4. Discussion

These study results are similar to previous studies (Nogueira et al., 2021, 2022; Sequeira et al., 2019), and overall, stress that older students have better levels of PMH, literacy and less VP, which is crucial to the health professional and universities. Also, female students showed worse PV and better literacy levels, except for F2. The results showed a high percentage of student-workers, which is likely to be explained by the current socioeconomic and financial context (Jacob et al., 2018; Richardson, Elliott, Roberts et al., 2017; Sanchez-Gelabert et al., 2017)and the lack of time for engaging in activities, as stated by most participants. Students engaging in leisure activities had better levels of PMH. Leisure activities have the potential to shape students individuals' internal kinship and qualities (Aksoy & Arslan, 2019; Richardson, Elliott, & Roberts, 2017). In a recent study with 454 British undergraduate students, Richardson and colleagues found that increased loneliness predicted increased anxiety, stress, depression, and overall worse mental health over time (Richardson, Elliott, & Roberts, 2017). Leisure activities provide individuals with physical and psychological renewal, this being critical for students and young adults since it helps reinforce social skills and affective relationships (Arnett, 2007; Chen & Liu, 2020) and deal with looniness (Richardson, Elliott, & Roberts, 2017).

Most students reported being unsatisfied with their sleep quality, and those who slept more than six hours per night showed lower levels of PV and higher levels of PMH. These results are in line

with international findings (Ghrouz et al., 2019; Mnatzaganian et al., 2020) reporting 51% of students with poor sleep quality, and national studies (Mendes et al., 2019; Silva et al., 2016). Because students often struggle with maintaining good sleep patterns, this result signals a major concern because sleep is an important factor of overall health, and unhealthy sleep has been associated with poor academic performance. Students' poor sleep quality associated with reduced hours of sleep per day (during school time) is one of the strong predictors of poor mental health (Nogueira & Sequeira, 2020), physical health and mental illness, depressive symptoms and anxiety (Wang & Bíró, 2021; Zochil & Thorsteinsson, 2018). Several studies have demonstrated that adequate sleeping, exercise and diet improve positive mental health.

Results from the PVS indicated worse levels of PV compared to previous studies with similar populations (Nogueira, 2017; Nogueira & Sequeira, 2020). This result is of major concern because PV comprises external dependence on others for self-worth and approval. Notably, younger students presented higher PV than older students corroborating previous knowledge. Participants revealed difficulties in dealing with frustration and goal achievement. A recent study found that students often prefer to handle problems alone (56.4%) or talk with friends or relatives (48.0%) rather than seek help from university professionals because they feel embarrassed (Ebert et al., 2019). Also, WMH-ICS surveys report that most first-year students would hesitate to seek help if they ever had emotional problems (WHO, 2018). Therefore, endorsing positive help-seeking behaviours should be a key priority. Some results present modifiable vulnerability factors which allow designing programmes fostering students' well-being and self-help strategies (Ennis et al., 2019). Importantly, this knowledge is relevant for future research, namely to identify variables that are predictors and negative correlates of positive mental health in students.

The low literacy levels in the present study should be interpreted with caution. Notwithstanding these results, similar outcomes were found in other studies with the overall population and students (Dias et al., 2018; Oliveira et al., 2022). MHL is essential for students' health promotion because it refers to knowledge of how to obtain and maintain good mental health (recognise mental disorders, help-seeking efficacy, and help-seeking strategies) (Sykes et al., 2021). Some studies highlight the need to invest in programmes to promote MHL on campuses and mental health first aid skills (Forbes et al., 2022; Mendes et al., 2022). Good levels of MHL allow students to recognise signs and symptoms of mild to moderate problems, when and where to seek help and develop self-management skills to improve well-being versus psychological suffering.

Most participants scored in the *flourishing* group; however, this score was well above the score of 83.4 found by Sequeira and colleagues in 2019 in a study with nursing students (Sequeira et al., 2019). PMH is essential for good overall cognitive functioning (dealing with emotions, interacting socially with family and friends), making the most of the one's potential, and coping with everyday life (Lluch, 2002; Nogueira & Sequeira, 2020). Thus, this is exciting news since better PMH means better lifestyles and academic achievement. The higher scores for *Problem-Solving and Self-Actualisation* and *Personal Satisfaction* subscales were unexpected but relevant, revealing the participants' high perception of self-fulfilment, analytic and flexibility skills, and decision-making and adaptation skills. These capacities indicate the students' attitudes toward self-development and growth and prosocial attitudes and autonomy. Having PMH is indicative of the ability to perceive, understand and interpret the environment, to adapt and change it, if necessary, to feel good, think and communicate with others as a state of optimal functioning of the human being (Sequeira et al., 2014, 2019). These aspects, associated with the remarkable ability to establish interpersonal relationships, verified in the sample under study, are likely to promote students' good mental health. Notably, the lowest score was found in *Self-control*, showing a lack of emotional balance and control, which may indicate the students' difficulties coping with stress in conflict situations and anxiety. This result emphasizes the need for strategic interventions to increase tolerance to frustration and promote skills to manage negative emotions.

Limitations

The findings may have been somewhat limited by the bias of the self-report instruments, which can have led the participants to under-or over-report certain types of behaviour, depending on whether they considered it socially acceptable or otherwise (social desirability).

5. Conclusions

Overall, participants showed moderate psychological vulnerability and low literacy levels, particularly at F1- *knowledge about mental health and mental disorders characteristics*. The majority scored in the *flourishing* group, despite having self-control issues. Results show significant differences in PV, PMH and Literacy considering gender, age, and health behaviours. The results identified modifiable vulnerability factors that support the need to implement intervention-targeted programmes to promote positive mental health behaviours in university campuses in Portugal, thus fostering students' well-being and self-help strategies.

6. Relevance for Clinical Practice

Results highlighted the knowledge about students' needs. These data are crucial to designing and implementing positive mental health behaviour programmes on campus. These interventions must reinforce modifiable healthy aspects and positive mindsets through workshops (sleep; stress; aggressivity; well-being, and relaxation strategies). They are also crucial for strengthening resilience and literacy and overcoming constraints to help-seeking behaviours. In addition, inclusive assistance, counselling, pedagogical support and sports programmes are also needed.

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