

# Chronic Pain and Subjective Health in a Sample of Indonesian Adults: A Moderation of Gender

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## Abstract

Chronic pain is an essential burden for public health. Yet, evidence of its association with subjective perceptions of health in the community and gender differences is still lacking in Indonesia. This study examined how chronic pain relates to subjective health in the community and gender differences in this relationship using an Indonesian nationwide community survey. A total of 3,255 adults were involved in the study, with the mean age of the participants being 41.6 years ( $SD = 13.4$ ), with 57% identifying as female. The results revealed that chronic pain was an essential predictor of subjective health. Those who had chronic pain reported poor subjective health compared to their counterparts, regardless of their gender, education level, marital status, smoking status, unemployment status, religiosity, and extroversion personality trait. In addition, the findings showed that the negative association between chronic pain and subjective health was stronger in women than in men. This study stipulates that targeting pain in the general population and managing and treating pain might lead to improvement in public health. In addition, efforts to reduce chronic pain and to increase subjective health in the general population should be gender mindful.

## Keywords

Chronic pain; gender; Indonesia; moderation analysis; subjective health

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## Introduction

Subjective health has been recognized as a predictor of mortality and morbidity, and research has shown that it is a reliable evaluation of people's current health status (DeSalvo et al., 2006; Hita et al., 2021; Wuorela et al., 2020). This variable covers different measures of individuals' health, including physical, mental, and spiritual (Idler & Benyamini, 1997). It is then evident that self-rated health, also known as subjective health, encompasses an element that is biological, psychological, social, and functional (Damian et al., 1999). Many scholars have used clinical variables to monitor health. However, evidence has shown that self-perception variables are as reliable as clinical variables in predicting health outcomes over time (Idler & Benyamini, 1997). This means people's view of their general health predicts subsequent health outcomes (Mossey & Shapiro, 1982).

Many studies have shown the links that exist between chronic pain, health issues, and decreased functioning (Brattberg et al., 1989; Crook et al., 1984; Smith et al., 2001). Although pain is a subjective symptom, not verifiable by physicians, it is of great clinical importance because it is a common reason for seeking medical care (Mäntyselkä et al., 2001). In America, for example, it was claimed that 5% of the patients seeking primary health care had complaints of chronic pain (Hartz & Kirchdoerfer, 1987). In the United Kingdom, it was reported that 4% of sick people were looking for treatment for chronic pelvic pain (Zondervan et al., 1999). Still, in the United Kingdom, analyzing consecutive cases of a thousand consultations in primary health care, Potter (1990) reported that 40.7% of the consultations were about pain issues. In Finland, pain was the main reason for attending primary health care for 40% of the patients (Mäntyselkä et al., 2001). The chronic pain prevalence in Asian adults was found to be high, ranging between 7.1% and 61% (Mohamed Zaki & Hairi, 2015). In Indonesia, general health research reported that around 7.3% were living with chronic pain in 2018 (Ministry of Health, 2018). More recently, a study on Indonesian adults concluded that 56% of the participants had moderate pain, and 18.5 had high-intensity levels of pain (Gozan & Asih, 2021). Another study from Indonesia found a relationship between chronic pain and functional health (Yiengprugsawan et al., 2020). This evidence yields the importance of monitoring chronic pain to improve health.

The literature has established gender differences in chronic pain and subjective health. Women are more likely to have more chronic pain compared to their male counterparts (Cairns & Gazerani, 2009; Fillingim et al., 2009; Unruh, 1996). Among patients suffering from chronic pain, it was reported that women had increased musculoskeletal pain than men (Stubbs et al., 2010). Similarly, a study from Hungary found those gender differences trends, where females had more significant pain than males (Réthelyi et al., 2001). There seem to be gender differences in the perceptions of health, too. In a sample of adults, Asfar et al. (2007) claimed that female participants tended to evaluate their health poorer than male participants.

A study from Taiwan reported similar gender differences in subjective health, where female respondents had poorer self-evaluations of health compared to their male counterparts (Tsai et al., 2014). In Indonesia also, gender differences were observed in chronic pain (Yiengprugsawan et al., 2020). The Indonesian culture is family-based and collective (Kristianingrum et al., 2018) and is traditional-oriented concerning gender roles, shaping different experiences when suffering (Rahmawati & Bajorek, 2018). For example, a study reported that most women must care for suffering family members (Lukman et al., 2020). Others claimed that Indonesian women frequently perform household work, including lifting

things and working in uncomfortable positions, which increases the odds of physical pain (Sari et al., 2018). Despite this evidence in the literature, no study has examined the interaction of gender in the association of chronic pain with subjective health.

Despite their relevance, the associations between chronic pain and subjective health in the community are not addressed fully in the literature. One research from Finland designed a population-based study to investigate the impact of chronic pain on subjective health (Mäntyselkä et al., 2004). In a sample of adults aged between 15 and 74, the study concluded that chronic pain was related to poor subjective health in the community. In a prospective health study, Svedberg et al. (2006) found that pain was associated with future poor subjective health. Others have investigated this association among community-dwelling (Reyes-Gibby et al., 2002). This study discovered that pain was related to poor subjective health. However, few studies provided evidence of this relationship in the general population.

Moreover, to the best of our knowledge, no studies have addressed the links between chronic pain and subjective health in Indonesia and hypothesized a moderation of gender. Therefore, the current study aimed to contribute to the field of community health by examining the links between chronic pain and subjective health in Indonesia and exploring the interaction with gender using data from an Indonesian community survey. Our conceptual framework draws on the fact that chronic pain that limits people to do their daily activities is invalidating and, consequently, leads individuals to perceive their health as poor. As such, a negative relationship would be expected. Further, since gender differences have been reported in chronic pain and subjective health by prior research, we would also expect a moderation of gender in the relationship between chronic pain and subjective health.

## Methods

This study used the Indonesia Family and Life Survey (IFLS) data. The IFLS is a continuous sociodemographic and health survey conducted by Rand Corporation (California, United States) together with the survey METER (Yogyakarta, Indonesia) (Strauss et al., 2016). The community survey began in 1993 and has on its count five waves. The survey collected data on the individual, household, and community levels through multistage stratified sampling (Strauss et al., 2016). At the start of the survey, the households were randomly selected from three hundred twenty-one enumeration areas in thirteen Indonesian provinces (Strauss et al., 2016). The survey selected 20 households from each urban area, and from each rural area, the survey selected 30 households. In this study, we used IFLS 5. The fifth wave, held between 2014 and 2015, surveyed 16,204 households and 50,148 individuals from 311 communities aged 15 and older. The survey gave informed consent to the respondents before collecting information, and they were briefed about the intent and outcome of the survey (Strauss et al., 2016).

In this study on Indonesian adults, only participants aged between 21 and 64 were retained. In addition, the sample included only respondents who reported pain in specific parts of the body. Those who reported to have no pain were excluded. After removing all cases with missing data for all variables of interest, a sample of 3,255 individuals aged between 21 and 64 was obtained and was used in this study. The mean age of the sample was 41.6, with a standard deviation of 13.4 (Range = 21–64).

## Study variables

Subjective health served as the dependent variable in this study. Subjective health was assessed by asking, “In general, how is your health?” This question was scored on a 4-point Likert scale ranging from unhealthy to healthy (Strauss et al., 2016). The responses were recorded ordinally as follows: 1 for very unhealthy, 2 for somewhat unhealthy, 3 for somewhat healthy, and 4 for very healthy.

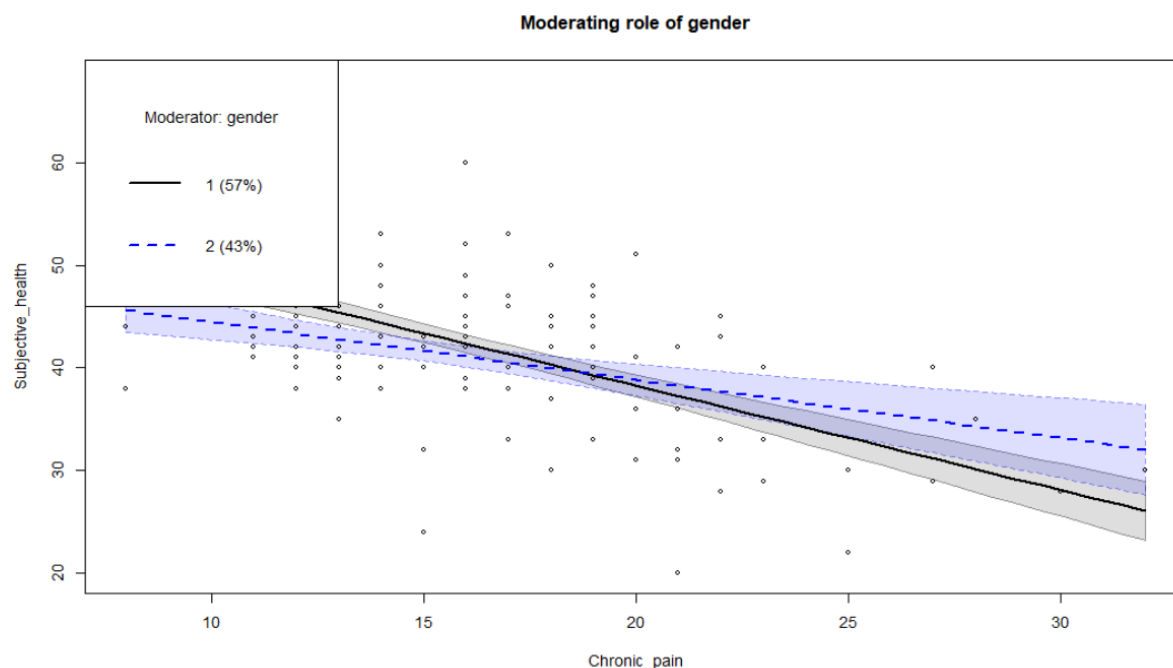
Chronic pain was the independent variable in the current study. The community survey assessed chronic pain with this question: “Yesterday, were you bothered by pain in your head, neck, shoulder, arm, wrists/finger, back/lower back, hip, knee, ankle/foot/toes, hands, legs, or buttocks?” (Strauss et al., 2016). Those respondents who answered affirmatively to this question were asked another question: “Does the pain limit your daily activities?” (Strauss et al., 2016) This question was scored on a 4-point Likert scale ranging from not at all to yes, very much so. This study recorded these responses: 0 for no, not at all, 1 for no, not too much, 2 for yes to some degree, and 3 for yes, very much so.

The study also included control variables: gender, education, age, marital status, smoking, unemployment, religiosity, and extroversion personality traits because they are related to subjective health and are available in IFLS 5. For statistical purposes, gender was dummy coded 1 for females and 2 for males. The education variable was dummy coded as follows: primary education was recorded 1, junior high school was recorded 2, senior high school was recorded 3, and high education was recorded 4. Married adults were recorded as 1, and unmarried adults were recorded as 0. Unemployed adults were recorded as 1, and employed adults were recorded as 0. Those who reported smoking were recorded as 1, while those who did not were recorded as 0. For religiosity, religious adults were recorded as 1, and not religious people were recorded as 0. For the personality traits, the survey used the extensive five inventory (Rammstedt & John, 2007), and extroversion were included in the analysis to account for personality traits as previous research showed that extroversion predicted positive health outcomes (Aiken-Morgan et al., 2014; Kööts-Ausmees et al., 2016).

## Analytical strategy

Data handling and analysis were performed using the RStudio (Posit Software, 2023). ANOVA tests and regression analysis were used for data analysis. Previous research demonstrated that these parametric statistics can be used with Likert-type data with no bias, even with non-normal distributions (Norman, 2010). Descriptive statistics and ANOVA tests were performed first. The statistical analysis included two models: Model 1 had linear regression of the independent and control variables. Model 2 added to Model 1 an interaction with gender to see the association of chronic pain with subjective health in females and males. Finally, the interaction model was plotted in Figure 1.

**Figure 1:** Graphic Representation of the Association Between Chronic Pain and Subjective Health in Females and Males



Note: 1 = females; 2 = males

## Results

Around 57% of the sample were females, and 43% were males. About 62.1% were married, and 37.9% were unmarried. Around twenty-nine had finished primary education, 27% had finished junior high school, 33% had completed senior high school, and 10.8% had high education. Around 34.8% were unemployed, 65.2% were employed, 72% were religious, and 82.9% were smokers.

The summary of the descriptive statistics of the study variables and sample characteristics and ANOVA tests are displayed in Table 1. The mean score for self-rated health was 2.89, with a standard deviation of 0.67 (Range = 1–4). The average score for chronic pain was 1.08, with a standard deviation of 0.68 (Range = 0–3). The mean score for extroversion was 7.27 ( $SD = 1.33$ ).

**Table 1:** Summary of sample characteristics and ANOVA tests ( $n = 3,255$ )

Study variables	<i>n</i>	%	Mean ( <i>SD</i> )	Mean of SRH ( <i>SD</i> )	Mean of Chronic pain ( <i>SD</i> )
<b>Subjective Health</b>	3,255		2.89 (0.67)		
<b>Chronic pain</b>	3,255		1.98 (1.08)		
<b>Age</b>	3,255		38 (13.4)		
<b>Extroversion</b>	3,255		7.27 (1.33)		
<b>Gender</b>				$p < .001$	$p < .001$
Female	1,721	52.9		2.45 (0.67)	2.05 (0.99)
Male	1,534	47.1		2.84 (0.67)	1.54 (1.01)
<b>Marital status</b>				$p = .234$	$p = .543$

Study variables	<i>n</i>	%	Mean (SD)	Mean of SRH (SD)	Mean of Chronic pain (SD)
Married	2,15	62.1		2.65 (0.67)	1.85 (0.76)
Unmarried	1,105	37.9		2.77 (0.66)	1.79 (0.45)
<b>Education</b>				<i>p</i> < .001	<i>p</i> < .01
Primary	950	29.2		2.54 (0.73)	1.90 (0.87)
Junior high school	880	27		2.49 (0.67)	1.86 (0.56)
Senior high school	1,074	33		2.85 (0.63)	1.54 (0.86)
High education	351	10.8		2.98 (0.60)	1.44 (0.76)
<b>Employment status</b>				<i>p</i> < .001	<i>p</i> = .375
Unemployed	1,134	34.8		2.65 (0.68)	1.76 (0.53)
Employed	2,121	65.2		2.95 (0.65)	1.67 (0.87)
<b>Religious</b>				<i>p</i> < .01	<i>p</i> = .375
Yes	2,343	72		2.95 (0.64)	1.67 (0.66)
No	912	28		2.80 (0.66)	1.69 (0.73)
<b>Smoking</b>				<i>p</i> < .001	<i>p</i> < .001
Yes	2,698	82.9		2.99 (0.67)	2.09 (0.34)
No	557	17.1		2.66 (0.69)	1.65 (0.76)
<b>Age</b>	3,255		38 (13.4)		
<b>Extroversion</b>	3,255		7.27 (1.33)		

Note: SD = mean and standard deviation

Gender differences were established. Male adults reported more subjective health than females, and females reported more chronic pain than males. Those respondents who had higher education reported more subjective health and less chronic pain. Those employed had higher subjective health scores, but there were no differences in chronic pain according to employment status. Those who reported being religious also reported better subjective health, but there were no differences in chronic pain according to religiosity. Surprisingly, those who reported to be active smokers had higher scores of subjective health compared to those who reported that they were not smoking. On the other hand, those who were smoking reported higher chronic pain.

The summary of the multiple regression models and the moderation analysis predicting self-rated health can be found in Table 2. In Model 1, Chronic pain was negatively related to subjective health ( $\beta = -0.42, p < .001$ ). In Model 2, the interaction with gender was also significant ( $\beta = 0.26, p < .001$ ), showing that chronic pain was negatively related to subjective health and that this relationship was stronger in females than males. These relationships were established in the presence of control variables.

**Table 2:** Summary of the Multiple Regression Models of Subjective Health and the Interaction with Gender

Variables	Model 1			Model 2		
	Coefficient	SE	<i>p</i>	Coefficient	SE	<i>p</i>
<b>Intercept</b>	2.95***	0.09	<i>p</i> < .001	3.09***	0.14	<i>p</i> < .001
<b>Chronic pain</b>	-0.42***	0.08	<i>p</i> < .001	-0.28***	0.09	<i>p</i> < .001
<b>Gender (ref. male)</b>						
Female	-0.15*	0.06	<i>p</i> < .05	-0.04	0.06	
<b>Age</b>	0.11*	0.10	<i>p</i> < .05	0.06*	0.09	<i>p</i> < .05
<b>Marital status (ref. unmarried)</b>						
Married	0.03	0.02		0.06	0.06	
Senior high school	0.06	0.03		-0.05	0.06	
High education	0.13*	0.07	<i>p</i> < .05	0.08*	0.06	<i>p</i> < .05

Variables	Model 1			Model 2		
	Coefficient	SE	<i>p</i>	Coefficient	SE	<i>p</i>
<b>Unemployment (ref. employed)</b>						
Unemployed	-0.27**	0.04	<i>p</i> < .01	-0.12**	0.04	<i>p</i> < .01
<b>Religious (ref. non-religious)</b>						
Religious	0.34***	0.06	<i>p</i> < .001	0.22***	0.02	<i>p</i> < .001
<b>Extroversion</b>	0.13*	0.05	<i>p</i> < .05	0.01*	0.00	<i>p</i> < .05
<b>Smoking (ref. non-smoking)</b>						
Smoking	-0.15**	0.06	<i>p</i> < .01	-0.09*	0.06	<i>p</i> < .05
<b>Interaction with gender</b>						
Chronic pain x gender				0.26***	0.07	<i>p</i> < .001
<b>R-Squared</b>	0.13			0.19		

Note: SE = Standard Errors

A set of control variables exhibited significant associations with subjective health as well. For example, a negative relationship was found between age and subjective health ( $\beta = -0.06, p < .05$ ). Further, better educated reported higher scores of subjective health ( $\beta = 0.08, p < .05$ ). Unemployment exhibited a negative association with subjective health ( $\beta = -0.12, p < .01$ ). Religiosity and extroversion trait were associated better self-rated health ( $\beta = 0.22, p < .001$  and  $\beta = 0.01, p < .05$  respectively).

## Discussion

Although the clinical importance of chronic pain has been established, few studies have investigated its relationship with self-rated health. This measure was found to be as reliable as clinical assessments. In addition, no study has sought to investigate this issue in Indonesia in the general population. This study was intended to explore how chronic pain is related to subjective health among Indonesian adults and to check the interaction with gender in this relationship. The main findings revealed that chronic pain was negatively associated with subjective health even after controlling for confounding variables. Those who had chronic pain tended to perceive their health as poorer than their counterparts. In addition, there were gender differences in this negative relationship between chronic pain and subjective health, where females were more impacted than males.

These results corroborate prior studies that have addressed the impact of chronic pain on self-perceptions of health in the community (Mäntyselkä et al., 2004) and among community-dwelling older adults (Reyes-Gibby et al., 2002). As subjective health covers physical, mental, and social health, previous studies have found similar results with chronic pain. In social health, for example, Ojeda et al. (2014) found in a systematic review that chronic pain had a deleterious effect on social and family environments. This was also reported by Ojeda et al., who claimed that chronic pain not only affected patients but also their families and social relations. Another study investigated links between chronic pain and health-related quality of life measured through physical, emotional, and schooling functioning among children. It showed that children with chronic pain reported significantly lower scores of health-related quality of life (Gold et al., 2009).

Similarly, in the general population in Spain, it was found that chronic pain was predictive of health-related deficits in quality of life (Langley et al., 2011). Similarly, it was found that chronic pain and mental health were highly related (Azevedo et al., 2012; Hooten, 2016).

Others also reported that the high prevalence of chronic pain was related to high levels of anxiety and depression (Jensen et al., 2016; Kroenke et al., 2013).

Chronic pain presents not only a health and well-being burden but also an economic burden. In this study, those who had chronic pain were those who reported that the pain was limiting their daily activities. It can, therefore, be argued that chronic pain was decreasing their productivity. Previous studies have suggested similar findings. A community study revealed that chronic pain was related to lost work productivity and reduced performance at work (Kawai et al., 2017). Drawing on a US Nationwide Survey, McDonald et al. (2011) revealed that arthritis, back, and fibromyalgia pain were related to high loss of productivity at work.

The negative association found between chronic pain and subjective health was stronger in women than it was in men. These gender differences were reported in previous studies, where women had higher chronic pain and poorer subjective health (Fillingim et al., 2009; Stubbs et al., 2010; Tsai et al., 2014). These gender differences might be explained by the gender differences in psychological mechanisms involved when people experience pain. Women are emotional creatures, and it has been argued that women and men manage emotions very differently (Nolen-Hoeksema & Aldao, 2011). Research has also claimed that women are more inclined to negative affectivity as they are more concerned with internal emotions and thoughts (Nolen-Hoeksema, 2012). In socialization, women are more pressed to express their emotions and feelings (Eder, 1985).

The literature has postulated mechanisms and frameworks that may explain these gender differences in the relationship between chronic pain and subjective health. From an early age, boys and girls are socialized differently about how to experience and respond to pain (Samulowitz et al., 2018). Society teaches boys toughness, pain tolerance, and sustenance of painful experiences, whereas society teaches girls to be sensitive to painful experiences and to be careful and expressive about pain (Myers et al., 2003). With an experimental study design, it was reported that those participants who had higher scores on masculinity had increased pain tolerance. In contrast, those participants with higher levels of femininity were more likely to exhibit pain sensitivity (Alabas et al., 2012).

This study found also that some of the control variables were significantly associated with self-perceptions of health. Age, education, unemployment status, religiosity, and extroversion personality traits were all associated with subjective health. As people age, they seem to rate their health as poor. Better educated report better self-rated health. Prior studies have revealed that younger and better-educated people had more chances to report better subjective health (Lietz et al., 2017). Compared with employed ones, unemployed individuals are less healthy. A study has found that employed individuals reported better perceptions of health than unemployed ones (Nayak et al., 2018). Religious individuals tend to perceive themselves as healthier than their counterparts. This was reported in previous research that religiosity was related to subjective well-being (Nizeyumukiza et al., 2020).

This study has some limitations. This study used a cross-sectional design, and no causality can be inferred. Longitudinal designs are to be used in future studies to get better insights. This study used data collected in 2015, and changes may have occurred during this time, and the results have to be interpreted bearing this in mind. Participants in this study were from the general population; future research may bring further insights with clinical samples of chronic pain. Further, this study relied on subjective chronic pain and health measures, which may be subjective to common method variance. Future research should include objective measures. The strength of the study resides in the scope of the data used.



## Conclusion

There is a lack of empirical evidence of the relationship between chronic pain and self-rated health in Indonesia in the general population. A negative association was established between chronic pain and subjective health in Indonesia in the community. Chronic pain presents a global burden on health. Managing chronic pain in the community is essential to improve public health. This study stipulates that there must be lots of individuals who are living with untreated chronic pain and that controlling and managing pain well might contribute to the improvement of subjective health in the general population.

Moreover, this would increase productivity because the pain limited their daily activities. This study found gender differences in this association. Therefore, efforts to decrease chronic pain and to increase subjective health in the general population should be gender mindful.

## Policy implications

The findings of this study present some policy implications. First, this study provided evidence that chronic pain is health-invalidating. Thus, policymakers in public health need to plan large-scale programs to treat and mitigate chronic pain in the Indonesian community. Second, these programs need to be gender mindful since the impact of chronic pain on subjective health is different for females and males. Third, local community-level programs can also be implemented, such as raising awareness of physical activity to mitigate the pain.

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