

Global financial crisis and musculoskeletal pain: systematic review

Crise financeira mundial e dores musculoesqueléticas: revisão sistemática

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DOI 10.5935/2595-0118.20230047-en

ABSTRACT

BACKGROUND AND OBJECTIVES: In recent history, major catastrophes are followed by economic crisis, which are commonly succeeded by high levels of psychological stress related to financial hardships. The relationship between this financial stress (FS) and musculoskeletal pain (MP) is not elucidated. The aim of this systematic review was to critically evaluate the evidence of the relationship between these financial difficulties and MP.

METHODS: A comprehensive search was conducted on the following databases: Medline, LILACS, Scielo and PsycINFO. Studies included were observational, among adults, measuring FS and its association with MP worsening or development, recruiting participants or data from any setting, and providing outcome data for at least one pain outcome measure.

RESULTS: 445 potentially relevant citations was identified, which included 438 unique citations, 419 of which did not meet inclusion criteria. Final search included nine studies. The most frequent pain types reported were low back pain and neck

pain. Descriptions of financial stress varied. Overall, exposure to financial stress was determined according to some difficulty in relation to afford necessities. All studies, except one, found significant associations between some type of MP and FS.

CONCLUSION: This systematic review brought the available data on the relationship between FS and MP. It is possible to state that there is reasonable evidence of FS as a strong predictor for the onset of MP. It is necessary to be aware of this issue when dealing with pain patients during the current humanitarian crisis.

Keywords: Economy, Financial stress, Man-made disasters, Musculoskeletal pain, War

RESUMO

JUSTIFICATIVA E OBJETIVOS: Na história recente, grandes catástrofes são seguidas de crises econômicas, que comumente são acompanhadas por altos níveis de estresse psicológico relacionado a dificuldades financeiras. A relação entre esse estresse financeiro (EF) e a dor musculoesquelética (DME) não está elucidada. O objetivo desta revisão sistemática foi avaliar criticamente as evidências da relação entre tais dificuldades financeiras e a DME.

MÉTODOS: Uma busca abrangente foi realizada nas seguintes bases de dados: Medline, LILACS, SciELO e *PsycINFO*. Os estudos incluídos foram observacionais, entre adultos, aferindo o EF e sua associação com a piora ou desenvolvimento de uma DME, recrutando participantes ou dados de qualquer ambiente, e fornecendo dados de resultado para ao menos uma medida de resultado de dor.

RESULTADOS: Foram identificadas 445 citações potencialmente relevantes, que incluíram 438 citações únicas, 419 das quais não atenderam aos critérios de inclusão. A pesquisa final incluiu 9 estudos. Os tipos de dor mais frequentes relatados foram lombalgia e cervicalgia. Descrições de estresse financeiro variaram. No geral, a exposição ao estresse financeiro foi determinada de acordo com alguma dificuldade em relação às necessidades de pagamento. Todos os estudos, exceto um, encontraram associações significativas entre algum tipo de DME e EF.

CONCLUSÃO: Este estudo trouxe os dados disponíveis sobre a relação entre EF e DME. É possível afirmar que há razoável evidência do EF como um forte preditor para o aparecimento de DME. É preciso estar ciente dessa questão ao lidar com pacientes com dor durante a atual crise humanitária.

Descritores: Desastres provocados pelo homem, Dor musculoesquelética, Economia, Estresse financeiro, Guerra.

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Presented on April 19, 2023.

Accepted for publication on July 17, 2023.

Conflict of interests: none – Sponsoring sources: none.

HIGHLIGHTS

- It appears that, through several different mechanisms, financial crisis impacts the prevalence of musculoskeletal pain, increasing the demand for symptom control.
- Due to the global crisis, some patients may lose their financial ability to access the various treatment modalities. As a result, their symptoms may worsen or become chronic.
- Public health systems must prepare for an increase in demand, due to the inability of many patients with musculoskeletal pain to remain in private care.

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INTRODUCTION

Musculoskeletal pain disorders (MP) represent the second major cause of disability, just following mental health conditions¹. Among a variety of psychological factors², stress disorders are mostly cited as associated with some types of MP³. In recent years, literature has been focusing on specific types of stress and its relationship with MP⁴. Financial stress (FS) represents a type of psychological stress among individuals who fail to gather basic expenses⁵ or have more debts than the ability to pay⁶.

FS can be triggered by a variety of events and can reach large populations if they are a result of a global economic crisis⁷, or they can be geographically more concentrated as in natural disasters⁸. The new COVID-19 outbreak has become the leading global health problem since December 2019. One of the strategies recommended by the World Health Organization (WHO) to control virus spread since the beginning of pandemics is social isolation. This crucial behaviour initiated a global economic crisis⁹.

At the end of February 2022, Russia announced the beginning of a military intervention in Ukraine, with severe economic repercussions, affecting the financial market and producing an increase in the prices of several items, including those of first necessity. Its negative effects cannot yet be precisely determined, and it represents a worldwide emergency in terms social and economic consequences¹⁰.

Comparable to other crisis, higher levels of FS are expected in several communities around the world. Therefore, people may not be able to gather their basic individual needs, which represent a nature of stress that predicts worse health indicators¹¹, including MP. Financial difficulties circumstances are implicated in an increased incidence of low back pain and neck pain, and higher odds of shoulder pain^{8,12,13}. On the other hand, the impact of pain on economics is enormous, with the estimated total cost above 3.0% of GDP, rising above costs of cardiovascular diseases and cancer¹⁴. Thus, in post-pandemic and war times, the economic crisis and the increased prevalence of pain may represent a double route, with not enough knowledge within this area.

The central aim of this systematic review was to summarize the effects of FS exposure on MP outcomes. Since there is no asserted definition to FS, the focus of this research was on feelings of economic hardship, concerns, or fail to cope with financial problems, whether generated by economic crisis, or financial adversities¹⁵.

METHODS

This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement¹⁶. The systematic review protocol was registered at the International Prospective Register of Systematic Reviews (PROSPERO: CRD42020196947). This systematic review followed the recommended steps: 1. elaboration of the guiding question, 2. establishment of inclusion and exclusion

criteria, 3. critical analysis of the included studies, and 4. extraction, synthesis, and presentation of data^{17,18}.

Search strategy

To answer the review question, observational studies investigating the association between the exposure (FS) and outcome (worsening or development of an acute or chronic MP) were retrieved. The research question was: "Is there any effect of financial stress (including financial difficulties, economic hardship, financial problems) on acute or chronic musculoskeletal pain?". A comprehensive search was conducted using the following databases: Medline, (via Pubmed), LILACS (via BVS), Scielo and PsycINFO until April 2022. The review process was carried out by two independent reviewers (MK and MN), whose disagreements were discussed until the consensus on the inclusion of the article to compose the review. Search terms were defined according to the PECO strategy and included, primarily: financial stress, over-indebtedness, and pain, with related terms in all fields. Limits were set to include only quantitative studies of adults written in the English, Portuguese, or Spanish languages, with no publication period limits. Reference lists of retrieved sources were also searched. The search was performed with the following keywords: 'financial stress', 'financial difficulties', 'financial burden', 'financial strain', 'financial hardships', 'economic hardship', 'over-indebtedness', 'financial problems', 'pain' and 'musculoskeletal pain', combined by Boolean operators.

Eligibility criteria

Each study had to meet the following inclusion criteria: 1) included adults (≥ 18 years of age), 2) measured FS and its association with MP worsening or development (regardless of pain duration or pain site), 3) studies recruiting participants or data from any setting; studies providing outcome data for at least one of the following pain outcome measures: pain intensity, pain perception, disability related to pain, and pain severity. Studies were excluded if the exposure was related to low income, or the outcome was not MP (e.g., visceral or cancer pain). Autoimmune and inflammatory diseases like spondyloarthropathies, arthritis or osteoarthritis were also excluded since pain related symptoms are mediated through distinct mechanisms.

Data extraction (selection and coding)

Initially, records was screened based on titles and abstracts against the eligibility criteria by two reviewers (MK and MN). Two independent reviewers (MN and NC) performed data extraction and studies data were typed into an excel template. The data extracted was: authorship; year of publication; country; study design; sample size; sample characteristics (age mean and SD or range); FS assessment; pain outcomes assessments; the magnitude of an association between the exposure (FS) and the outcome (acute or chronic MP), using odds ratios, relative risk, or hazard ratios (HR) and the 95% confidence interval (CI). Covariates included in analysis.

Methodological quality assessment

To assess the quality of the included studies, the Quality Assessment Tool for Observational Cohort and Cross-sectional Studies¹⁹ was used. All review authors assessed the studies individually and subsequently compared their results. Disagreements were debated until unanimity was achieved. Every article received a total score according to the assessment tool (poor, fair or good). Item 1 of the tool assessed research question and aims; items 2 to 5 evaluated sample quality, external validity, and selection bias risk; item 6 and 7 assessed timing of exposure and outcome measurements; item 8 assessed reporting of different levels of exposure; items 9 and 11 assessed definition, validity, reliability, and implementation of exposure and outcome variables; item 10 evaluated repetition of exposure measurements; item 12 considered outcome assessor blinding and measurement bias risk; item 13 evaluated loss to follow up bias risk; and item 14 assessed confounding and internal validity.

Each study was reviewed by two independent investigators, who scored each item yes (Y), no (N), cannot determine (CD) or not applicable (NA). For an objective quality score, total Y scores were added up for each study and recorded as a percentage of maximum possible score for each study. N and CD items were

not considered, and NA items were deducted from the maximum possible score for each study. Study quality was assessed via percentage (>50% good, 30% - 50% fair, <30% poor)¹⁹. Data were taken from nine studies^{16,8,12,20-24} (Table 1).

RESULTS

This research identified 445 potentially relevant citations, which included 438 unique citations, 419 of which did not meet inclusion criteria. Overall, 19 studies that warranted analysis of the full text was identified, 10 of these were excluded from the review. Four studies were excluded because they did not reported how pain was measured and six were excluded because did not measure financial difficulties. This review comprised nine studies (Figure 1).

Main result and study characteristics

The studies evaluated were heterogeneous, but most of them found a positive association between some type of MP and FS. This

Table 1. Studies distribution according to author, design, measurements, and pain-related outcomes.

Authors, Countries	Design / Sample(n)	Study population	FS	Pain	FS assessment	Pain assessment	Pain Outcomes
Jradi, Alanazi and Mohammad ²⁰ Saudi Arabia	Cross-sectional (410)	Gender: M (n=43); F (n=367) Age: 20 - 30 yr (n=173) 31- 40 yr (n=163) >40 yr (n=74) 79.5% of the participants stated that they had low-back pain (LBP). 31.9% had been diagnosed by a health-care professional.	Financial problems	LBP	Multiple domains questionnaire	Multiple domains questionnaire	Financial problems were associated with LBP in univariate analysis (OR = 2.08; 95%CI: 1.26-3.38). while factors that remained significantly associated with LBP in the final multivariate analyses were frequent lifting (OR = 2.04; 95%CI:1.09-3.81), work-related stress (OR = 4.22; 95%CI: 2.34-7.48), and lack of job satisfaction (OR = 1.87; 95%CI: 1.24-3.58).
Jay et al. ²¹ UK	Prospective cohort (2378)	Gender: M (n=1238); F (n=1140). Pain at age 68: CWP (n=164 women); (n= 89 men); CRP (n= 400 women; n= 327 men)	Experience of financial hardship	Chronic widespread (CWP) and regional pain (CRP)	Self-reported of financial hardship	Self-reported frequency of pain	Results from multinomial logistic regression models described that the accumulation of financial hardship across adulthood was associated with an increased risk of CWP (hardship at one point reported vs no hardship RRR 1.93 [95% CI: 1.11 to 3.35]; hardship at both points RRR 3.90 [95% CI: 1.20 to 12.64]).
Hagiwara et al. ²² Japan	Cross-sectional (1809)	Gender: M (n= 825); F (n= 984); Age: <65 yr old (n=824) or ≥ 65 yr old (n=824). Shoulder pain (2 yr after Earthquake) was categorized as Absence (n=1635) and Presence (n=174).	Economic hardship	Shoulder pain	Self-reported economic hardship	Self-reported shoulder pain	There were significant differences in the risk of having shoulder pain in those with economic hardship of "hard" (OR= 1.71; 95% CI:1.08-2.7) and "very hard" (OR= 2.51, 95% CI: 1.47- 4.29).

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Tabela 1. Distribuição dos estudos de acordo com autor, projeto, medidas e resultados relacionados à dor – continuação

Authors, Countries	Design / Sample(n)	Study population	FS	Pain	FS assessment	Pain assessment	Pain Outcomes
Sekiguchi, et al. ¹² Japan	Cohort (1.359)	Gender: M (n=650); F (n=709). The mean age: 63.7 yr (SD: 16.3). Participants with new-onset of neck pain (n=175)	Financial difficulty self-perception	Neck pain	Self-reported household economic condition	Self-reported new-onset of neck pain	A significantly higher rate of new-onset neck pain was observed in participants who considered their subjective economic hardship to be “hard” (OR= 2.10, 95% CI: 1.34-3.30) or “very hard” (OR= 3.26, 95% CI: 1.83-5.46; p<0.001) compared with those who considered their hardship to be “normal.”
Yabe et al. ⁸ Japan	Longitudinal panel study (1292)	Gender: M (n=584); F (n=708) Age: <65 yr old (n=627); ≥ 65 yr old (n=665). Low back pain at 3 years after the earthquake: Absence (n=1094). Presence (n=198)	Subjective economic hardship	LBP	Self-reported household current economic situation	Self-reported LBP	There was significant association between new onset of low back pain and “Very hard” (OR=3.19, 95% CI: 1.84-5.53) in subjective economic hardship.
Hagiwara et al. ¹³ Japan	Cross-sectional (986)	Gender: M (n= 431); F (n=555). Age: >65 yr (n= 456) <65 yr (n=530). Low back pain: Absence to Absence (n=653); Presence to Presence (n=117); Presence to Absence (n= 112); and Absence to Presence (n=104).	Decrease in income	LBP	Self-reported decreased income	Self-reported non-quantified LBP	There was significant difference between low back pain and “decrease in income” (OR= 1.93, 95% CI: 1.23-3.03). In the subgroup analyses, there was significant difference between low back pain and “decrease in income” for under 65 years old (OR= 1.84, 95% CI: 1.03-3.29)
Generaal et al. ²³ Netherlands	Retrospective cohort	2039 subjects 18-65 yr Gender: F 62.6% free of chronic MP; follow-up assessments 2 years, 4 years and 6 years later	Serious financial problems	Chronic multisite MP	List of Threatening Events Questionnaire	Chronic Pain Grade	Nearly each life event showed a positive association with chronic pain onset, which were significant for financial problems (5.8%; HR (95% CI) 1.54(1.05 to 2.25); p=0.03), independently of biological stress systems function, sociodemographics, lifestyle, chronic diseases, depression, and anxiety.
Rios et al. ²⁴ USA	Prospective cross-sectional (249)	Gender: F (n=249) Age: 37 - 72 yr (M=57.3; SD=8.4) Pain: Osteoarthritis (N=105), fibromyalgia (N=46) or both (N=99).	Ability to afford basic needs	MP pain intensity	Economic hardship scale	Numeric rating scale	The interaction between daily financial worry and economic hardship on pain was significant even after controlling for the influence of level 2 control variables (economic hardship, age, neuroticism, diagnostic group, and working status) ($\beta = .47$, SE .23, p .04).
Ochsmann et al. ⁶ Germany	Cross-sectional (949)	Gender: M (n=446); F (n=499) Age: 18-79 yr. 80.8% actual back pain A representative sample of the German general population (n = 8318) was used as non-indebted reference group.	Over-indebtedness	L B P	Counselling agencies questions on over-indebtedness	Self-reported low back pain	Being over indebted was identified as an independent effect modifier and was associated with higher odds of suffering from low back pain (aOR:10.92, 95% CI: 8.96 - 13.46).

aOR = adjusted odds ratios; CI = confidence intervals; MP = musculoskeletal pain FS = financial stress; DEGS1 = Germany (2008–2011); OID-survey = Germany (2017); F = female, M = male; LBP = low back pain.

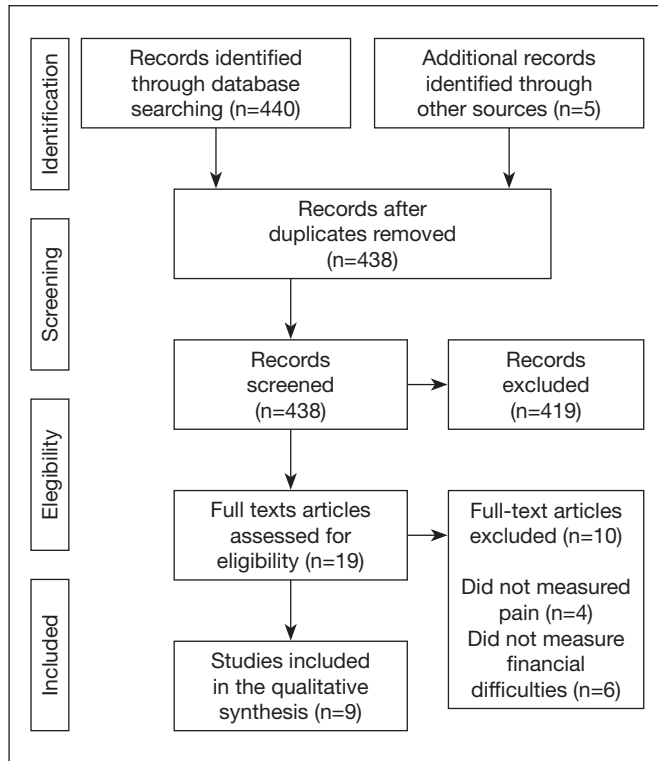


Figure 1. Flowchart of studies selection according to PRISMA.

is consistent across countries, populations, and study design but variable in magnitude. Only one study did not find an association when adjusting for variables associated with work-related stress²⁰. The odds ratios disregarding the types of pain, ranged from OR 1.71 (95% CI 1.05–2.25)¹³ to 10.92 (95% CI 8.96 – 13.46)⁶. One longitudinal prospective study reported RRR 3.90 (95% CI 1.20 to 12.64) for both study points for chronic widespread pain²¹. A hazard ratio of 1.54 (95% CI 1.05 – 2.25) for chronic multi-site pain was reported in a longitudinal retrospective study. Five studies were of cross-sectional design^{6,13,20,22,24}. Four studies were longitudinal^{8,12,21,23} (Table 1). Studies came from: Japan (4 studies)^{8,12,13,22}, USA (1 study)²⁴, one from Germany⁶, Saudi Arabia²⁰, and Netherlands²³. Study size ranged from 249 participants²⁴ to a large prospective cohort with 2,378 participants²¹ (Table 2).

Financial stress exposure

Descriptions of FS varied between studies. Overall, exposure to FS was determined according to some difficulty in relation to afford necessities. Studies investigated issues concerning ability to afford basic needs, over-indebtedness, financial problems, and self-perceived economic hardship (Table 2). One study investigated participants who searched for financial counselling in advisory agencies⁶.

In relation to the tools used to assess FS a high heterogeneity was found. Most studies utilized questions assessing self-reported

Table 2. Quality assessment tool for observational cohort and cross-sectional studies

Criteria	Jradi et al. ²⁰	Jay et al. ²¹	Hagiwara et al. ²²	Sekiguchi et al. ¹²	Yabe et al. ⁸	Hagiwara et al. ¹³	Generaal et al. ²³	Rios et al. ²⁴	Ochsmann et al. ⁶
1. Was the research question or objective in this paper clearly stated?	Y	Y	Y	Y	Y	Y	Y	Y	Y
2. Was the study population clearly specified and defined?	Y	Y	Y	Y	Y	N	Y	Y	Y
3. Was the participation rate of eligible persons at least 50%?	Y	N	N	N	N	N	Y	Y	N
4. Were all the subjects selected or recruited from the same or similar populations (including the same period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?	N	Y	Y	Y	Y	Y	Y	NA	N
5. Was a sample size justification, power description, or variance and effect estimates provided?	N	Y	NR	NR	NR	NR	Y	Y	Y
6. For the analyses in this paper, were the exposure(s) of interest measured prior to the outcome(s) being measured?	N	Y	N	Y	Y	N	Y	NR	N
7. Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed?	N	Y	N	Y	Y	N	Y	Y	NA
8. For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g., categories of exposure, or exposure measured as continuous variable)?	Y	Y	Y	Y	Y	Y	Y	Y	Y

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Table 2. Quality assessment tool for observational cohort and cross-sectional studies – continuation

Criteria	Jradi et al. ²⁰	Jay et al. ²¹	Hagiwara et al. ²²	Sekiguchi et al. ¹²	Yabe et al. ⁸	Hagiwara et al. ¹³	Generaal et al. ²³	Rios et al. ²⁴	Ochsmann et al. ⁶
9. Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?	Y	Y	NR	Y	Y	Y	Y	Y	NR
10. Was the exposure(s) assessed more than once over time?	NR	Y	N	Y	Y	N	Y	Y	N
11. Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?	Y	Y	NR	Y	Y	CD	Y	Y	NR
12. Were the outcome assessors blinded to the exposure status of participants?	NR	NR	NR	NR	NR	NR	NR	NR	N
13. Was loss to follow-up after baseline 20% or less?	Y	N	N	N	N	N	Y	Y	N
14. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?	CD	Y	Y	Y	NR	Y	Y	NR	Y
Quality rating*	Good	Good	Fair	Good	Good	Fair	Good	Good	Fair

CD = cannot determine; NA = Not applicable; NR = Not reported. *Quality Rating: Poor ≤ 30%; Fair 30% - 50%; Good ≥ 50%.

FS. A study²³ applied the List of Threatening Events Questionnaire, which covered different types of adverse events, including serious financial problems. Two studies investigated self-reported household economic condition^{8,12}. Economic hardship was evaluated in one study through the economic hardship scale²⁴ and self-reported financial difficulties¹³.

Types of MP

Included studies examined diverse MP conditions. Most of studies assessed low back pain^{6,8,20,22}. Other types of MP were of neck pain¹², shoulder pain¹³, one study evaluated chronic multisite MP²³, and one study did not specify the pain site, instead investigated pain intensity²⁴. To assess pain related variables, for example intensity, severity, and new onset of pain, most studies assessed self-reported pain^{6,8,12,13,22}. One study utilized the Chronic Graded Pain questionnaire²³ and one applied the numeric rating scale²⁴.

Association between musculoskeletal pain and financial stress

Owing to the high heterogeneity of outcomes and exposure measures between studies, it was not possible to perform a quantitative synthesis. Table 2 summarises the results of the included studies. The longitudinal studies included shown that very hard subjective economic hardship increased the odds of having neck pain (OR=3.26)¹² and low back pain (OR=3.19)⁸. A study²¹ found that financial hardship across adulthood was associated with increased risk of chronic widespread pain (hardship at one point reported vs no hardship RRR 1.93 [95% CI: 1.11 to 3.35]; hardship at both points RRR 3.90 [95% CI: 1.20 to 12.64]). Authors²³ in a retrospective cohort

found significant association for financial problems (5.8%; HR (95% CI) 1.54 (1.05 to 2.25); p=0.03), independently of biological stress systems function, sociodemographics, lifestyle, chronic diseases, depression, and anxiety. However, a study²⁰, after an adjusted multivariate logistic regression, found that low back pain did not remain significantly associated to financial problems. Instead, factors related to job satisfaction, work-related stress and frequent lifting remained associated in the final model.

Quality assessment

The results of the quality assessment are presented in table 2. Six studies rated 'good' quality^{8,12,20,21,23,24}. The remained studies were of "fair" quality^{6,13,22}.

DISCUSSION

This review indicates that financial hardship was associated with higher odds of MP onset. The longitudinal studies included shown that very hard subjective economic hardship increased the odds of having neck pain¹² and low back pain⁸. Financial hardship across adulthood was associated with increased risk of chronic widespread pain²¹.

Apart from one study, the other studies found that FS increased the risk of painful symptoms, as well as preceded the onset of MP conditions. Besides its contribution to increased psychological stress, FS seems to worsen other health indicators, such as increased smoking, alcohol consumption and body mass. Unlike emotional stress, its action seems to be more direct²⁵. In families, FS causes more marital conflicts, the effects of which may remain as a negative experience for generations.

As far as is known, this is the first summary of evidence that shows the role of FS on MP. An association between several types of MP, such as low back pain^{6,8,20,22} shoulder pain¹³, neck pain¹², MP intensity²⁴ and chronic multisite MP²³ was found. The results of this research also suggest that higher levels of FS could be a significant predictor for pain onset, indicating a possible causal association. In one cohort, participants were followed from childhood to the sixth decade of life, and moderate to high levels of FS preceded the onset of chronic widespread and regional pain symptoms, observed when these individuals reached older ages²¹.

A research²³ analysed longitudinal data from an ongoing cohort study conducted among 2981 adults to verify whether function of biological stress systems, adverse life events, and their combination predicted the onset of chronic multisite MP. The authors considered chronic multisite MP as pain in the extremities, the back, and the neck in the prior 6 months. The participants were free of the outcome at baseline, and they were followed up for the onset of pain over 6 years. Adverse life events did predict onset of chronic multisite MP, suggesting that psychosocial factors play a role in triggering the development of this condition. Among a diverse number of life events, serious financial problems showed a higher positive association with chronic pain onset, even higher than separation from partner and being seriously ill. These findings reinforce the biopsychosocial model of pain, which is mediated by a complex interaction of biological, psychological, social, and economic factors²⁶.

There is an extensive literature in which the relationships between socioeconomic conditions and MP are discussed. However, most of these studies were based on ecological measures centered on attributes such as living conditions, or family income. These indicators may not reliably reflect individual experiences of stress arising from more immediate economic circumstances, such as monthly expenses and debts. Hence, FS has been researched more frequently since the economic crisis of 2008, when individuals and families suffered a great impact²⁷.

FS is a subjective assessment that reflects self-perceived economic condition at some point in time. Even though belonging to lower income social stratum, some individuals may not present increased levels of pain due to FS. The higher prevalence of MP in this population may be due to difficult approach to treatment, or to a multidisciplinary team, costs of medications or support networks²⁸. On the other hand, individuals with a better social stratum and higher family income may exhibit a high level of FS, especially when they are over-indebted⁶.

In addition, it is necessary to consider that different individuals, with the same level of economic difficulty, may not present similar scores of FS²⁸. It may be more accurate to assess self-perceived financial condition instead of family income²⁹, particularly in times of crisis. A study found that the higher the daily FS, the greater the pain perception thereafter²⁴.

Different assessments related to economic conditions such as family income or financial difficulties may influence differently in the onset, modulation, and chronicity aspects of MP.

Economic crisis increases the individuals' chances of being unable to pay their costs, consequently predisposes to several negative health outcomes³⁰. The results of this study pointed out that pain experience is more frequent among over-indebtedness people³¹. In turn, over-indebtedness was an independent predictor for low back pain⁶ and crisis income reduction was associated with low back pain²².

Another effect of these crisis is the rise in the unemployment rate, which can remain for long periods. During the financial crisis of 2008-2009, in the age group most affected by unemployment, there was a significant increase in hospital admissions with headache as the main complaint³². Otherwise, a study¹², after the tsunami in Japan, found that neck pain was a more prevalent finding in employed individuals when compared to the unemployed. The authors pointed out that this fact could be linked to the fear of having their jobs also destroyed by the financial crisis after the disaster.

In this same study, the authors also found a significantly higher rates of new-onset neck pain in participants who considered their subjective economic hardship to be "hard" or "very hard", compared with those who considered their hardship to be "normal". This finding was reported in other series of studies after the earthquake in Japan, but applied for other types of pain, low back pain⁸ and shoulder pain¹³. Nevertheless, this relationship might be a result of an outgrowth of adverse situations, including destruction of homes, dislocation of populations, human deaths, and reduction of public services inside the community.

This study has some strengths, which include the use of a pre-specified protocol registered on PROSPERO, the PRISMA guidelines and the moderate to high quality of studies included. Procedures used for conducting this review were in accordance with current guidelines. Regarding the limitations of this review, several ways of measuring FS were found, which may be an important methodological problem. A publication bias due to language restriction must also be assumed. Another limitation is that longitudinal associations were found only in two studies, so conclusions on FS as the main predictor of pain onset could not be firmly drawn. Finally, mediation analysis should be largely carried out to identify causal mechanisms, to avoid possible inflation of these results. The individual pain severity perception is modulated, among other factors, by coping strategies (6). A path for future research should include four aspects: 1) quantitative and reproducible methods must be developed to identify events that generate FS; 2) quantify how stressful these events are for everyone; 3) develop supportive interventions to improve management of financial situation and, finally, 4) assess which of these interventions are most effective for painful symptoms control and suffering alleviation.

CONCLUSION

This study brought the available evidence on the relationship between FS and MP. It is possible to state that is fair evidence on FS as a strong predictor for the onset of MP. The findings suggest

that a broader diagnostic assessment should be accomplished to identify whether patients are unable to afford basic needs or are dealing with financial difficulties, especially when managing patients in pain during the current pandemic crisis. This may lead to a more effective treatment approach for controlling MP symptoms.

AUTHORS' CONTRIBUTIONS

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Data Collection, Research, Methodology, Writing - Preparation of the Original, Writing - Review and Editing, Supervision

Nataly Pereira Costa

Data Collection, Methodology, Visualization

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