

# Do financial difficulties make it harder to deal with pain and loneliness?

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## Abstract

The present study examined the association between social and emotional factors and the perception of pain severity among chronic pain patients. Specifically, a large sample (N = 308) of patients recruited in two major pain clinics in Israel, completed a set of questionnaires including: the loneliness questionnaire, the West Haven-Yale Multidimensional Pain Inventory (WHYMPI), and the State-Trait Anxiety Inventory (STAI). We examined two possible models for the associations between these variables. In the first model, factors of loneliness were hypothesised to be associated with perceived pain severity through anxiety. In the second model, financial status was hypothesised to be associated with pain severity through the factors of loneliness and anxiety. Structural Equation Modeling revealed that both models showed good fit of the data. Based on these analyses a third, combined, model was conceived. That model showed that perceived financial status was associated with anxiety both directly and through two factors of loneliness Emotional distress and Growth and discovery. In addition, the Social inadequacy and alienation factor of loneliness was associated with anxiety directly. Finally, anxiety was directly associated with pain severity. These findings are discussed in the context of financial effects on cognition and wellbeing.

The present article examines the association between financial difficulties and loneliness. Studies have pointed out to the link between poverty, or low Socioeconomic status [SES] and maladaptive behavior, such as failing to adhere to drug regimens, tardiness and decreased chances that appointments that were set will be kept [1]. Mani *et al.* [1] further suggest that poverty captures attention, triggers intrusive thoughts, and reduces cognitive resources and could be adding to stress that the individual may already feel. Mani *et al.* [1] indicated that budgetary preoccupations can in real time impede cognitive function. Consequently, it is suggested that, those in the low SES level are not as involved in personal reflections and attending to their feelings, since bringing “home the bacon” may be the most pressing issue for them. Shah *et al.* [2] maintained that when money is scarce, it is naturally difficult to meet expenses which then seem urgent and pressing. As a result, those with scarce resources tend to see the world not as a hospitable place, many times feeling that ‘no one cares about them, their responsibilities, and their needs’, thus reporting greater loneliness than those who are in better positions financially [3].

It has been reported that 70-85% of people, at least in North America, suffer from back pain *at some point* in their lives, and additionally there is a similar percentage who suffer from pain caused by arthritis, cancer, and related illnesses; pain that is chronic. The worldwide pain management prescription drug market totalled approximately \$29 billion in 2007 [4] and certainly even more than that at present. Patients suffering chronic pain are those who endure pain which is continuous and strong enough to interfere with life activities and can significantly affect their interpersonal, and particularly marital and sexual relationships, which almost always deteriorate as a result of pain. D’Ardenne [5] observed that chronic illnesses have either a

predictable or unpredictable trajectory. They may result in physical and psychological changes, and also to occupational and social roles in work, family life, and leisure activities [5]. The reduction in social contact may contribute to their isolation and loneliness [4]. Pain that persists for months and years observed Turk [6] may impact on many aspects of a person’s functioning such as emotional, interpersonal, social and physical wellbeing.

## Loneliness

Theeke [7] noted that the physical correlates of loneliness include poor perceived health, physical symptomatology, hypertension, sleep disturbance, and in older people-dementia. The negative psychological correlates include depression, negative self-assessment, diminished intimacy in marriage, general psychological distress, and psychological distress socially [8]. When lonely we may suffer lower economic status, low number of friends, lack of religious affiliation, and even domestic violence [9].

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Loneliness is a universal experience especially in the beginning of the 21st century [10,11]. As Pappano [12] so clearly observed that we are losing touch, and we are oblivious to it. Stivers [13] suggested that a clear indication that the fear of being alone, is people's desire to talk to people that they hardly know, baring all on TV shows, and seeking crowds in shopping malls just so they are not alone [9,10].

Loneliness is such a painful and profound experience that it would be unimaginable to think that it does not affect all facets of our lives. Research indicates that it affects us psychologically, emotionally, health wise, our relationships in general and intimate ones in particular as well. Since social connectedness is so central to our survival, we may expect to find that loneliness may have adverse physical, emotional, and spiritual effects on us [9].

### Socioeconomic level, pain, and loneliness

Research indicates, suggested Gallo and Matthews [14], that negative emotions and attitudes predict health outcomes. The evidence, they added, is most compelling for the effects of depression, hopelessness, and hostility on cardiovascular related death, while mortality was observed to be related to anxiety in sudden cardiac death. Stephens *et al.* [15] suggested that connecting to and relying on others in times of need can only be done if one's sociocultural and socioeconomic contexts affords opportunities for reliable social connections and if others are perceived as supportive and trustworthy.

In this study we looked at the perception of pain severity endorsed by chronic pain patients. We examined the extent to which its severity is determined by loneliness and SES related anxiety. Specifically, we hypothesized that anxiety will mediate the connection between loneliness and perceived pain severity. To this end, anxiety was assessed using the State-Trait Anxiety Inventory (STAI) [16], Loneliness was assessed by employing Rokach's Loneliness Experience and Coping With Loneliness scale [17,18], and pain severity was assessed by the West Haven-Yale Multidimensional Pain Inventory (WHYMPI) [19]. We examined this hypothesis using two models. In the first (Model L), the above described mediation model was assessed with SES and sex held as covariates. In the second model (Model S), SES was considered as being directly connected with loneliness and anxiety. Here, sex was treated as covariate as well. Thus, the two models differed in whether SES was treated as a predictor (Model S) or not (Model L).

## Method

### Participants

Five hundred and twenty seven patients who attended the Pain Clinics in two major hospitals in Israel have volunteered to anonymously answer the questionnaires while waiting to be seen by the clinic's physician or nurse. Only chronic pain patients who had been struggling with pain for a period of at least three months with no relief from regular attempts to help them [medication, physiotherapy, or injections attended those clinics]. It took approximately 20 minutes to fill out the questionnaires. Participants were those who could read and write Hebrew. Those that did not, were not invited to partake in the study. Those who were interested to receive the analyzed results were invited to provide their names and e-mail addresses.

### Procedure

After receiving clearance from the hospitals' and from the university Institutional Review Boards, research assistants approached patients suffering from chronic pain and caregivers who accompanied

them to the doctors' appointment, read to them the informed consent, and asked for their cooperation in responding to the questionnaires, anonymously. Each set of questionnaires took about 30 minutes to complete. Participants were made aware that they could provide their names and e-mail addresses and receive the results when those will be available. No one requested it.

### Measures

Three self-report instruments were employed to assess the loneliness, and the reaction and burden of caregivers.

1) **The loneliness questionnaire** [17,18] is a well-established measure used to assess the qualitative aspects of loneliness, and how participants cope with its pain. All items for the questionnaire were written by the senior author and based on Rokach's previous research on loneliness [17,20], and was utilized in numerous studies since then.

Five factors comprise the loneliness experience and each is a subscale in the loneliness questionnaire. Emotional distress was the most salient factor to emerge. It accounted for 19% of the variance. This included items that captured the intense pain, inner turmoil, hopelessness, and feelings of emptiness associated with loneliness [e.g. "I experienced feelings of intense hurt" and "I experienced being overwhelmed with feelings of dread"]. The second factor, Social inadequacy and alienation (7% of the variance), addressed the perception and self-generated social detachment which were reported as part of the loneliness experience [e.g. "I felt I was boring and uninteresting" and "I felt inadequate when interacting with others"]. Growth and discovery was the third factor and accounted for 4% of the variance. It highlighted the positive and growth-enhancing aspects of loneliness [e.g. "I discovered a personal strength I was previously unaware of" and "Life seems richer and more interesting than it was previously"]. Interpersonal isolation (3% of the variance) the fourth factor, depicted feelings of alienation, abandonment, and rejection, as related to a general lack of close relationships and/or absence of a primary romantic relationship [e.g. "I felt I had no one to love or be loved by" and "I felt deserted by those closest to me"]. Self-alienation, the fifth factor (3% of the variance), described a detachment from one's self that is characterized by numbness, immobilization, and denial [e.g. "I felt as if my mind and body were in different places" and "I felt that I was observing myself as if I was another person"]. In all, these factors accounted for 36% of the variance. Each factor was a subscale in the questionnaire and participants' scores are the sum of items they endorsed in each subscale. The questionnaire had 30 items which describe the experience of loneliness [17]. Participants were assured of anonymity and were not asked to identify themselves. Kuder-Richardson internal consistency reliabilities were calculated and yielded the following alpha values: Emotional distress = 0.76; Social inadequacy and alienation = 0.70; Growth and discovery = 0.81; Interpersonal isolation = 0.72; Self-alienation = 0.72. K-R alpha for the 30 items questionnaire was 0.76.

2) **The West Haven-Yale Multidimensional Pain Inventory (WHYMPI)** [19]- The scale developers described it as a "52-item, 12-scale inventory that is divided into three parts. Part I includes five scales designed to measure important dimensions of the chronic pain experience including 1) perceived interference of pain in vocational, social/recreational, and family/marital functioning, 2) support or concern from spouse or significant other, 3) pain severity, 4) perceived life control, and 5) affective distress. Part II assesses patients' perceptions of the degree to which spouses or significant others display Solicitous, Distracting or Negative responses to their pain behaviors and complaints. Part III assesses patients' report of the frequency with

which they engage in four categories of common everyday activities; Household Chores, Outdoor Work, Activities Away from Home, and Social Activities. Patient's responses to WHYMPI items are made on a 7-point scale<sup>4</sup>. The present study focused on the severity of reported pain, and not on its socioemotional effects, as the pain was the main, if not the only reason, that patients showed up in pain clinics seeking relief.

In the present research, since the number of questionnaires given to patients in pain, who were waiting to see the physician was large, we shortened the present questionnaire to 20 items, while still maintaining the three parts that were present in the original questionnaire. Kuder-Richardson reliability coefficient in the present study was 0.84.

3) **The State-Trait Anxiety Inventory [STAI]** [16]- A well-known and utilized scale to measure situational anxiety [21]. The questionnaire includes 20 items that include emotional experiences such as stress, tension, lack of security, etc. basically including the "State" part of the STAI. The respondent describes his/her feelings at the time of answering the questionnaire. Sample items include "I feel satisfied with myself", "I feel rested" and "I have disturbing thoughts". Kuder-Richardson reliability coefficient in the present study 0.93.

## Results

### Data preparation and preliminary analysis

Mean total scores were calculated for the five constructs of loneliness experience (emotional distress, social inadequacy and alienation, growth and discovery, interpersonal isolation, and self-alienation), for anxiety scale, and for pain severity. Low mean score represented low level in the variable; for example, low mean score in the pain scale represented low severity of chronic pain. Next, participants with missing mean scores were excluded from further analyses. Specifically, participants were excluded if they were missing mean scores in the anxiety scale ( $n = 199$ ), pain severity scale ( $n = 8$ ), financial status ( $n = 6$ ), or sex ( $n = 3$ ). Thus, of the 527 pain patients who completed the loneliness questionnaire, 308 were included in the analyses. This approach was adopted in order to maximize model validity. Table 1 presents correlations between these measures and their descriptive statistics.

Table 1 reveals that perceived financial status (below average, average, above average) was negatively correlated with most measures of loneliness, as well as with anxiety ( $r = -.229, p < .01$ ) and pain severity ( $r = -.169, p < .01$ ). These correlations indicate that participants who perceived their financial status as below average were more likely to report on emotional distress, social inadequacy and alienation, interpersonal isolation, anxiety, and high pain severity. Exceptional are growth and discovery and self-alienation, which were not associated with financial status. In addition, most measures of loneliness were positively correlated with anxiety and pain severity, indicating that high rates of loneliness were associated more anxiety and pain. Exceptional is growth and discovery which was negatively correlated with anxiety and not correlated with pain severity. Finally, anxiety was positively correlated with pain severity ( $r = .459, p < .01$ ), indicating that high anxiety levels were associated with more severe pain.

### Testing the structural models

The structural models consisted of eight observed variables: emotional distress, social inadequacy and alienation, growth and discovery, interpersonal isolation, self-alienation, anxiety, pain severity, perceived financial status, and sex. In both models, anxiety

**Table 1.** Correlations and descriptive statistics between experience factors of loneliness, financial status, anxiety, and pain severity ( $N = 308$ ).

		Financial status <sup>a</sup>	Anxiety	Pain Severity
	Mean (SD)	2.1 (0.59)	2.48 (0.67)	4.41 (1.18)
Emotional distress	0.31 (0.32)	-.185**	.445**	.278**
Social inadequacy & alienation	0.22 (0.27)	-.162**	.380**	.257**
Growth & Discovery	0.16 (0.25)	0.067	-.148**	-0.031
Interpersonal isolation	0.21 (0.28)	-.148**	.325**	.158**
Self alienation	0.19 (0.26)	-0.032	.302**	.196**

Note. \*  $p < .05$ ; \*\*  $p < .01$ ; <sup>a</sup> Tau-b coefficients were calculated for the correlations with financial status.

mediated the connection between constructs of loneliness and pain severity, and sex was treated as covariate. The models differed in the role of financial status: in the first model financial status was treated as covariate, whereas in the second model it was considered as predictor of loneliness and anxiety. In both models, the five factors of loneliness experience were assumed to covariate each other and were thus treated as such. Figure 1 present the two models.

Structural equation modeling (SEM) revealed good fit indices for both models. Specifically, Model 1, in which financial status was treated as a covariate, was found to fit the data:  $\chi^2 (11, N = 308) = 18.48, p = .071$ ; CFI = .989; NFI = .974; GFI = .987; RMR = .007; RMSEA = .047 C.I. [.000,.083]. Model 2, in which financial status was treated as a predictor, was also found to fit the data:  $\chi^2 (12, N = 308) = 21.00, p = .050$ ; CFI = .987; NFI = .970; GFI = .985; RMR = .011; RMSEA = .049 C.I. [.000,.084]. Comparing the models' Akaike Information Criteria (AICs) revealed that both AICs were fairly identical (86.48 for Model 1 and 87 for Model 2), thus supporting the notion that both models equally fitted the data.

Next, direct and indirect pathways were examined in order to assess the significance of each path. To this end, bootstrapping estimation was conducted for each mediation segment in each of the models. Table 2 presents the pathways and their inferential statistics.

Table 2 reveals that neither the constructs of loneliness nor perceived financial status were directly associated with pain severity. Rather, they were indirectly associated with pain severity through anxiety. Two exceptional variables were social inclusion and self-alienation, which were not associated with pain directly or indirectly. Furthermore, perceived financial status was found to be associated with pain severity through the mediation of emotional distress and growth and discovery.

Driven by the notion that both models equally explained the data, and based on the significant pathways presented in Table 2, we constructed a third, final, model to explain the association between perceived financial status, loneliness, anxiety, and pain severity. The final model is presented in Figure 2.

According to the final model, perceived financial status is associated with pain severity through anxiety, such that negatively perceived financial status is associated with high levels of anxiety, which in turn are associated with more severe pain. Nevertheless, financial status is also associated with pain severity through emotional distress and growth and discovery. In particular, negatively perceived financial status is associated with more emotional distress and less growth, which lead to more anxiety and then to more severe pain. Furthermore, social inadequacy and alienation appears not to mediate the finance

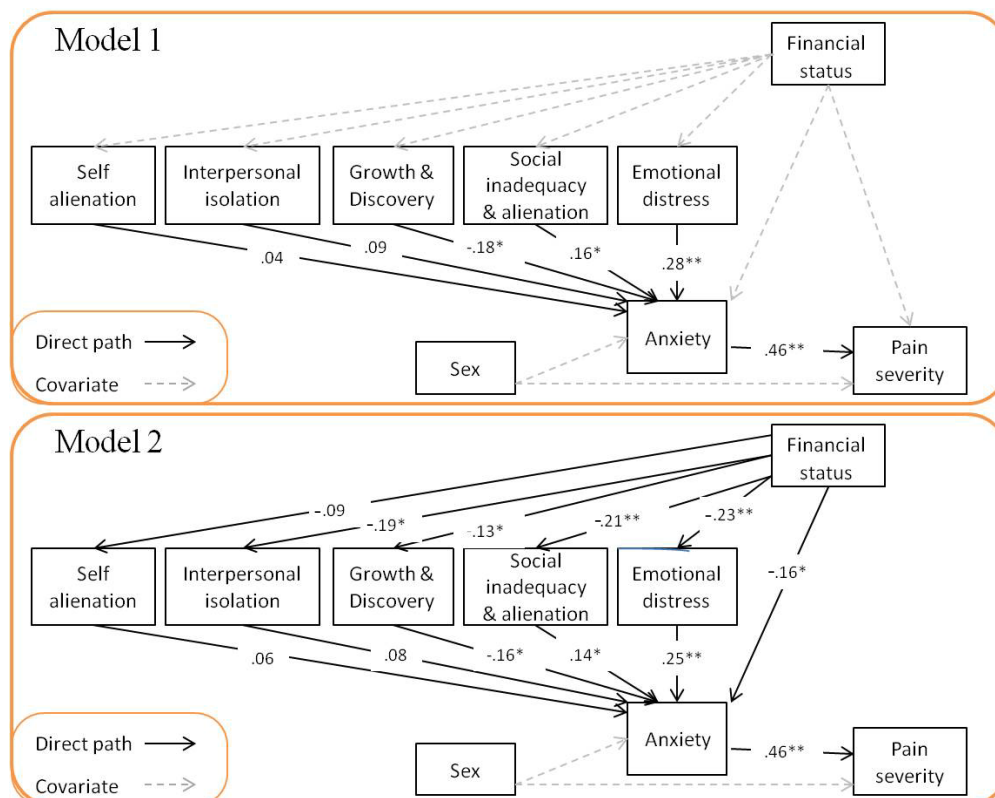
**Table 2.** Effect estimations, SEs, and confidence intervals of direct and indirect pathways in Models 1 and 2.

Model pathway	Effect	SE	95% CI	
			Low	High
<b>Model 1</b>				
Emot. → Pain	.193	.292	-.382	.767
Emot. → Anx. → Pain	.356	.109	.157	.582
Soc. → Pain	.485	.310	-.126	1.960
Soc. → Anx. → Pain	.239	.131	.009	.538
Growth → Pain	.214	.248	-.274	.701
Growth → Anx. → Pain	-.290	.103	-.516	-.114
Inter. → Pain	-.356	.281	-.909	.197
Inter. → Anx. → Pain	.125	.105	-.086	.332
Self. → Pain	.048	.304	-.550	.645
Self. → Anx. → Pain	.098	.109	-.118	.315
<b>Model 2</b>				
Fin. → Pain	-.174	.108	.039	-.387
Fin. → Anx. → Pain	-.124	.045	-.047	-.225
Fin. → Emot. → Pain	-.010	.016	.016	-.051
Fin. → Emot. → Anx. → Pain	-.018	.009	-.005	-.041
Fin. → Soc. → Pain	-.013	.014	.003	-.055
Fin. → Soc. → Anx. → Pain	-.006	.006	.001	-.026
Fin. → Growth → Pain	.013	.020	.065	-.017
Fin. → Growth → Anx. → Pain	-.018	.010	-.005	-.045
Fin. → Inter. → Pain	.007	.011	.046	-.005
Fin. → Inter. → Anx. → Pain	-.002	.004	.002	-.019
Fin. → Self. → Pain	.001	.010	.030	-.015
Fin. → Self. → Anx. → Pain	.003	.004	.018	-.002

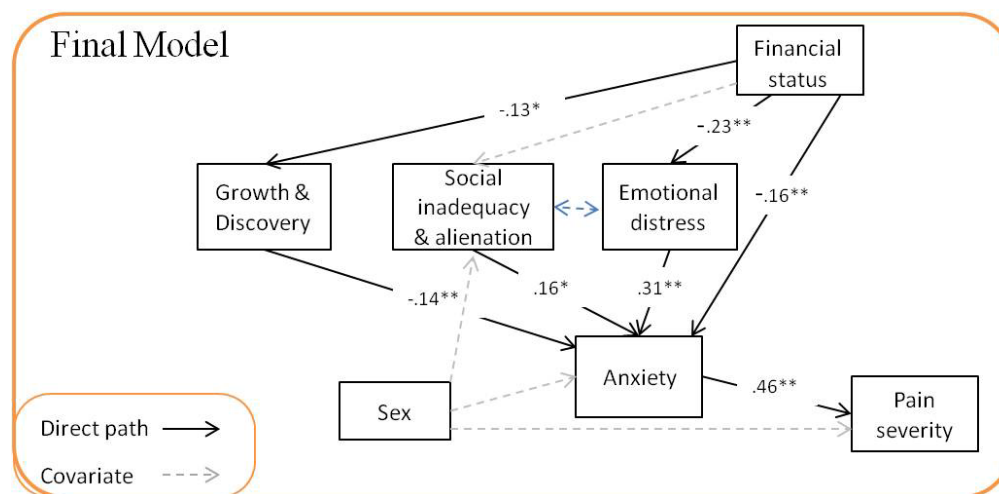
– pain association. Rather, this variable is positively associated with pain through anxiety, such that high levels of social inadequacy and alienation lead to more anxiety, which in turn lead to higher pain severity. Model fit indices suggested a very good fit:  $\chi^2(9, N = 308) = 9.82, p = .365$ ; CFI = .998; NFI = .973; GFI = .991; RMR = .014; RMSEA = .017 C.I. [.000,.068]. Its AIC was 47.82, indicating this model to better fit the data as compared to Models 1 and 2.

### Discussion

In this study we examined the effects that financial status, as reported by participants, on the loneliness and pain experience of chronic pain patients. In general it was found that perceived financial status (below average, average, above average) was negatively correlated with most measures of loneliness, as well as with anxiety and pain severity. These correlations indicate that participants who perceived their financial status as below average were more likely to score lower on Emotional distress, Social inadequacy and alienation, Interpersonal isolation, anxiety, and pain severity. We examined two possible models for the associations between these variables. In the first model, factors of loneliness were hypothesised to be associated with perceived pain severity through anxiety. In the second model, financial status was hypothesised to be associated pain severity through the factors of loneliness and anxiety. Structural Equation Modeling revealed that both models showed good fit to the data. Based on these analyses a third, combined, model was conceived, according to which perceived financial status was associated with anxiety both directly and through two factors of loneliness Emotional distress and Growth and discovery. In addition, the Social inadequacy and alienation factor of



**Figure 1.** Schematic presentation of the two structural models and standardized regression coefficients. In Model 1 financial status was treated as covariate. In Model 2 financial status was treated as a predictor of loneliness constructs and anxiety; Solid arrow represent direct path between predictor and predicted variables. Dashed arrow represents covariance; \*  $p < .05$ ; \*\*  $p < .01$ .



**Figure 2.** Schematic presentation of the combined structural model, and its standardized regression coefficients. Solid arrow represent direct path between predictor and predicted variables. Dashed arrow represents covariance; \*  $p < .05$ ; \*\*  $p < .01$ .

loneliness was associated with anxiety directly. Finally, anxiety was directly associated with pain severity.

### Loneliness

Shah *et al.* [2] maintained that “because scarcity elicits greater engagement in some problems, it leads to neglect of others.” (p. 683). Consequently, the present results can be clarified, if we explore the subscale correlations with the financial status variable. These correlations indicate that participants who perceived their financial status as below average more likely to report on emotional distress, social inadequacy and alienation, interpersonal isolation, anxiety, and high pain severity. Exceptional are growth and discovery and self-alienation, which were not associated with financial status.

Gallo and Mathews [14] observed that a large body of research demonstrated that negative emotions and attitudes predict health outcomes. It stands to reason that higher levels of loneliness will be correlated to lower financial status, except Growth and discovery, which when scarcity, or even poverty prevail, it commonly leaves little room to emotional and spiritual growth. Self-alienation was also not related to financial status, and that is contrary to expectation. While hardship and pain, especially accompanied by helplessness and hopelessness as indicated above would seem to increase loneliness in general and possibly one’s alienation from one’s suffering, the present results do not bear it out. We have no explanation for this result.

### Anxiety & pain severity

Perceived financial status (below average, average, above average) as it was negatively correlated with most measures of loneliness, as well as with anxiety and pain severity. Anxiety was positively correlated with pain severity, indicating that high anxiety levels were associated with more severe pain. Anxiety is part and parcel of being ill, and especially being struck with chronic pain, not knowing whether treatments will help to each the pain, or events will exacerbate it. Recent research confirms that personality factors like anxiety level can serve as moderators in perceived level of pain in both clinical and non-clinical populations [22,23]. Since social isolation is a serious issue for those afflicted with chronic pain, and as so many are not versed with medical terms, jargon, or understanding, it stands to reason that those whose financial status is low, and whose educational level is often similarly

low, would experience higher anxiety for not fully understanding their condition, and would report higher levels of pain as they may not be aware of various approaches of pain management, such as hypnosis, guided imagery, etc.

Although perceived financial status is associated with pain severity through anxiety Nevertheless, financial status is also associated with pain severity through emotional distress and growth and discovery. In particular, negatively perceived financial status is associated with more emotional distress and less growth, which lead to more anxiety and then to more severe pain. Furthermore, social inadequacy and alienation appears not to mediate the finance – pain association. Rather, this variable is positively associated with pain through anxiety, such that high levels of social inadequacy and alienation lead to more anxiety, which in turn lead to higher pain severity. Research has shown strong and consistent connection and mutual influence between loneliness, anxiety, and pain [24,25]. Our study indicated that low financial status, with its concomitant low awareness of medical literature, resources, and social support, has been associated with anxiety which may be rooted in one’s uncertainty and feeling of helplessness [14]. Sussman and Shafir [26] echoed it and indicated that wealth and the perception of wealth are at the core of economic behavior and well-being. Gallo and Matthews [14] offer that there is plenty of compelling evidence for the effects of depression, hopelessness, and hostility on cardiovascular morbidity and mortality and for anxiety on sudden cardiac death. We consequently suggest that those who are better off financially, score lower on loneliness measures, are less anxious as a result of their ability to understand and analyze their situation, and thus they learn how to better manage pain than those who have not. As we pointed out earlier, low SES could affect cognition negatively, and thus ill prepare the chronic pain sufferer to deal with the pain, the concomitant anxiety and the loneliness that is associated with this condition. A better financial status, more education, and a good social support system could greatly assist those suffering pain, chronic illnesses, and facing hospitalization.

### Limitations and direction for future research

The present study examined chronic pain, anxiety and loneliness from a unique perspective, that of SES level. It demonstrated the connection between these three variables. However, it relied on *perception* of SES rather than on more objective measures of that variable,

and future research may address that shortcoming. Additionally, while we examined the population of chronic pain sufferers who sought relief with the help of pain clinics, it is possible that many other sufferers do not get to those clinics, and thus were not represented in the present sample, which may affect its generalizability. We also grouped all pain sufferers together, when actually it is a pretty heterogeneous group that needs to be examined according to its illnesses, social support, and caregiving support and assistance. And lastly, the present study was carried out in Israel. It would strengthen the found relationship between the three constructs, if further research would address chronic pain sufferers in other countries and cultures.

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