

Migraines and Family Life: Adaptation and Validation of the Portuguese Version of the IMPAC Scale

Sofia Knittel^{1,2} and David Dias Neto^{1,2}

¹ISPA – Instituto Universitário, Lisbon, Portugal; ²Applied Psychology Research Center Capabilities & Inclusion, Lisbon, Portugal

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ABSTRACT

Migraine is a prevalent disorder imposing a great, pervasive burden on the bearer's life. However, research is lacking on the individual and family impact of migraines. This study aims to adapt and validate a Portuguese version of the Impact of Migraine on Partners and Adolescent Children (IMPAC) scale, analyzing its psychometric properties. Four hundred eighty six individuals with migraines answered an online questionnaire, also containing a health-related quality of life measure – SF-12. The IMPAC-P presented good psychometric properties and fit of the theoretical model with three underlying factors – Activity Limitations, Partner Interaction, and Children Interaction. The impact of migraines was higher in women, single or widowed individuals, and those aged 21 to 40, exhibiting a significant and negative correlation with SF-12. The IMPAC-P is a brief, valid, reliable, and sensitive tool for assessing the impact of migraines on the bearer's life and family in both clinical and research contexts.

Las migrañas y la vida familiar: adaptación y validación de la versión portuguesa de la escala IMPAC

RESUMEN

La migraña es un trastorno prevalente que impone una carga grande y generalizada en la vida del que la sufre. No obstante, falta investigación acerca de la repercusión individual y familiar de la misma. El estudio adapta y valida la versión portuguesa de la escala sobre Repercusión de la Migraña en la Pareja e Hijos Adolescentes (IMPAC según sus siglas en inglés), analizando sus propiedades psicométricas. Una muestra de 456 sujetos que padecían migrañas contestó al cuestionario online, que incluía igualmente una medida de calidad de vida relativa a la salud (la SF-12). La escala presenta buenas propiedades psicométricas y un buen ajuste al modelo teórico, con tres factores subyacentes (limitaciones de la actividad, interacción de pareja e interacción entre los hijos). El impacto de las migrañas era superior en las mujeres y personas solteras o viudas así como en las personas de entre 21 y 40 años de edad, habiendo una correlación negativa significativa con la SF-12. Se trata de una herramienta breve, válida, fiable y sensible para evaluar el efecto de las migrañas en la vida de quien las sufre y de la familia, tanto en contextos clínicos como de investigación.

Migraine is a common and recurring neurological condition that causes a headache lasting 4 to 72 hours. The pain is usually unilateral with a pulsating quality and moderate to severe intensity. It is generally associated with nausea or vomiting, photophobia, and phonophobia aggravated by physical activity (Barros, 2005; Martin et al., 2000; McPhee & Robinson, 2020). Due to the nature of this disorder, it is currently considered the most frequent and worldwide cause of disability for people under the age of 50 and the leading cause of years of lost healthy life in young women (Gil-Gouveia et al., 2021; Murray & Lopez, 1996; Steiner et al., 2020). In Portugal, the prevalence of migraine is estimated to be 15%, affecting mainly

women between 15 to 49 years old, which corresponds to the global tendency (Barros, 2005; Lipton, Bigal, et al., 2003; Pereira-Monteiro, 1995). Furthermore, because migraine causes episodes of absolute and temporary incapacity for young and active individuals, it poses a significant burden on a myriad of aspects concerning the bearer's life, generating absenteeism, reduced productivity, and even unemployment which, in turn, gives rise to an economic impact on society (Gil-Gouveia & Martins, 2010; Hamelsky & Lipton, 2006; Lipton, Bigal, et al., 2003). Moreover, it is responsible for diminished health-related quality of life (HRQoL). It affects women more than men – presenting a gender ratio of 3:1 – especially at a younger age,

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Correspondence: sofiaknittelpsi@gmail.com (S. Knittel).

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which considerably impacts family life and child-rearing (Hamelsky & Lipton, 2006; Lipton, Bigal, et al., 2003; Martínez-Fernández et al., 2020; Monteiro, 2005).

Regarding family relationships, the literature on this topic suggests it is one of the most impacted areas. Migraine has a substantial and disturbing effect on partners and children of individuals who experience this disease (Barros, 2005; Buse et al., 2019; Smith, 1998). Thus, the evidence demonstrates, as frequent consequences, cancellation or postponement of domestic or social activities, reduced participation or enjoyment in family activities, increased likelihood of arguing, and increased financial burden (Bigal et al., 2001; Buse et al., 2016, 2019; Lipton, Bigal, et al., 2003; Marzouk & Seng, 2020; McPhee & Robinson, 2020; Smith, 1998). Additionally, partners also refer experiencing difficulties in embracing the caregiver role and frustration with their social and recreation loss and decreased intimacy. On the other hand, children tend to react with hostility and fear (Buse et al., 2016; Lipton, Bigal, et al., 2003; Marzouk & Seng, 2020; Smith, 1998).

Consequently, these factors influence an individual's perceived HRQoL, decreasing as migraines' frequency increases. The unpredictability of the disease, which manifests in attacks in response to various triggers, and its disabling burden explain migraines' impact on HRQoL, frequently causing depression, anxiety, and phobias (Canavaro et al., 2010; Corchs et al., 2006; Hamelsky & Lipton, 2006; Leonardi & Raggi, 2019; Lipton et al., 2000; Martin et al., 2000; Martínez-Fernández et al., 2020).

Despite ample medical research exploring ways to treat and prevent migraines, there is a lack of research exploring the pervasive burden migraines impose beyond the bearer, such as the family. Considering this substantial impact, it is urgent to address these issues to help patients who suffer from migraines and their families better and systemically. Nonetheless, this scarcity also contributes to the shortage of instruments regarding the impact of this disease on patients' psychological well-being and quality of life, influenced by several factors, such as the limitations imposed on daily activities. In addition, there are no validated tools for assessing the effect of migraines on the family. Furthermore, this reality is even more concerning in Portugal and in Portuguese-speaking countries, where, to our knowledge, no validated instruments have been developed.

Impact of Migraine on Partners and Adolescent Children Scale (IMPAC)

Lipton et al.'s (2017) developed the IMPAC scale in 2017 to create a brief and psychometrically sound instrument able to measure the impact of migraines on the family as perceived by the proband. For that matter and to better represent different household compositions, migraine patients are classified into four subscales: 1) probands living without a partner or child(ren), 2) with a partner only, 3) with child(ren) only, and 4) with partner and child(ren) – and are asked to respond to items concerning the limitations felt in daily activities and partner and child(ren) interactions. Thus, the 12 items cover all household compositions and are composed of a 4-point Likert-type scale (Lipton et al., 2017). This instrument presents a three-factor structure consisting of the following factors: Activities (6 items loaded), Partner Interactions (3 items loaded), and Children Interactions (3 items loaded) (Lipton et al., 2017). The psychometric properties of this instrument reveal good internal consistency and a strong and significant correlation with other instruments (Lipton et al., 2017).

Goals

This study aims to adapt and validate the IMPAC scale to the Portuguese population, examining its psychometric properties,

such as sensitivity (values of skewness and kurtosis), validity (factor structure and concurrent validity with an HRQoL instrument), and reliability (internal consistency). Due to the absence of validated instruments in the national context, our goal is to provide a brief, reliable, and valid tool for physicians in a clinical context to understand better and help patients with migraine. Therefore, it allows for a multidisciplinary approach that considers this disease's multiple impacts on the bearers and their family. Furthermore, we intend to validate an instrument that can be used to extend the research on this topic.

Method

Participants

The study sample consisted of 486 participants with a history of episodic or chronic migraines, recruited between March and July 2021 through MiGRA Portugal and social media support groups for people who suffer from the disease. Therefore, it is a convenience sample. Of these, 460 (94.7%) participants were female and the remainder 26 were male (5.3%), reflecting the global tendency of this disorder that suggests that women are more affected than men – gender ratio 3:1 (Barros, 2005; Lipton, Bigal, et al., 2003; Murray & Lopez, 1996). Furthermore, mean age was 39.4 years ($SD = 10.9$), and the most common academic qualification was university degree (43.4%). Regarding marital status and household composition, 45.9% of participants reported being married and 60.1% mentioned having children. Table 1 details participants' sociodemographic characteristics.

Table 1. Sociodemographic Characteristics of the Sample

Sociodemographic Characteristics	Frequency	Percentage %
Age, Years		
11-20	10	2.05
21-30	98	20.16
31-40	151	31.06
41-50	162	33.30
51-60	48	9.87
61-70	14	2.88
71-80	3	0.62
Total	486	100
Academic Qualification		
< High School	38	7.9
High School	118	24.3
University Degree	211	43.4
Masters	99	20.4
PhD	12	2.5
Other	8	1.6
Total	486	100
Marital Status		
Married	223	45.9
Cohabiting	84	17.3
Single	149	30.7
Divorced	26	5.3
Widow	3	0.6
Total	485	99.8

Regarding diagnosis, 423 participants (87%) reported being diagnosed with either episodic or chronic, with or without aura migraine. In 64.6% of the cases the diagnosis was made by a neurologist, in 22% by a general practitioner, and in 10.1% different options were selected (e.g., dentist, psychiatrist, or doctor in the ER). Furthermore, 447 individuals (92%) reported having experienced a migraine in the last three months. Considering ID-Migraine™s (Gil-

Gouveia & Martins, 2010) results, it was possible to understand that due to migraines 87.7% felt limited in their ability to work for at least one day, 83.1% felt nauseated or sick, and 79.6% mentioned feeling bothered by lights. In addition, it was observed that 50.6% of the participants indicated not resorting to preventive medication, whereas 87.2% mentioned resorting to abortive or acute medication.

Instruments

Sociodemographic Questionnaire

This questionnaire contained sociodemographic variables, such as age, gender, educational level, marital status, and household composition. Moreover, it included questions about participants' migraines, for instance, their frequency, diagnosis, and treatment.

ID-Migraine™

This measure is a very brief, valid, and reliable screening tool for migraine diagnosis. It has been studied in five other languages: English (original), Italian, Turkish, Brazilian Portuguese, and Chinese (Brighina et al., 2007; Karli et al., 2007; Lipton, Dodick, et al., 2003; Mattos et al., 2017; Wang et al., 2015). It consists of three Yes/No questions designed for self-assessment. The Portuguese adaptation of the original instrument was performed by Gil-Gouveia and Martins (2010) and presented good psychometric properties, namely high internal consistency (i.e., $\alpha = .78$), sensitivity, and positive predictive value. Furthermore, it exhibits low variation in clinically relevant subgroups. These psychometric properties were also found in the other versions of the instrument (Gil-Gouveia & Martins, 2010).

Impact of Migraine on Partners and Adolescent Children Scale (IMPAC)

The IMPAC questionnaire was designed to assess the family impact of migraine as perceived by the proband and on different domains, such as interpersonal relationships, activities, well-being, and HRQoL (Lipton et al., 2017). To serve this purpose, it consists of 12 items: of those, 4 items apply to migraine probands with partners/spouses ("My partner gets upset or angry at me for having headaches" – item 6), another 4 to probands with children ("If I didn't have headaches, I would be a better parent" – item 11), 4 more items to probands with both partners/spouses and children and, finally, 4 additional items applying to all groups ("Because of your headaches, how many times during this past 30 days did you not participate in family activities at home? – item 1) (Lipton et al., 2017). The scoring system assesses mild, moderate, severe, and very severe family impact. The IMPAC scale is a brief, robust, and psychometrically sound instrument, presenting adequate reliability (i.e., $\alpha = .85$) and correlating with other variables such as anxiety or quality of life (Lipton et al., 2017).

12-Item Short-Form Health Survey (SF-12)

SF-12 was utilized to get evidence of validity, specifically for extracting validity evidence based on the relationship to other variables. This measure is considered a shorter version of the SF-36 questionnaire, utilizing a subset of 12 items from the latter. Due to this reduction, the SF-12 is easier and quicker to complete although it reproduces the same measurement properties, such as high internal consistency (i.e., $\alpha = .84$) (Gandhi et al., 2001; Ware et al., 1996). This questionnaire covers 8 HRQoL domains, considering an individual's perception of their health in the last four weeks, grouped into the Psychological Component Summary and the Mental Component Summary.

Procedure and Analysis

First, consent from the authors of the original version of IMPAC was acquired. Then, the translation and cross-cultural adaptation started, following the recommendations. Initially, two Portuguese native speakers who were fluent in English independently translated the scale items to Portuguese. Subsequently, the translations were compared, and the divergences were resolved to achieve a single version of the questionnaire. At the same time, minor cultural adaptations were made. For instance, the activity "bowling" was replaced by "fazer jogos ao ar livre", and the expression "not cut the grass" was translated as "não passar a ferro, aspirar, limpar o pó". These modifications ensured that the items matched the reality in Portugal. Subsequently, two other independent English fluent speakers not included previously back-translated the questionnaire to English. Both productions were compared and a pre-final version of the IMPAC scale, as translated to Portuguese, was reviewed by the executive members of MiGRA Portugal, who suffer from migraines. This step allowed for better clarification of items that could be ambiguous or unclear. It was a way of assessing content validity and, therefore, face validity due to the concurrent use of expert and target population judges on this specific matter. The final Portuguese version of the IMPAC scale was created after consensus was obtained.

The questionnaire presented to the participants was available in online support groups for individuals who suffer from migraines. It was disseminated by both the researchers and by the association MiGRA Portugal. Before participating in the present study, all participants were invited to fill out an informed consent. Additionally, confidentiality was assured.

Finally, the psychometric analysis was conducted using SPSS – Statistical Package for the Social Sciences version 27 and JASP version 0.16.04. The latter was used to perform confirmatory factor analysis. The internal consistency, validity evidence based on the internal structure (exploratory and confirmatory factor analysis) and the relation between the construct and other variables were assessed (Boateng et al., 2018). Additionally, we used a significance level of .05 for all statistical tests.

Table 2. Items' Sensitivity Analysis

Items	Mean	SD	Skewness	Kurtosis
Item 1	2.41	1.039	0.805	0.270
Item 2	2.50	1.180	0.814	-0.183
Item 3	2.47	0.977	0.758	0.348
Item 4	2.52	1.046	0.675	-0.081
Item 5	2.68	1.122	0.657	-0.358
Item 6	1.57	0.885	1.320	0.529
Item 7	1.56	0.839	1.211	0.163
Item 8	1.60	0.878	1.149	0.008
Item 9	2.55	1.022	0.792	0.176
Item 10	2.83	0.996	-0.543	-0.715
Item 11	2.77	1.106	-0.464	-1.114
Item 12	3.01	0.955	-0.722	-0.391

Results

The values of skewness and kurtosis were considered to assess the items' sensitivity, which should be $< [3]$ and $< [8]$, respectively (Marôco, 2010). According to Table 2, the normal distribution is assured since all 12 items present acceptable values regarding skewness and kurtosis. Therefore, it is possible to evaluate the factor structure of this instrument through exploratory factor analysis.

Identifying the Factor Structure of IMPAC

Regarding the internal factor structure of IMPAC, an exploratory factor analysis was performed (Boateng et al., 2018). First, an analysis of the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was conducted, resulting in a value of .786, which reveals good adequacy for the factor analysis and a strong correlation between variables. Additionally, Bartlett's test of sphericity presented a significant correlation, $\chi^2(66) = 572.867, p < .001$.

The exploratory factor analysis proceeded using principal component analysis with varimax rotation in a random subsample obtained from randomly dividing the original sample in two. It was possible to observe, through total variance explained that there are three underlying factors whose eigenvalue is at least 1 (Table 3) and therefore explain the 12 items of the instrument. Further and as observed in Table 3, the cumulative sums of squared loadings indicate that these three factors explain 65.42% of the total variance, above the minimum score (65.42% > 50%). The communalities were observed to understand the proportion of variance accounted for by selected components. The items explain 54.1% to 71.1% of the construct's variance before the rotated component matrix. Finally, the rotated component matrix was carried out using varimax rotation with Kaiser normalization and principal component analysis extraction method. The output in Table 3 demonstrates that the first component or factor is constituted by 6 items, the second ranges from item 6 to 8, and, finally, the third factor or component is measured by items 10 to 12. These three components correspond to Activities, Partner Interactions, and Children Interactions factors, respectively. The scale - .80 - and each factor's internal consistency were evaluated using Cronbach's alpha and are presented in Table 3. As evidenced, this measure's internal consistency and its factors are good, ranging from .72 to .86 (Table 3).

Table 3. Total Variance Explained, Rotated Component Matrix's Loadings, and Reliability

Components	Total Variance Explained		Reliability Cronbach's Alpha	
	Cumulative Sums of Loading	Item		
				Loadings
Factor 1 Activity Limitations	30.682%	1	.815	.86
		2	.761	
		3	.834	
		4	.818	
		5	.789	
Factor 2 Partner Relationship	48.062%	9	.643	.78
		6	.833	
		7	.756	
Factor 3 Children Relationship	65.425%	8	.842	.72
		10	.744	
		11	.746	
		12	.860	

To verify the factor structure obtained through exploratory factor analysis, the researchers conducted a confirmatory factor analysis with the remaining subsample to ensure cross-validation and to

avoid biases in the results. We would like to point out that, because this questionnaire uses a 4-point type-Likert scale, we have used the DWLS [diagonally-weighted least squares] method to carry out this analysis (Li, 2015).

Firstly, regarding the chi-square test, the three-factor structure did not prove to be a significant fit for the model, $\chi^2(51) = 56.166, p = .287$. However, recent literature has described this test as a conventional measure only and less of a decisive fit index, due to its sensitivity to sample size and model complexity (Alavi et al., 2020). Subsequently, it is advisable to confirm the model through additional fit measures, such as the comparative fit index (CFI), which demonstrated, in our sample, the appropriateness of the three-factor structure (CFI = .990) by indicating a very good model fit, and through root mean square error of approximation, which was considered good (RMSEA = .032). Regarding loading, all items were significant and ranged between .435 and .930 ($p < .001$).

Furthermore, the discrimination index was assessed to evaluate the item-test correlations for each item. Table 4 shows that all items, except the last one, present correlations above .30, ranging from .25 to .59. Thus, these values indicate good discrimination properties among individuals suffering from migraines.

Table 4. Discrimination Index: Item-Test Correlations

Items	Item-Test Correlations
Item 1	.485
Item 2	.416
Item 3	.530
Item 4	.590
Item 5	.474
Item 6	.386
Item 7	.425
Item 8	.309
Item 9	.530
Item 10	.358
Item 11	.448
Item 12	.248

Exploring the Correlation between IMPAC-P and SF-12

As evidenced in the literature, the impact of migraines in the different aspects of the bearer's life should be negatively correlated with the HRQoL experienced. Intending to test this hypothesis, the investigators assessed Pearson's *r* correlation between the IMPAC-P scale and SF-12, an instrument designed to measure HRQoL. This analysis revealed that IMPAC-P and SF-12 are significantly and negatively correlated and with a value lower than .30 ($r = -.277, p < .001$), meaning that the participants could understand these constructs as different as expected (Urbina, 2014). These results also indicate that greater family impact is associated with a decrease in HRQoL.

Additional analyses were conducted regarding the full scale and its three factors, according to its scoring system and other sociodemographic variables, such as sex, age group, and marital status. Firstly, the experienced impact was assessed regarding each household composition and considering the scoring system proposed

Table 5. Total Score of IMPAC-P per Household Composition

Household Composition	Mean	SD	Minimum/ Maximum	Degree of Severity
Proband living alone <i>n</i> = 409	9.90	3.37	4/20	Very severe
Proband living with partner <i>n</i> = 323	17.24	4.79	8/31	Very severe
Proband living with child(ren) <i>n</i> = 250	21.02	5.02	8/33	Very severe
Proband living with partner and child(ren) <i>n</i> = 223	28.60	6.54	12/46	Very severe

Table 6. Independent-samples *t*-test: Experienced Impact x Sex

	Mean	SD	Test Statistics
Proband living alone <i>n</i> = 409	Women: 10.01 Men: 7.70	Women: 3.36 Men: 3.03	$t(407) = 3.016,$ $p = .003$
Proband living with partner <i>n</i> = 323	Women: 17.35 Men: 14.46	Women: 4.78 Men: 4.29	$t(321) = 2.145,$ $p = .033$
Proband living with child(ren); <i>n</i> = 250	Women: 21.18 Men: 15.58	Women: 4.92 Men: 5.62	$t(248) = 2.958,$ $p = .003$
Proband living with partner and child(ren); <i>n</i> = 223	Women: 28.76 Men: 23.17	Women: 6.49 Men: 6.55	$t(221) = 2.080,$ $p = .039$

by Lipton et al., 2017. Of this analysis resulted that all the subgroups (e.g., probands living alone, with partner only, with child[ren] only, with partner, and child[ren]) presented, in average, a very severe impact, as illustrated in Table 5. Further and more detailed analyses were conducted to better understand these results.

As evidenced on Table 6, an independent-samples *t*-test indicated that women revealed a significantly higher impact than men on the total score of IMPAC-P and on every subgroup determined by household compositions and in accordance with the scoring system proposed by Lipton et al., 2017.

Regarding age group, there were only significant differences, as determined by one-way ANOVA, on the proposed Children Interactions factor, indicating a higher impact between 21 to 40 years, $F(6) = 7.810, p = .001$. In addition and on the Marital Status variable, significant differences were found in the Children Interactions factor, that reveals a higher impact on bearers who report being single or widow, $F(4) = 2.542, p = .04$. Finally, no significant differences were reported in terms of academic qualification concerning the total score of the IMPAC scale and the three factors.

Moreover, researchers conducted a one-way ANOVA relating the items of ID-Migraine™ with IMPAC-P. This analysis showed significant differences concerning the experienced impact of migraines on the total score between participants who did and did not report photophobia. The first revealed experiencing a bigger burden and a higher limitation associated with having migraines, $F(1) = 4.426, p = .037$.

Lastly, we analyzed differences in the reported perceived impact between individuals who take preventive medications and those who take acute or abortive medications. The latter group ($MD = 28.63, SD = 6.37$) demonstrated a significantly higher experienced impact on IMPAC-P total score, $t(15.049) = .186, p = .040$.

Discussion

The current research aimed to adapt and validate the IMPAC scale to the Portuguese adult population due to a lack of research on this topic and, consequently, the inexistence of validated instruments for Portuguese-speaking countries.

The statistical results demonstrate that IMPAC-P has good psychometric properties: it is a sensitive, robust, valid, and reliable instrument for assessing the impact of migraines on the bearer's family and activities in day-to-day life, as perceived by the proband. Additionally, the scale presented good internal consistency, similar to the original version of IMPAC (Lipton et al., 2017).

The exploratory factor analysis revealed a three-factor model consisting of the following factors: Activities, Partner Interactions, and Children Interactions. This factor structure follows the original version, which allows for a better understanding of four different household compositions (proband alone, proband with a partner, proband with child/ren, and proband with partner and child/ren) (Lipton et al., 2017). This is key for better understanding the family dynamics involved in the pervasiveness of the disease under study. Also, the confirmatory factor analysis corroborated the structure

found in IMPAC-P, which demonstrates that the original version's factor structure was reproduced in this study's sample. This evidence shows that, across cultures, the perceived impact is described similarly, presenting three main factors that correspond to family interactions. Thus, it is expectable that individuals report the burden associated with the typical members of the family system, such as partner and children, besides themselves and the impact experienced in daily activities.

Regarding the discrimination index, our data exhibits good discrimination properties among individuals suffering from migraines, except in the last item. Therefore, it is advised that this item should be reexamined in future studies and eventually modified or even removed from the pool of items, if it continues showing poor psychometric properties (Boateng et al., 2018).

Furthermore and as expected, the IMPAC-P correlated negatively with SF-12, an instrument of health-related quality of life. This evidence mirrors literature findings, according to which individuals who suffer from migraines report lower quality of life associated with higher experienced disability (Canavarro et al., 2010; Hamelsky & Lipton, 2006; Leonardi & Raggi, 2019; Lipton, Bigal, et al., 2003; Lipton et al., 2017; Lipton et al., 2000; Martin et al., 2000; Martínez-Fernández et al., 2020). Both the unpredictability of the disease, where patients cannot foresee their crisis, and its pervasive burden, that impedes the individual from performing daily life activities concerning family and work, contribute to the decrease in perceived quality of life (Hamelsky & Lipton, 2006; Leonardi & Raggi, 2019; Martínez-Fernández et al., 2020). Concurrently, patients also are affected by their angst, choosing not to enrol in certain activities due to the fear of experiencing an attack (Corchs et al., 2006). However, the correlation is not as high as expected, and therefore we hypothesize whether there might exist a moderating variable influencing this relationship.

Further research clarified variables contribution to a higher perceived impact, such as gender, age, household composition, marital status, associated symptoms, and treatment, according to what has been previously studied. Firstly, results show that women experience a significantly higher impact in the total score of IMPAC-P and across all other factors, which can be explained both by the discrepancy between female and male participants and or by other gender differences, such as women being more willing to participate in studies. Considering that our society is structured around the fact that women tend to be the primary caregiver of their children and the person who assumes most of the housework, it is expected of women to combine and fulfill their parenthood, relational, home-related, and professional responsibilities and requirements. Therefore, we hypothesized that the temporary disability induced by migraines has an especially higher and more negative impact on women due to the way it collides with the different roles society expects women to play. More specifically regarding children, migraines can be detrimental to the mother's perception of her mother-child relationship, as evidenced in this study, where 67% of women reported believing that they would be better parents if not for migraines when compared to men (Lipton, Bigal, et al., 2003; Marzouk & Seng, 2020). Further, this disease can also impact the affective relationships of the migraineur,

negatively affecting the time spent with partners and its quality and intimacy (Buse et al., 2019; Lipton, Bigal, et al., 2003; McPhee & Robinson, 2020; Smith, 1998). Both of these questions rely on the feeling of not being able to behave following social and personal expectations of the female role and consequently feeling like failing due to the disability caused by migraines (Lipton, Bigal, et al., 2003; Marzouk & Seng, 2020).

Concerning age and as the literature proposes, we observed that individuals between the ages of 21 and 40 are the most affected by migraines, which corresponds to the young and active years (Barros, 2005; Lipton, Bigal, et al., 2003; Martin et al., 2000; Marzouk & Seng, 2020; Pereira-Monteiro, 1995). In this research, the experienced impact was significantly higher concerning the Children Interactions factor: we hypothesize this relationship to be influenced by the fact that it is in this age range (21 to 40) that individuals tend to have children while keeping up with the demands of professional life. When experienced together with the challenges of parenthood, migraine poses a more pervasive impact on the time spent and activities performed as a family (Marzouk & Seng, 2020).

Regarding marital status, the researchers found that individuals who report being single or widowed reveal a higher impact on the Children Interactions factor. This can be explained by the added burden, to the migraineur, of looking after children without a spouse or partner with whom some of the responsibilities of child-rearing could be shared (Buse et al., 2016, 2019). Thus, single or widow parents experience the temporary limitations imposed by migraine more strongly when it comes to children interaction. This may involve spending time together or helping with day-to-day activities. The ultimate consequence is perceiving their children as more significantly affected, negatively influencing their sense of effective parenting (Buse et al., 2016, 2019; Marzouk & Seng, 2020; Smith, 1998).

Researchers found photophobia as one of the leading causes of higher experienced impact in terms of associated symptoms. As demonstrated by literature, such a symptom imposes a significant deterioration in normal daily functioning as it is considered the second most debilitating symptom reported by people with migraines due to light-induced pain (Drummond, 1986; Martin et al., 2000; McAdams et al., 2020; Seidel et al., 2017).

Finally, researchers observed that individuals who report taking acute medication experience a significantly higher impact than those with preventive medication. This tendency could be explained by evidence suggesting prophylactic therapy has long-lasting and more effective outcomes since its goals are preventing and reducing attack frequency and severity. In contrast, acute treatment is used in specific episodes only and aims to restore full function within 2 hours of treatment (Rizzoli, 2012).

This study showed that migraines affect not only the patient, but also the rest of the family, especially children, negatively impacting daily activities and thus leading to reduced participation and enjoyment (Buse et al., 2019). In view of this information, we can now highlight the urgency of working in a multidisciplinary and systemic perspective with patients and everyone who must deal with a chronically ill parent or partner, allowing for better interventions. In light of these findings, we encourage healthcare professionals to adopt a comprehensive attitude, assessing which resources could benefit the migraineurs and their families, such as educational programs, cognitive behavioral therapy, or family therapy. Consequently, the goal should be to reduce the frequency and severity of attacks and mitigate the burden migraines have on bearers and their family lives.

The present study has two limitations. First of all, although representative of the general prevalence of migraines, the number of male participants in this sample was significantly low. Therefore, there is a need to include, in the future, a more representative sample. Secondly, the IMPAC-P is a self-reported measure which can cause social desirability. Future research should be conducted

to understand how the perceived impact varies with the number of reported migraines per month and explore partners' and children's perceptions of migraine impact. In addition, it is fundamental to assess the correlations between IMPAC-P and other instruments focused on this topic.

Conclusion

As the first adaptation and validation of the IMPAC scale to the Portuguese population, this instrument proved to be a sensitive, valid, and reliable tool for assessing the impact of migraine on the migraineurs and their families. Additionally, IMPAC-P presents the same factor structure as the original scale. Further studies should be conducted to explore this variable as perceived by family members.

IMPAC-P is encouraged in the clinical context to assist healthcare professionals in better understanding and acting upon the systemic environment surrounding the patient. Tackling the impact of migraines in household dynamics and providing supportive resources for the family can significantly improve migraine management.

Conflict of Interest

The authors of this article declare no conflict of interest.

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References

- Alavi, M., Visentin, D., Thapa, D., Hunt, G., & Watson, R. (2020). Chi-square for model fit in confirmatory factor analysis. *Journal of Advanced Nursing*, 76(9), 2209-2211.
- Barros, J. (2005). Enxaqueca: clínica e diagnóstico. *Dor*, 13(1), 17-21.
- Bigal, M., Bigal, J., Betti, M., Bordini, C., & Speciali, J. (2001). Evaluation of the impact of migraine and episodic tension-type headache on the quality of life and performance of a university student population. *Headache*, 41(7), 710-719. <https://doi.org/10.1046/j.1526-4610.2001.041007710.x>
- Boateng, G., Neilands, T., Frongillo, E., Melgar-Quinonez, H., & Young, S. (2018). Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Frontiers in Public Health*, 6, Article 149. <https://doi.org/10.3389/fpubh.2018.00149>
- Brighina, F., Salemi, G., Fierro, B., Gasparro, A., Balletta, A., Aloisio, A., La Pegna, G., Randisi, G., Saportio, V., Calagna, G., La Naia, F., & Morana, R. (2007). A validation study of an Italian version of the "ID-Migraine". *Headache*, 47(6), 905-908. <https://doi.org/10.1111/j.1526-4610.2006.00628.x>
- Buse, D., Fanning, K., Reed, M., Murray, S., Dumas, P., Adams, A., & Lipton, R. (2019). Life with migraine: Effects on relationships, career, and finances from the Chronic Migraine Epidemiology and Outcomes (CaMEO) study. *Headache: The Journal of Head and Face Pain*, 59(8), 1286-1299. <https://doi.org/10.1111/head.13613>
- Buse, D., Scher, A., Dodick, D., Reed, M., Fanning, K., Adams, A., & Lipton, R. (2016). Impact of migraine on the family: Perspectives of people with migraine and their spouse/domestic partner in the CaMEO study. *Mayo Clinic Proceedings*, 91(5), 596-611. <https://doi.org/10.1016/j.mayocp.2016.02.013>
- Canavarro, M., Pereira, M., Moreira, H., & Paredes, T. (2010). Qualidade de vida e saúde: aplicações do WHOQOL. *Alicerces*, 3(3), 243-268.
- Corchs, F., Mercante, J., Guendler, V., Vieira, D., Masruha, M., Moreira, F., Bernik, M., Zukerman, E., & Peres, M. (2006). Phobias, other psychiatric comorbidities and chronic migraine. *Arquivos de Neuro-Psiquiatria*, 64(4), 950-953. <https://doi.org/10.1590/S0004-282X200600600012>
- Drummond, P. (1986). A quantitative assessment of photophobia in migraine and tension headache. *Headache: The Journal of Head and Face Pain*, 26(9), 465-469. <https://doi.org/10.1111/j.1526-4610.1986.hed2609465.x>
- Gandhi, S., Salmon, J., Zhao, S., Lambert, B., Gore, P., & Conrad, K. (2001). Psychometric evaluation of the 12-item Short-Form Health Survey (SF-12) in osteoarthritis and rheumatoid arthritis clinical trials. *Clinical Therapeutics*, 23(7), 1080-1098. [https://doi.org/10.1016/S0149-2918\(01\)80093-X](https://doi.org/10.1016/S0149-2918(01)80093-X)
- Gil-Gouveia, R., & Martins, I. (2010). Validation of the Portuguese version of the ID-Migraine™. *Headache: The Journal of Face and Head Pain*, 50(3), 396-402. <https://doi.org/10.1111/j.1526-4610.2009.01449.x>

- Gil-Gouveia, R., Pereira, L., Machado, S., & Parreira, E. (2021). Organização de serviços de apoio clínico para doentes com cefaleias em Portugal. *Sinapse*, 21(2), 112-120.
- Hamelsky, S., & Lipton, R. (2006). Psychiatric comorbidity of migraine. *Headache*, 46(9), 1327-1333. <https://doi.org/10.1111/j.1526-4610.2006.00576.x>
- Karli, N., Ertas, M., Baykan, B., Uzunkaya, O., Saip, S., Zarifoglu, M., & Siva, A. (2007). The validation of ID-Migraine™ screener in neurology outpatient clinics in Turkey. *The Journal of Headache and Pain*, 8(4), 217-223. <https://doi.org/10.1007/s10194-007-0397-4>
- Leonardi, M., & Raggi, A. (2019). A narrative review on the burden of migraine: When the burden is the impact on people's life. *The Journal of Headache and Pain*, 20(41), 1-11. <https://doi.org/10.1186/s10194-019-0993-0>
- Li, C. (2015). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior Research Methods*, 48(3), 936-949. <https://doi.org/10.3758/s13428-015-0619-7>
- Lipton, R., Bigal, M., Kolodner, K., Stewart, W., Liberman, J., & Steiner, T. (2003). The family impact of migraine: Population-based studies in the USA and UK. *Cephalalgia*, 23(6), 429-440. <https://doi.org/10.1046/j.1468-2982.2003.00543.x>
- Lipton, R., Buse, D., Adams, A., Varon, S., Fanning, F., & Reed, M. (2017). Family impact of migraine: Development of the Impact of Migraine on Partners and Adolescent Children (IMPAC) scale. *Headache: The Journal of Head and Face Pain*, 57(4), 570-585. <https://doi.org/10.1111/head.13028>
- Lipton, R., Dodick, D., Sadovsky, R., Kolodner, K., Endicott, J., Hettiarachchi, J., & Harrison, W. (2003). A self-administered screener for migraine in primary care: The ID Migraine™ validation study. *Neurology*, 61(3), 375-382. <https://doi.org/10.1212/01.WNL.0000078940.53438.83>
- Lipton, R., Hamelsky, S., Kolodner, K., Steiner, T., & Stewart, W. (2000). Migraine, quality of life, and depression: A population-based case-control study. *Neurology*, 55(5), 629-635. <https://doi.org/10.1212/WNL.55.5.629>
- Marôco, J. (2010). *Análise de equações estruturais: fundamentos teóricos, software e aplicações*. ReportNumber.
- Martin, B., Pathak, D., Sharfman, M., Adelman, J., Taylor, F., Kwong, W., & Jhingran, P. (2000). Validity and reliability of the Migraine-Specific Quality of Life Questionnaire (MSQ version 2.1). *Headache: The Journal of Head and Face Pain*, 40(3), 204-215. <https://doi.org/10.1046/j.1526-4610.2000.00030.x>
- Martínez-Fernández, A., Vega, A., Quintas, S., Heras, M., Téran, J., González, G., García, O., Mora, J., & Gago-Veiga, A. (2020). Psychosocial repercussion of the migraine: Is it a stigmatized disease? *Neurological Sciences*, 41(8), 2207-2213. <https://doi.org/10.1007/s10072-020-04332-6>
- Marzouk, M., & Seng, E. (2020). The impact of parental migraine on children. *Current Pain and Headache Reports*, 24(12), 1-5. <https://doi.org/10.1007/s11916-020-00915-2>
- Mattos, A., Souza, J., Filho, P., Jurno, M., & Velarde, L. (2017). ID-Migraine™ questionnaire and accurate diagnosis of migraine. *Arquivos de Neuro-Psiquiatria*, 75(7), 446-450. <https://doi.org/10.1590/0004-282X20170069>
- McAdams, H., Kaiser, E., Igdalova, A., Haggerty, E., Cucchiara, B., Brainard, D., & Aguirre, G. (2020). Selective amplification of ipRGC signals accounts for interictal photophobia in migraine. *Proceedings of the National Academy of Sciences*, 117(29), 17320-17329. <https://doi.org/10.1073/pnas.2007402117>
- McPhee, D., & Robinson, W. (2020). Couples living with chronic migraines: A phenomenological study. *Contemporary Family Therapy*, 42(3), 271-283. <https://doi.org/10.1007/s10591-019-09513-w>
- Monteiro, J. (2005). Enxaqueca: genética. *Dor*, 13(1), 14-16.
- Murray, C., & Lopez, A. (1996). *The global burden of disease: A comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020: Summary*. World Health Organization.
- Pereira-Monteiro, J. (1995). *Cefaleias: estudo epidemiológico e clínico numa população urbana*. Sociedade Portuguesa de Neurologia.
- Rizzoli, P. (2012). Acute and preventive treatment of migraine. *Continuum Lifelong Learning Neurology*, 18(4), 764-782. <https://doi.org/10.1212/01.CON.0000418641.45522.3b>
- Seidel, S., Beisteiner, R., Manecke, M., Aslan, T., & Wöber, C. (2017). Psychiatric comorbidities and photophobia in patients with migraine. *The Journal of Headache and Pain*, 18(1), 1-4. <https://doi.org/10.1186/s10194-017-0718-1>
- Smith, R. (1998). Impact of migraine on the family. *Headache: The Journal of Head and Face Pain*, 38(6), 423-426. <https://doi.org/10.1046/j.1526-4610.1998.3806423.x>
- Steiner, T., Stovner, L., Jensen, R., Uluduz, D., & Katsarava, Z. (2020). Migraine remains second among the world's causes of disability, and first among young women: Findings from GBD 2019. *The Journal of Headache and Pain*, 21(137), 1-4. <https://doi.org/10.1186/s10194-020-01208-0>
- Urbina, S. (2014). *Essentials of psychological testing* (2nd ed.). John Wiley & Sons Inc.
- Wang, X., San, Y., Sun, J., Zhou, H., Li, X., Zhang, Z., Zhao, Y., & Zhu, Y. (2015). Validation of the Chinese version of ID-Migraine in medical students and systematic review with meta-analysis concerning its diagnostic accuracy. *Journal of Oral & Facial Pain & Headache*, 29(3), 265-278. <https://doi.org/10.11607/ofph.1341>
- Ware, J., Kosinski, M., & Keller, S. (1996). A 12-item short-form health survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care*, 34(3), 220-233. <https://doi.org/10.1097/00005650-199603000-00003>