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Research Article

Mental Health Status and Life Satisfaction in Women Aged 45 to 64 with Hip Pain: Preliminary Results

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ABSTRACT

Background: Hip pain contributes to a reduction in physical function and mobility for the activities of daily living, especially in women in the aging process. Individuals with hip-pain are also affected by psychological distress, which in turn negatively impacts functionality and quality of life or satisfaction with life.

Objective: To assess the functional status of the lower limbs, psychological distress and life satisfaction in women aged 45 to 64 with different intensities of hip pain.

Methods: From a cross-sectional study, twenty-one (21) women aged 45 to 64 were recruited voluntarily and assessed by: Sociodemographic data, clinical and validated questionnaires such as the Lequesne Pain Index, Lower Extremity Functional Scale (LEFS), psychological distress and life satisfaction. Women were further classified into 2 groups using the Lequesne Pain Index (PI): Low-PI (score ≤ 9; n=14) and Strong-PI (score ≥ 10; n=7) for subsequent analyses.

Results: Strong-PI group reported significant ($p<0.001$) poor lower-limb functionality (LEFS) as compared to Low-PI (effect size; g=2.59). No significant difference was observed between the groups for psychological distress and life satisfaction.

Conclusion: Although hip-pain (Strong-PI) impacts the perception of lower limb function, it was not associated with psychological distress or life satisfaction in women aged 45 to 64.

Keywords: Hip pain; Functional status; Mental health; Life satisfaction

INTRODUCTION

Hip pain contributes to the reduction in physical function and ability in activities of daily living, especially for women [1-5]. The development of hip pain is multifactorial, affected by pathological aspects such as hip morphology, arthrosis and musculotendinous injury, as well as by a Body Mass Index (BMI) that is greater than 30 kg/m^2, comorbidities, and mental health [1,6-7].

The pain experience reported by participants is often influenced by physiological changes, as well as by psychological factors (depression, stress, and catastrophizing). Other factors associated with demographic characteristics such as age (increase with the age until the seventh decade of life, and then either a plateau or slight decline into very advanced age), sex (higher in females than males) and comorbidities from a chronic condition [1,6-9].

The aging process may have an even greater impact on the pain experience [1,6-9]. Epidemiological research suggests that pain is most common during late middle age (55-65 years) and continues with approximately the same prevalence into old age (65+), regardless of the anatomical site or pathogenic cause of the pain. The only exception seems to be pain associated with degenerative joint disease, such as osteoarthritis, that shows an exponential increase until at least 90 years of age [6-9].

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Specifically, one psychological factor which has received much attention is the individual's satisfaction with life [10,11]. Life satisfaction is a concept related to how individuals positively evaluate their quality of life, over time [10,11]. The experience of pain, particularly in chronic conditions (>3 months pain-related), has a strong emotional component, which traditional biomedical models that focus on structural and biomechanical abnormalities cannot sufficiently explain, and associates it with disability [12-16]. In this case, the biopsychosocial model [12-16] provides a better understanding of individual pain, because it includes physical, psychological and social aspects [12-16]. This model has been frequently used in the last decades and is efficient to obtain a global portrait of an individual for care management [12-14]. Another aspect of this model includes the individual's subjective perception of well-being and satisfaction of life [10-14].

Psychological aspects, such as negative affect, depressive symptoms, anxiety, and maladaptive coping (e.g., catastrophizing) are generally considered to be risk factors that influence pain perception, leading to its exacerbation, as in the case of chronic hip pain, impacting on functionality [1,3,6,7]. A comprehensive approach may include the identification, assessment, and management of psychological distress [14,17]. Attention to these psychological components may represent a clinically-important target for improved overall health [7,12].

Thus, the purpose of this study was to assess and determine the association between the functional status of the lower limbs, psychological distress manifestations and life satisfaction in women aged 45 to 64 with different levels of hip pain intensities. We expected to notice an impact of hip pain for all the variables investigated.

MATERIALS AND METHODS

Study design and sample

This consisted in a cross-sectional descriptive study that was performed between October 2018 and June 2019 at the Université du Québec à Chicoutimi (Quebec, QC, Canada) in the Clinique universitaire de kinésiologie and BioNR Laboratory. A total of twenty-one (21) women participated voluntarily by convenience. This study is part of a large research project on women with hip pain in Saguenay, QC, Canada. The first results, including postural control and physical capacity from the sample, have been published by our research team [18]. This project was approved by the Ethics Committee (CER 2019-181, 602.610.01) and all participants signed a consent form related to the experimental protocol of the project. The inclusion criteria were: a) Being a woman; b) of Caucasian origin and c) aged between 45 and 64. Participants were excluded if they: a) Suffered from a cardiovascular, pulmonary or musculoskeletal disorder that could interfere with the safe performance of physical evaluation; b) hip arthroplasty or c) a self-reported diagnosis of knee osteoarthritis [18].

Procedure

The anthropometric measurements (BMI and waist circumference) were collected in person by the author (PB) at the Clinique Universitaire de kinésiologie or BioNR Laboratory [18]. The participants provided the following data through online questionnaires on Google Forms: a) Sociodemographic data (Age, occupation, education Level, household income, matrimonial status); b) Algo-functional index of severity according to Lequesne [19,20]; c) Functional status of the lower limbs by the French version of the Lower Extremity Functional Scale (LEFS) [21]; d) Mental health status by Psychological Distress Manifestations Measurement Scale (PDMMS) [22] and e) Satisfaction of life by The Satisfaction with Life Scale (SWLS) [23].

Anthropometric measurements

BMI: The BMI was calculated to assess body fat. This measurement provides a more accurate measure of total fat mass than body weight assessment alone [18,24]. The calculation was performed according to the National Institutes of Health protocol by dividing weight in kilograms by height in square meters (kg/m^2) [18,25].

Waist circumference: Waist circumference measurement is another accurate method of assessing the level of health risk associated with obesity or overweight [18,26]. Waist circumference measurement was taken according to the recommendations of the National Institutes of Health [18,25].

Clinical questionnaires

Pain measurement: The severity of hip pain (ex.: As used for osteoarthritis disorder) was assessed by Lequesne's Algo-functional Index [19,20] which was validated in its French version. The reliability of the test-retest was also reported as excellent for this scale using an Interclass Correlation Coefficient (ICC=0.95) [20]. Ten (10) items of the questionnaire are associated with a score from 0 to 6 related to hip pain. Two (2) additional items are requested, the need to use 1 or 2 cane(s) or crutch (es) for walking, which adds +1 or +2 to the score. The final score ranges from 0 (no pain or modest impairment) to 24 (maximum pain or significant impairment) [19,20]. According to the Lequesne Pain Index (PI), participants were classified into 2 groups: (1) Low-PI (low pain, score ≤ 9) and (2) Strong-PI (strong pain, score ≥ 10) [18].

Functionality measurement: The functional status of the lower limbs was measured by the French version of the Lower Extremity Functional Scale (LEFS). The translated version of the instrument has been validated according to the methodology of cross-cultural validation of questionnaires by Vallerand (Cronbach's alpha=0.93 to 0.96) [21]. This questionnaire includes 20 items which, in turn, are subdivided into 4 groups. These groups consist of activities with increasing physical demands. The activity questions range from walking between rooms in the house to running on uneven ground. The responses measure the level of difficulty experienced in common activities. A 5-point Likert type scale ranging from 0 (extremely difficult or unable to perform the activity) to 4 (no difficulty) is used. For each question, 0 to 4 points can be earned, so a total of 80 points can be earned, indicating the maximum function of the lower limbs [21].

Psychological distress measurement: Mental health status was assessed by the Psychological Distress Manifestations Measure Scale (PDMMS) and is a valid questionnaire designed in French (Cronbach's alpha=0.93) [22]. This scale is self-administered and is composed of 23 items, each statement is measured on a five-point Likert-type scale, ranging from 1 (never) to 5 (almost always). The questionnaire evaluates the dimensions of self-deprecation (7 items), irritability-aggressiveness (5 items), anxiety-depression (5 items) and social disengagement (6 items). A high total score suggests that the participant has high psychological distress [22,27].

According to Poulin et al. the total score on PDMMS is constructed by summing the raw scores on the frequency scale (from 1 "never"

to 5 "almost always") and then reducing it to a scale from 0 to 100. The distribution of respondents according to the value on the scale is subdivided into two categories, corresponding to the low or high level of psychological distress manifestations [27].

Life satisfaction measurement: Satisfaction with life will be assessed by the French version of the Satisfaction with Life Scale (SWLS). The translated version of the tool has been validated [23]. The psychometric properties have been evaluated in older people in two studies (Cronbach's Alpha 0.81-0.82). A seven-point Likert-type scale is used, ranging from 1 (strongly disagree) to 7 (strongly agree). The respondent indicates the extent to which he/she agrees or disagrees with each statement. The total score can range from 5 to 35. A high score indicates that the participant is generally satisfied with his or her life. A low score suggests dissatisfaction with the quality of life [23].

Data analysis

To describe the sample profile of two groups by the Lequesne PI (Low-PI; Strong-PI), variables were described by means and standard deviation. The Shapiro-Wilk test was first used to evaluate the normality of the variables and determine which tests would be used. The student's t-test was used to compare the two groups (Low-PI *vs.* Strong-PI). For functional and mental health status, the two groups were compared by an independent Student t-test. The magnitude of the differences between the groups, the percentage of clinical differences, as well as the effect size were calculated according to Glass and Hopkins, using Hedge's coefficient g [28] as: Small (g=0.20-0.49), moderate (g=0.50-0.79) and large (g ≥ 0.80) based on size sample [18]. Pearson correlations between functional (status of the lower limbs) and mental health status (psychological distress manifestations and satisfaction with life) were performed as small (0.1-0.30), moderate (0.30-0.50) and strong (>0.50) [18]. All statistical analyses were performed with a significant alpha risk of less than 0.05. IBM SPSS version 28.0 software (IBM, Armonk, NY, USA).

RESULTS

Anthropometric (BMI and waist circumference), functional status of the lower limbs, psychological distress manifestations, satisfaction of life and sociodemographic (age, occupation, education level, household income, matrimonial status) data from two groups Low-PI *vs.* Strong-PI are presented in Table 1. In general, both groups are comparable for variables such as BMI, waist circumference and functional status of the lower limbs (Table 1).

The results for group differences related to hip pain (Low-PI *vs.* Strong-PI) and associations between lower-extremity function, psychological distress and life satisfaction of life are presented in Table 2. The group of Strong-PI reported a poor score (27% higher) of the functional status of the lower limbs, as compared to Low-PI ($p<0.001$). A significant ($p<0.001$) association was observed between the pain index (Strong-PI) and functional status of the lower limbs with a strong effect size (g=2.59; Table 2). However, no significant differences between groups were reported for psychological distress manifestations and satisfaction of life.

DISCUSSION

The purpose of this study was to assess and determine the association between the functional status of the lower limbs, psychological distress manifestations and life satisfaction in women aged 45 to 64 with different levels of hip pain intensities. Our hypothesis was at least supported by a significant effect of hip-pain related to the lower extremity functional scale. No effect was observed for psychological distress and life satisfaction in our sample, which suggests that there might be a protecting effect in our participants, i.e., women aged 45 to 64.

Previous studies have shown that pain intensity contributes considerably to disability [1,2,18,29-31]. Fujiwara et al. [31] investigated several factors, physical and psychological, that could be associated with disability. Their results revealed that age, severity, pain in lumbar and lower-limb regions, depression, anxiety, catastrophizing, and no habit of walking or working out were the factors that are most associated with disability in individuals aged ≥ 50 years, with a median age of 73 years.

In addition, the strength of association on disability variables was more obvious for depression (Odds Ratio (OR), 3.62; 95% Confidence Interval (CI), 1.92-6.82, $P<0.001$), pain in lumbar and in lower-limb regions (OR, 3.10; 95%CI, 1.83-5.24; $P<0.001$) and catastrophizing (OR, 2.94; 95%CI, 1.88-4.61; $P<0.001$). These results support the importance of these factors to elaborate preventive actions against chronic pain conditions and disability. In the present study, our sample was characterized as having a low level of psychological distress manifestations and average satisfaction of life. This profile could explain at least one part of our findings. Overall, pain impacts functionality [1,2,18,29-31]. In our study, this phenomenon was not different. The LEFS is a scale developed by Binkley et al. [32] as a participant-reported measure to examine functional status in the presence of lower extremity musculoskeletal problems [32,33].

Evidence from a systematic review about the measurement properties of the LEFS with 27 studies of which 18 achieved a very good to excellent level of methodological quality, Mehta et al. [33] demonstrated that LEFS scores have excellent test-retest reliability (intraclass correlation coefficients ranging from 0.85 to 0.99) and an excellent responsiveness, as suggested by consistently high effect sizes (greater than 0.8) in participants with different lower extremity conditions [33].

Although this scale is subjective and from the perspective of the individuals with pain, in the present study, this tool was very sensitive (strong effect size) to determine the differences in lower-limb functionality between two groups (Strong-PI *vs.* Low-PI); with a 27% difference related to women reporting higher pain intensities (Table 2). This highlights the importance of determining the clinical significance of the results, not only as a statistical probability, but also from changes between LEFS groups associated to a strong effect size [34]. The Strong-PI group reported a higher BMI (mean 34.4 kg/m^2) compared to the Low-PI group (mean 27.44 kg/m^2) (Table 1).

On the other hand, psychological distress and satisfaction with life for the women aged 45 to 64 did not differ in both groups with pain (Low-PI and Strong-PI). In addition, no significant association was observed (Table 2). These results are contrary to some evidence from the literature for chronic pain conditions and psychosocial aspects [6,7,12-16,35]. From the biopsychosocial model, it was reported that individuals with exacerbation of pain have more depression, stress, anxiety, poor quality of life and, consequently, a decrease in mobility and an onset of disability [1-3,6,7,9,12-16,29-31,35]. In the present study, we used two clinical questionnaires to determine mental health status, the PDMMS [22,27] for psychological distress

Table 1: Characteristics of the sample regarding sociodemographic data, anthropometric variables, and functional status of the lower limbs, psychological distress manifestations and satisfaction of life for both groups from the Lequesne PI score (Low-PI *vs.* Strong-PI).

Variables	Low-PI (n=14)	Strong-PI (n=7)	p-Value
Age (years)	56.6 ± 4.7	57.6 ± 5.3	0.66
BMI (kg/m^2)	27.4 ± 4.3	34.4 ± 9.4	0.11
Waist circumference (cm)	98.0 ± 9.9	108.1 ± 13.5	0.39
Functional status of the lower limbs	74.4 ± 8.6	47.0 ± 12.8	<0.001
Psychological Distress Manifestations	39.5 ± 12.5	40.0 ± 10.3	0.92
Satisfaction of life	23.1 ± 4.8	22.1 ± 7.5	0.71
Occupation			
Remunerated job	8 (57.1%)	3 (49.2%)	0.44
Self-employed	0 (0.0%)	1 (14.3%)	
Housewife	1 (7.1%)	0 (0.0%)	
Retired	5 (35.7%)	2 (28.6%)	
Disabled	0 (0.0%)	1 (14.3%)	
Education level			
Secondary	1 (7.1%)	2 (28.6%)	0.57
Professional	4 (28.6%)	0 (0.0)	
College	2 (14.3%)	1 (14.3%)	
Bachelor's	5 (35.7%)	3 (42.9%)	
Graduate and more	2 (14.3%)	1 (14.3%)	
Household income (CAN$)			
<15,000$	0 (0.0%)	1 (14.3%)	0.06
15,000 to 34,999$	3 (30.0%)	0 (0.0%)	
35,000 to 79,999$	1 (10.0%)	4 (57.1%)	
≥80,000$	6 (60.0%)	2 (28.6%)	
Matrimonial status			
Single	1 (7.1%)	2 (28.6%)	0.7
Married	8 (57.1%)	4 (57.1%)	
Common-law partner	4 (28.6%)	1 (14.3%)	
Divorced	1 (7.1%)	0 (0.0%)	

Note: *Age, BMI, functional status of the lower limbs, psychological distress manifestations and satisfaction of life are expressed as mean ± SD (standard derivation). Other data are expressed as n (%). PI: Pain Index; BMI: Body Mass Index.

Table 2: Results from the impact of hip-pain, based Lequesne PI score (Low-PI *vs.* Strong-PI) on the functional status of the lower limbs, psychological distress manifestations, satisfaction of life and the relationship between these varibles (coefficient correlations).

Variable	Low-PI (n=14)	Strong-PI (n=7)	Differences (%)	Hedge's g	Pearson's r (p Value)
	Mean ± SD	Mean ± SD			
Functional status of the lower limbs	74.43 ± 8.62	47.00 ± 12.84	27.42%	2.59	-0.8 (<0.001*)
Psychological distress manifestations	39.54 ± 12.56	40.09 ± 10.83	1.01%	-0.44	0.02 (0.92)
Satisfaction with life	23.15 ± 4.81	22.14 ± 7.53	-0.54%	0.16	-0.08 (0.71)

Note: *Significant group differences=p<0.001, (Student t-test). Pearson's coefficient correlations between pain measure and functional status of the lower limbs, psychological distress, and satisfaction with life. Significant correlations between these variables are illustrated for p<0.05.

manifestations and the SWLS [23] for satisfaction with life.

According to Poulin et al. [27] study about the clinical validity of the PDMMS, psychological distress scales are frequently used in national epidemiological surveys to monitor mental health status and predict demands on healthcare services. These scales have the advantage of being easy to administer and inexpensive to use [27]. The PDMMS showed that high psychological distress is closely associated with a mental disorder (OR=5.94). However, most people in the high psychological distress category do not have known mental disorders, confirming that, like other psychological distress scales, the PDMMS is not a diagnostic tool [27].

In our study, the participants had similar mean scores on the PDMMS total score, indicating a low level of psychological distress, as the total score on PDMMS is constructed by summing the raw scores on the frequency scale and then reducing it to a scale from 0 to 100 [27]. The Strong-PI group reported a mean of 39.5 and the Low-PI group a mean of 40.0 (Table 1).

To date, no studies using the PDMMS with a similar purpose to our study have been found. This is thus a gap to be explored, i.e., the use of the PDMMS in people with different pain intensities, to identify psychological distress manifestations, over time.

Regarding life satisfaction, participants also had similar mean scores on the SWLS, indicating an average satisfaction with life; the strong PI group reported a mean of 22.1 and the low PI group a mean of 23.1. The total score can range from 5 to 35. A high score indicates a high level of satisfaction, being generally satisfied with life [23,36]. A score of 20 represents the neutral point on the scale (the point at which a respondent is neither satisfied nor dissatisfied), a score of 5 to 9 indicates extreme dissatisfaction with life [36].

The SWLS is a short instrument that looks at the extent to which a person feels satisfied with their life, in general. It is considered to be one of the most popular scales for measuring this construct [23,36]. The SWLS has been translated into several languages, used in a variety of cultural contexts, with a variety of sub-populations (students, employees, seniors, people with disabilities, institutionalized people). The psychometric properties have been evaluated in older people in two studies (Cronbach's Alpha 0.81-0.82) [36].

In a systematic review and a meta-analysis on well-being and its relationship between satisfaction and motivation among individuals over the age of 50, Tang et al. [37] showed that the results of studies (mainly from the United States, Canada, and Europe) are relatively congruent with the idea that the basic psychological needs of satisfaction and motivation are positively associated with positive indicators of well-being (meaning of life, life satisfaction, self-esteem, etc.) and negatively associated with negative indicators of well-being (depression, apathy, etc.) [37].

We observed low levels of affection for these variables which may have contributed to the lack of association between pain intensity and mental health status. Another explanation could be associated with the sociodemographic status from our sample. Or, social support and good financial condition (Table 1) may be protective factors for good long-term life satisfaction, mitigating the negative effects of chronic pain to increase resilience [7,10-13,15,35]. Furthermore, this situation can be an important mediator on adaptability to pain in adults [15].

Social and interpersonal processes, such as low socioeconomic status (including education, income, and occupation) are also causative factors in unfavourable pain outcomes [15,38]. Studies have observed higher incidence rates of hip and knee pain in individuals with: a) Osteoarthritis (≥ 75 years of age); b) obese; c) a previous history of hip and knee injury and disability, and d) an annual income of less than $15,000 [13,32-33]. In our study, the women were young (the strong PI group age mean 57.6 and the low PI group, 56.6), had a good economic status, and low level of psychological distress, which explains this phenomenon.

Finally, some limitations of our study should be pointed out. First, the convenience sample may not be generalized to all people with hip pain. A small number of individuals were included, so observations should be interpreted with caution. Second, there is a potential for bias because the data were collected based on self-reported online questionnaires, which perhaps led to underreporting of pain intensity and mental health status. In addition, pain exacerbation may be involved in many other aspects, as pain is multidimensional [16,39].

CONCLUSION

Our results were generalized only for women, and new studies would include men and older people. Additional studies are needed to identify factors such as catastrophizing, anxiety and depression, and to understand the impact of psychosocial function in the relationship between pain intensity and mental health status in individuals with hip pain, over time, and for both sexes.

As a perspective, this study contributes to a growing body of evidence concerning the influence of pain intensity and mental health status among women with hip pain, and encourages the use of PDMMS in future studies with a larger sample size to represent community-dwelling people, and to improve on the generalization of findings. So far, the use of this scale for this purpose is unknown, which can fill a gap in the study of pain intensity and psychological distress. This shows the importance of conducting new longitudinal studies and investigating this relationship, over time.

Hip pain intensity negatively impacted lower limb physical functional status in women aged 45 to 64, but not psychological distress, nor satisfaction of life.

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