

# The disability profile of primary health care users may vary depending on the type of care and musculoskeletal pain characteristics

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## Research Article

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## Abstract

**Background:** One of the biggest current challenges for Primary Health Care is dealing with the increased demand for chronic diseases that have resulted in greater disabilities in the population.

**Objective:** To investigate the relationship between sociodemographic factors, musculoskeletal pain and its characteristics and the type of care in primary health care with self-reported disability.

**Methodology:** This is a cross-sectional study, interviewing individuals selected from spontaneous demand for health care in two types of care, the health center and family health. Disability was investigated using the World Health Organization Disability Assessment Schedule (WHODAS) 2.0 and characteristics of intensity, frequency, duration, number of pain sites and regions. Measures of association between predictors and disability were performed with non-parametric statistical tests, and non-parametric regression models were presented for pain characteristics and for the general population.

**Results:** 6.0% of the overall sample had severe level of disability, health center users had more self-reported disability than family health users ( $p < 0.001$ ). Fewer years of life ( $p = 0.034$ ) and lower per capita income quintile ( $p = 0.014$ ) were associated with greater disability. The most intense pain and in the greatest number of places increased the disability score by 1.8 (CI95%=1.0-2.6) and 6.3 (CI95%=0.1-12.2) points, respectively.

**Conclusion:** Users who had more disabilities sought out spontaneous demand care units of the health center type, had lower per capita income, presented musculoskeletal pain of worse intensity and in a greater number of places.

## Introduction:

Disability is a complex process that goes beyond physical limitations, it is not considered a stable condition and must be widely prevented and treated in primary health care settings<sup>1,2</sup>. It is recognized that as the number of chronic diseases increases, the level of disability also increases, in addition to resulting in greater use of social and health services and decreasing the quality of life of the subjects<sup>3,4</sup>. In this context, the assessment of disability must have an approach that is indifferent to the hierarchical order of possible health states based on medical standards, but rather to the impact of the disability context on functioning, considering the individual as a whole<sup>5,6</sup>.

It is estimated that there are around 978 million people in the world with moderate or severe disability<sup>7</sup>. The most recent global estimates present that, between 15.6% and 19.4% of the adult population, have experienced some form of disability<sup>8</sup>. In the population over 50 years of age, this prevalence ranges from 7.6–66.4% in low-income countries<sup>9</sup>.

Such data may provide a starting point for linking disability to use of services, however, its validity for predicting the need is unknown and may differ with place, time and person, since the relationships between disability and the use of services are bidirectional<sup>10</sup>. Thus, health policy makers need to define the priorities for the allocation of resources and, in this way, outline health policies that prevent the onset and worsening of disability, within the scope of primary health care<sup>2</sup>.

The type of health care, clinical aspects such as musculoskeletal pain and sociodemographic factors may be useful indicators for public policy makers to establish the functioning scenario based on users' demands. In this sense, the World Health Organization Disability Assessment Schedule (WHODAS) 2.0 instrument absolutely prioritizes the subjective perspective, precisely because it is a model of self-assessment of disability, which makes it advantageous in an environment with a great diversity of comorbidities. It is a simple and easily applicable instrument that may provide a screening for individuals at higher risk of developing more severe disabilities<sup>11,12</sup>.

## OBJECTIVE:

The objectives are to describe the disability profile of primary care users on spontaneous demand and to verify its association in relation to sociodemographic factors, type of care, musculoskeletal pain and its characteristics, in a region of São Paulo, Brazil.

## Methodology:

This is a cross-sectional study, in which participants were selected from the search for spontaneous demand in five primary health care units, and later grouped into two types of care (health center and family health), according to the criterion of having a majority of the reference team in the unit (Figure 1). Data collection took place in a location with 1,023,486<sup>13</sup> inhabitants known as the west zone in the city of São Paulo, which is the most populous metropolitan region in Brazil with a total of 12,252,023 inhabitants<sup>14</sup>.

Individuals included in the study were aged  $\geq 18$  years old and able to consent to their participation in writing. In addition, spontaneous demand was characterized, excluding pre-scheduled appointments, collection of clinical exams, simple exchange of prescriptions, withdrawal of exams and medical reports.

The study was approved by the Ethics Committee of the Faculty of Medicine of the University of São Paulo (protocol: 1.781.749) and by the Municipal Secretariat of São Paulo, Brazil (protocol: 1,819,729). All participants signed a consent form informing their participation in the study.

The sample was systematic using a sharing procedure proportional to the reference population of each unit. The sample size was 687 people, considering the lowest prevalence of disability in the general population of Brazil (32.8%)<sup>15</sup>, with a margin of error of 0.02% in 95% of possible samples and 20% of losses.

## DEPENDENT VARIABLE

Disability was investigated using the *WHO – Disability Assessment Schedule* instrument (WHODAS 2.0) 36 items version, an instrument directly based on the International Classification of Functioning, Disability and Health (ICF), which verifies the difficulties faced by respondents during the last 30 days. Scores were assigned to each of the 36 items – “none” (1), “mild” (2), moderate (3), severe (4) and extreme (5), which together resulted in a final score ranging from 0 (no disability) to 100 (maximum disability)<sup>16</sup>.

Missing data were handled as suggested in the WHODAS 2.0<sup>16</sup> manual, where as per the recommended imputation process; the missing item value was replaced by a random value from a similarly matched answered item.

## INDEPENDENT VARIABLES

The type of care in primary care (health center and family health), sociodemographic data: age in years, gender, education, work, per capita income, religion, marital status, type of occupation and skin color. The pain variable was defined by the presence of musculoskeletal pain at the time of spontaneous demand, as well as its characteristics such as intensity<sup>17</sup>, frequency, duration<sup>18</sup>, region<sup>19</sup> and number of pain sites<sup>20</sup>.

## DATA ANALYSIS

It was performed using the statistical package Stata version 16.0. Descriptive statistics were used based on the ICF qualifiers: absent (0–4.9), mild (5-24.9), moderate (25-49.9) and severe (50-95.9), there were no individuals in the sample with extreme/complete disability. In order to characterize the sample by disability levels, the following predictors were used: type of care, gender, age, education, per capita income, marital status, work and type of occupation, religion, skin color, musculoskeletal pain and its characteristics.

For categorically distributed variables, measures of absolute (n) and relative (%) frequency were presented, and for variables distributed continuously, measures of average and standard deviation (SD) or median and interquartile range (IQR). The prevalence of disability and musculoskeletal pain was stipulated with the respective confidence intervals.

For inferential statistics, the dependent variable was used in its continuous distribution. Nonparametric tests were performed to verify measures of association in the bivariate analyses. Between disability and explanatory variables with more than two categories (categorical age, occupation, education, categorical per capita income, religion, frequency, region and number of pain sites), the Kruskal Wallis and post hoc Dunn test were used. For dichotomous explanatory variables (assistance care, gender, work, marital status, skin color, musculoskeletal pain and pain duration) the Mann-Whitney U tests were used. And to verify the relationship between disability and continuous variables (continuous age, continuous per capita income and pain intensity) Spearman's correlation coefficients were calculated, whose result ranges from -1 to 1 and the suggested classification indicates: 0.1 to 0.29 (weak), 0.30 to 0.49 (moderate) and greater than or equal to 0.50 (strong)<sup>21</sup>. In the multivariate analysis, the non-parametric Kernel regression model was applied, estimating the weight of the independent variables in the adjusted disability after bivariate analysis ( $p < 0.20$ ).

Regression models were built for the total study sample and according to pain characteristics. For each model, a *bootstrap* of 1000 repetitions was used to calculate 95% CIs, deriving the average disability as a function of the explanatory variables. All independent variables were tested for multicollinearity with tolerance for entry into the model, Variance Inflation Factor (VIF) values less than 5<sup>22</sup>. The level of significance was previously set at  $\alpha = 0.05$  and the confidence interval at 95% (CI<sub>95%</sub>).

## Results:

Of the 668 individuals who participated in the survey, 498 were from units of the health center type and 170 of the family health type. Figure 2 presents the flowchart with the general sample of the study, percentage of loss by primary health care units and the sample by type of care.

Table 1 shows that the median score of WHODAS 2.0 was 15.5 (IQR=5.7 – 29.2). Most users were female (72.6%), with an average age of 45.7 years (SD=16.9) and average per capita income of R\$1155.00, equivalent to approximately USD 222.00. Among those with severe disability, 70% were women with an average age of 46.5 years (SD=14.6), who sought care on a spontaneous demand in a health center (90%).

Of the family health users, 65.3% (CI<sub>95%</sub> 57.9% – 72.0%) had some level of disability, whereas individuals from the health center, the percentage was 80.9% (CI<sub>95%</sub> 77.2% – 84.1%). The prevalence of severe disability was also higher in the type of care at the health center, 7.2% (CI<sub>95%</sub> 5.6% – 10.9%), compared to the family health type, 2.3% (CI<sub>95%</sub> 0.9% – 5.9%).

Regarding the variables that were associated with disability, family health users had less disability ( $p < 0.001$ ), as well as Catholics compared to not having a religion ( $p = 0.0328$ ) and continuous per capita income, which had an inverse relationship with self-reported disability ( $p = 0.0068$ ). Having musculoskeletal pain was also associated with greater disability ( $p < 0.001$ ). The overall prevalence of musculoskeletal pain in the study was 59% (CI<sub>95%</sub> 55.2% – 62.6%).

The average intensity of musculoskeletal pain in the study was 5.1 (SD=3.0). Most of the sample had pain only reported in the spine region (37.1%), pain frequency 6-7 days a week (66%), pain lasting more than 6 months (65.7%) and only one reported pain site (58.4%). Table 2 presents the most intense and frequent pain in different regions and in a greater number of places were the characteristics of pain that were associated with greater disability.

Table 3 presents the results of the multivariate nonparametric regression analysis of the overall sample (n=668). The variables age, type of care, per capita income, religion and musculoskeletal pain remained in the final model. Predictors explained 15.3% of the variance in this model. As the presence of

musculoskeletal pain is the strongest variable to attribute greater disability, adding 11.2 points to the WHODAS 2.0 score. Furthermore, the type of health care center also appeared as a predictor of increased disability, while being older and having higher per capita income decreased the disability score.

Table 4 presents the results of the multivariate nonparametric regression analysis in the sample with musculoskeletal pain (n=394). Pain characteristics variables were progressively inserted as a way to verify the best fit for the final model. All variables had VIF < 5, yet regions and number of pain sites presented a strong correlation (r=0.72) with each other, indicating a possible collinearity between them. The correlation coefficients between the other variables were <0.38. The choice of permanence of the variable number of pain sites in the final model was due to the lowest p value presented in model 1. Pain intensity was the main characteristic of pain associated with disability, remaining significant in all regression model adjustments.

## Discussion:

The results of this study suggest that some predictors are related to users' self-reported disability due to spontaneous demand in primary health care. It is a relevant research for having the innovative perspective of studying the association of the type of care offered with the incapacity profile of users of the health system. In the general sample, users of family health units had less self-reported disability compared to those at the health center. It is understood that the model of organization of the family health type directs care centered on the subject, considering the degree of complexity required, and that, therefore, having a reference team for the users' demands, rather than professionals alternating in care, may have been a contributing factor to this finding.

In the study by Montoro et al. (2020)<sup>2</sup>, it was found that the predictors female gender, age  $\geq 80$  years, having  $\geq 2$  morbidities and having a self-perception of poor health status were routinely inserted as warning signs by the family health teams to track disabilities with the possibility of aggravation. In the study by Hustoft et al. (2019)<sup>23</sup>, the longitudinality of care was a preponderant factor for individuals to report a lower level of disability in social participation and better self-perception of their health status. Thus, it is expected that effectively coordinated teams have an impact on the continuity of care and that patients experience better care on aspects of functioning when there are relational attitudes from the entire team, as is the case in the family health strategy<sup>24</sup>.

Regarding the prevalence of disability, 65.3% of family health users had some level of disability, compared to the prevalence of 80.9% in health centers. This finding is similar to that found by Montoro et al. (2020)<sup>2</sup>, who, in the same city of São Paulo, presented a prevalence of general disability of 56.4% in basic units affiliated to family health. However, it is a value well above the one found in the study by Naidoo et al. (2017)<sup>25</sup>, which found a prevalence of 38.9% in individuals aged 18 to 64 years with scores above 0 on the continuous scale of the WHODAS 2.0. These differences may be due to the location of the area and other context factors, as in the latter, the survey was carried out by clusters in households; so it is likely that the prevalence of disability is lower in a sample of the general population than in a sample that seeks care for a clinical care<sup>26,27</sup>. With regard to the severe level of disability, this study had a prevalence of 6.0% in the general sample, 7.2% in health centers and 2.3% in family health. In comparison with other studies, disability in a more general context was verified in the study by Salinas-Rodríguez (2020)<sup>1</sup>, which found 8.0% of severe disability in elderly people from low- and middle-income countries. In the context of samples with specific conditions, Karami et al. (2019)<sup>28</sup> evaluated individuals with physical and intellectual disabilities and presented 28.9% of severe disability in their study. It is likely that those with more severe disabilities are less likely to participate in studies in a broader context<sup>29</sup>.

With regard to the prevalence of musculoskeletal pain, 59.0% reported having pain at the time of seeking care in primary health care units. This study presented an association between musculoskeletal pain and disability, so that answering "yes" to the presence of musculoskeletal pain increased 11.2 points in the continuous score of the WHODAS 2.0. The positive association between pain and self-reported disability has been discussed in several articles<sup>30,31,32</sup>. Although this relationship is not always observed in a proportional way, there may be functional improvement without monitoring the pain reduction and vice versa<sup>33,34</sup>.

In the multivariate evaluation of pain characteristics, only the intensity and number of pain sites remained significant in the final model. Despite the understanding that the characteristics of greater pain severity (worse intensity, more frequent, in different regions and more places) increase disability, when these are analyzed together, intensity becomes the main expression associated with the individual's disability. Users tend to refer more often to pain intensity than other characteristics when explaining how pain interferes with their daily life. Due to the lack of objective physical evidence of pain, the subject uses this characteristic to justify the existence of their pain to the other, in addition to adopting it as a mechanism to receive due attention and treatment, with a behavior related to medical and social expectations of pain related to the disease<sup>35</sup>. Silva et al. (2013)<sup>36</sup> reported in their study that pain intensity, general and localized, had greater correlations with WHODAS 2.0 scores than other characteristics. For the authors, greater comprehensiveness of care, opposing fragmentation, can be attributed to the management of intensity, in the understanding that intervening in the reduction of global pain intensity is a better strategy than managing it in specific locations.

In addition to intensity, the number of pain sites was also relevant in this analysis. The dose-response effect with incapacity has also been verified in some studies<sup>12,20,36</sup> indicating that multiple pain sites should be given greater attention in care to prevent greater severity of incapacity.

Per capita income was an important predictor of self-reported disability. This is in line with a previous study where WHODAS 2.0 scores were higher for lower-income participants<sup>37</sup>. Similar results were also found by Waterhouse et al. (2017)<sup>38</sup>, which revealed that the poorest income quintile was associated with severe disability and the number of chronic diseases reported. In general, individuals with generalized disability are more likely to occupy positions of low socioeconomic status, including not working, or working with low pay, having a lower educational level and lower family income<sup>39</sup>.

Age was also a factor associated with disability, so that having fewer years of life decreased the disability score when the multivariate regression model was analyzed, although this difference was not significant (p>0.05) in the bivariate analysis of the general sample. These results diverged in most studies that assessed disability in the elderly<sup>29,37,38</sup>. However, a possible explanation is that in the primary health care setting, older individuals with more severe difficulties sought the units by spontaneous demand less than those individuals who were younger with the same degrees of perceived difficulty, which could suggest a

worse access for elderly people with higher levels of disability. Another hypothesis is that these older users may have developed adaptation mechanisms that affect the perception of functioning, so that they may have faced their limitations in activities and participation as a normal consequence of aging. Anyway, more data would be needed to confirm these hypotheses.

In general, care and access to health must be guaranteed by the different types of care in primary health care and that health teams must adjust the most frequent demands with those with greater impact, dealing with phenomena of functioning, dependence, independence, illness and health, in an approach with the main guides of the biopsychosocial model of health.

## STUDY IMPLICATIONS AND LIMITATIONS

The results suggest that the subjects' lower report of disability is indicative of better longitudinal care with the health service, so that the units that mostly have the family health reference team may provide greater surveillance of the conditions that most contribute to functional deterioration in their territory. In addition, understanding the characteristics of pain in this population can be useful to define assertive approaches to pain care that promote an improvement in disability and quality of life. Future studies can explore the relationship of assistential care as a causal factor for the functioning profile in a broader population.

This study has some limitations. First, it does not fully explore the disability profile based on the type of care in primary health care, as it was necessary for users to go to the collection units, therefore, it is possible that users with more severe disabilities were not interviewed. Another issue is the memory bias, so that the participants, in addition to reporting the intensity of pain at the time, were also asked to report it during the crisis, which did not always coincide with the pain the user had at the time of the interview. Finally, in this study, we did not verify the comorbidities of users in spontaneous demand, neither in order to account for them nor qualitatively classify them as possible predictors associated with disability. It is possible that these data could outline a better scenario of the profile of users who most seek care in primary health care, from the point of view of the health conditions that most interfere with self-report of disability.

### Conclusion:

Users of health centers, with lower per capita income, with fewer years of life and with the presence of musculoskeletal pain had more self-reported disability. Among those with musculoskeletal pain, it was found that pain of a more intense nature and in a greater number of places in the body was associated with worse severity in the continuous disability score. It is noteworthy that the assistance care of primary health care was an important predictor of the level of disability; this suggests that family health units, which are focused on the longitudinality of care, may be the best strategy to timely address musculoskeletal pain care and improve daily disability.

### Declarations:

This study is in accordance with the guidelines and regulations of the Declaration of Helsinki. Evaluated and approved by the Ethics Committees of the Faculty of Medicine of the University of São Paulo (protocol: 1,781,749) and of the Municipal Secretariat of São Paulo, Brazil (protocol: 1,819,729).

Declare that informed consent was obtained from all participants

Consent for publication: NOT APPLICABLE

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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All the undersigned authors actively participated in the study. FAC collected the data, analyzed and wrote part of the article. ABG collected the survey data and analyzed and described part of the results. RAC helped in the elaboration of the research design and contributed to the writing of the discussion on musculoskeletal pain. TGF participated in the methodological design, construction of results and elaboration of the discussion on the type of health care. SSC participated in the methodological design, construction of results and elaboration of the discussion on Disability. ACBS participated in data collection, elaboration of the methodological design, results and discussion and review of the manuscript. All authors read and approved the final manuscript.

The authors declare that they have no competing interests

## AVAILABILITY OF DATA AND MATERIALS

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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## Tables:

Due to technical limitations, Tables 1,2,3 and 4 are only available as a download in the Supplemental Files section.

## Figures

Type of assistance care	Units	Number of people registered	Types of teams available	Family Health Reference Team
	Mixed (family health + health center)	20,000 registered residents	Family health, medical/nursing and rehabilitation teams	Partial 60%
<b>Family Health</b>	Family Health	15,641 registered residents	Family health and rehabilitation teams	Yes 100%
	Programmatic	24,766 registered residents	Care teams and professionals linked to teaching (medical/nursing and rehabilitation)	No
<b>Health Center</b>	Integral	52,369 registered residents and local workers	Family health, medical/nursing and rehabilitation teams	Partial 23%
	Traditional	31,208 registered residents	Health care/nursing teams	No

**Legend of the reference name of each unit:** mixed unit= UBS São Remo; family health unit= UBS Vila Dalva; programmatic unit= Butantã School Health Center; integral unit= UBS Jd. Edite and traditional unit= UBS Caxingui.

Figure 1

Types of assistance care in primary health care. Legend of the reference name of each unit: mixed unit= UBS São Remo; family health unit= UBS Vila Dalva; programmatic unit= Butantã School Health Center; integral unit= UBS Jd. Edite and traditional unit= UBS Caxingui.

Figure 2

Flowchart of collection by primary health care units \* Loss due to limitations of the collection process, however, a sufficiently large sample number to meet the research objectives.

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Table1.docx](#)
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