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Application of the Health Belief Model for Assessing Risk Behavior among Patients Experiencing Musculoskeletal Pain Treated with Acupuncture in Surakarta

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ABSTRACT

Background: Musculoskeletal pain is a complaint that occurs in parts of the skeletal muscles which is felt by a person ranging from mild complaints to very painful. This study aimed to analyze the effects of perceived vulnerability, perceived benefits, perceived barriers, and self-efficacy on risky behavior in patients complaining of musculoskeletal pain treated with acupuncture.
Subjects and Method: This was a cross-sectional study conducted in Surakarta, from November-December 2023. A total of 200 patients were selected using fixed disease sampling. The dependent variable was risk behavior for musculoskeletal pain. The independent variables were perceived vulnerability, perceived vulnerability, perceived benefits, perceived barriers, cues to action, and self-efficacy. The data were analyzed using a multiple linear regression.
Results: Musculoskeletal pain risk behaviors (MSDs) decreased with increasing perceived susceptibility (b= -0.22; 95% CI= -0.29 to -0.16; p<0.001), perceived benefit (b= -0.09; 95% CI= -0.13 to -0.05; p<0.001), and self-efficacy (b= -0.06; 95% CI= -0.11 to -0.01; p=0.015) and increased with increasing perceived barriers (b= 0.05; 95% CI= 0.02 to 0.09; p= 0.002).
Conclusion: Perceived vulnerability, perceived benefits, and self-efficacy decrease risk behavior in musculoskeletal pain patients, and perceived barriers increase risk behavior in musculoskeletal patients.

Keywords: Health belief model, musculoskeletal pain, acupuncture

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BACKGROUND

Pain is an unpleasant sensory and emotional experience resulting from tissue damage, either actual or potential or described in the form of such damage (Srinivasa et al, 2020). Pain is a multidimensional sensory experience. These phenomena can vary in intensity (mild, moderate, severe), quality (dull, burning, sharp), duration (transient, intermittent, persistent), and spread (superficial or deep, localized or diffuse). Although pain is a sensation, it has cognitive and emotional components, which are described as a form of suffering (Bahrudin et al, 2017).

Musculoskeletal pain is a complaint in the parts of the skeletal muscle (skeletal) which is felt by a person ranging from very mild complaints to very painful, if the muscles receive static loads repeatedly for a long time it can cause complaints in the form of damage to the joints, ligaments and tendons. on the back, shoulders, hands and neck. These complaints are what are called musculoskeletal complaints or Musculoskletal Disorders (MSDs) or injuries to the musculoskeletal system. Musculoskeletal pain is a multifactorial condition, it involves complex interactions between structural, physical, psychological, social, lifestyle and comorbid health factors. (Caneiro et al, 2021).

The Health Belief Model theory contains several main concepts that predict why people will take action to prevent, screen for, or control disease conditions (Al-Metwali, 2021). In the end, the actions a person takes often depend on the perceived benefits and barriers related to healthy behavior (Sudirman et al., 2023). In the Health Belief Model there is still much to be explained by factors that support and strengthen a person's behavior, and these factors become increasingly important when the model is used to explain and predict more complex lifestyle behaviors that need to be maintained throughout life (Sudirman et al., 2023; Al-Metwali, 2021).

In the city of Surakarta at the end of March 2023, it was found that 20 drivers on BST buses in the city of Surakarta experienced moderate complaints, and 5 people experienced severe complaints. This finding was accompanied by awkward postures on the part of the drivers. From these findings, the author is interested in conducting research on factors associated with the incident of musculoskeletal disorders in Surakarta BST bus drivers. (Jaya & Porusiana, 2023).

This study aims to analyze the effects of perceived vulnerability, perceived benefit, perceived barrier, and self-efficacy on risky behavior in patients complaining of musculoskeletal pain treated with acupuncture

SUBJECTS AND METHOD

1. Study Design

The study design used in this research is observational analytic with a cross-sectional approach. This research was conducted in Surakarta City from November to December 2023.

2. Population and Sample

The population in this study were patients with complaints of musculoskeletal pain in the city of Surakarta and the sample in this study was 200 patients with complaints of musculoskeletal pain selected using Fixed Disease Sampling.

3. Study Variable

The dependent variable was musculoskeletal pain risk behavior. The independent variables were perceived vulnerability, perceived vulnerability, perceived benefit, perceived barrier, cues to action, and self-efficacy.

4. Operational Definition

Risky behavior is behavior that can endanger a person's psychosocial perspective of development and growth. Several risky behaviors can increase the likelihood of Musculoskeletal Disorders (MSDs).

Perception of Vulnerability is someone who feels confidence/trust in the possibility of illness happening to them

Benefit Perception Is an individual's perception regarding the perceived benefits or advantages

Perceived Barriers are individual or group perceptions about barriers to implementing healthy behavioral habits.

Self-efficacy is a person's ability or self-confidence to be successful in carrying out an action.

5. Instruments

This research was conducted using a questionnaire created by the author. The validity and reliability tests were carried out. The method for filling out the questionnaire uses the interview method.

6. Data Analysis

In this study, univariate analysis, bivariate analysis and multivariate analysis were carried out using linear regression analysis. Data analysis using the STATA 17 application.

7. Research Ethics

This research has received a certificate of ethical suitability from RSUD Dr. Moewardi with letter number 444/II/HREC/2024.

RESULTS

1. Univariate Analysis

Univariate analysis showed that in the risk behavior variable, the 200 research subjects had an average of 2.32 and a standard deviation value of 0.73 with the smallest point being 0 and the largest point being 5. In the perception of vulnerability variable, the 200 research subjects had an average of 1.65 and a standard deviation value of 1.38 with the smallest point being 0 and the largest point being 6. In the perceived benefits variable, 200 research subjects had an average of 4.77 and a standard deviation value of 2.11 with the smallest point being 0 and the largest point being 9. In the perception of barriers variable, 200 research subjects had an average of The average value is 5.24 and the standard deviation value is 2.52 with the smallest point being 0 and the largest point being 10. In the self-efficacy variable, the 200 research subjects have an average value of 2.32 and a standard deviation value of 1.75 with the smallest point being 0 and the largest point being 5.

Table 1. Results of Univariate Analysis of the Health Belief Model Application on risk behavior in musculoskeletal pain patients

Variable	N	Mean	Std. Dev	Min	Max
MSDs Risk Behavior	200	2.83	0.73	2	5
Perception of Vulnerability	200	1.65	1.38	0	6
Perception of Benefits	200	4.77	2.11	0	9
Perception of Barriers	200	5.24	2.52	0	10
Self-Efficacy	200	2.32	1.75	0	5

2. Bivariate Analysis

Bivariate analysis in this study was carried out using a t-test of perceived vulnerability, perceived benefits, perceived barriers, and self-efficacy for Musculoskeletal disorder risk behavior.

Based on the results of the t-test, high perception of vulnerability (Mean= 2.54; SD= 0.58) with low perception of vulnerability (Mean=3.11; SD=0.76) shows that someone with a high perception of vulnerability can reduce risk behavior for Musculoscletal Disorders (MSDs) and statistically significant (p<0.001)

The t-test results of high perceived benefits (Mean=2.69; SD=0.67) with low perceived benefits (Mean=3.20; SD=0.75) show that someone with high perceived benefits can reduce risk behavior for MSDs and is statistically significant (p <0.001).

The t-test results of high perceived barriers (Mean=2.93; SD=0.80) with low perceived barriers (Mean=2.66; SD=0.56) show that someone with high perceived barriers can increase risk behavior for Musculoskletal Disorders (MSDs) and significantly statistically significant (p=0.012)

The t-test results of high self-efficacy (Mean=2.73; SD=0.72) with low self-efficacy (Mean=3.01; SD=0.72) show that someone with high self-efficacy can reduce risky behavior for Musculoscletal Disorders (MSDs) and is statistically significant (p<0.001).

Table 2. Results of bivariate analysis of the health belief model application on risk behavior in musculoskeletal pain patients

Variable	n	Mean	SD	P
Perception of Vulnerability	**200**			
Low (score<2)	102	3.11	0.76	<0.001
High (score≥2)	98	2.54	0.58	
Perception of Benefits	**200**			
Low (score<5)	56	3.20	0.75	<0.001
High (score≥5)	144	2.69	0.67	
Perception of Barriers	**200**			
Low (Score<5)	74	2.66	0.56	0.012
High (Score≥5)	126	2.93	0.80	
Self-Efficacy	**200**			
Low (score<2)	69	3.01	0.72	<0.001
High (score ≥2)	131	2.73	0.72	

3. Multivariate Analysis

Multivariate analysis shows the results of multiple linear regression analysis regarding the Health Belief Model construct that influences Musculoscletal Disorders (MSDs) risk behavior.

There is a negative relationship between perceived vulnerability and MSDs risk behavior. Patients with MSDs with high perceived vulnerability had lower odds of risk behavior than those with low perceived vulnerability (b= -0.22; 95% CI= -0.29 to -0.16; p<0.001).

There is a negative relationship between perceived benefits and risk behavior of MSDs. Patients with MSDs with high perceived benefits had lower odds of risk behavior than those with low perceived benefits (b= -0.09; 95% CI= -0.13 to -0.05; p<0.001).

There is a positive relationship between perceived barriers and MSDs risk behavior. Patients with MSDs with high perceived barriers had a higher likelihood of risky behavior than those with low perceived barriers (b= 0.06; 95% CI= 0.02 to 0.09; p=0.002).

There is a negative relationship between self-efficacy and MSDs risk behavior. Patients with MSDs with high self-efficacy had a lower likelihood of risky behavior than low self-efficacy (b= -0.06; 95% CI= -0.11 to -0.01; p=0.015).

This linear regression analysis model has Adj R-squared = 30.44%. This means that the four independent variables in this model together are able to explain variations in risk behavior for MSDs by 30.44%.

Table 3. Results of multivariate analysis of the health belief model application on risk behavior in musculoskeletal pain patients

Independent Variable	Coefficient (b)	CI 95%		p
		Lower Limit	Upper Limit	
Perception of Vulnerability	-0.22	-0.28	-0.16	<0.001
Perception of Benefits	-0.09	-0.14	-0.05	<0.001
Perception of Barriers	0.06	0.02	0.09	0.002
Self-efficacy	-0.06	-0.11	-0.01	0.015
N Observations= 200				
Adjusted R-Squared= 0.3044				
p<0.001				

DISCUSSION

1. The influence of perceived vulnerability on MSDs risk behavior

In this study, it was found that there was a negative influence from the perception of high vulnerability on risky behavior for MSDs. Someone with a high perception of vulnerability has a lower likelihood of behaving at risk of MSDs. Conversely, someone with a low perceived vulnerability has a higher likelihood of risky behaviors for Musculoscletal Disorders (MSDs).

Ryu et al (2014) in a study regarding the influence of perception on the incidence of MSDs stated that someone with a high perception of vulnerability to pain if they are affected by MSDs, that person will do things that prevent themselves suffer from MSDs such as doing physical exercise during holidays, stretching between work, etc. This is what makes perceptions of vulnerability and risk behavior for MSDs have a negative relationship.

According to Kim, et al (2021) stated that the perception of vulnerability to MSDs can make changes to the intensity of working hours which is one of the factors in the emergence of MSDs in a person. Someone with a high perception of vulnerability or severity tends to choose to reduce the intensity of working hours in the desire to avoid Musculoskeletal Disorders.

2. The influence of perceived benefits on MSDs risk behavior

In this study, it was found that there was a negative influence between the perception of high benefits on risk behavior for MSDs. A person with a high perceived benefit has a lower likelihood of behaving at risk of MSDs. On the other hand, someone with a low perceived benefit has a higher risk of behaving at risk of MSDs.

According to Ogunrinde et al (2021) stated that the perception of benefits that exist within a person makes that person have the desire to do this in the hope that they can experience this useful thing and it can be useful for themselves. The perception of benefits cannot arise by itself, but requires several stages to create the perception of benefits.

3. The influence of perceived barriers on MSDs risk behavior

In this study, it was found that there was a positive influence between high perceived barriers and high risk behavior for MSDs. A person with high perceived barriers has a higher likelihood of risky behaviors for MSDs. On the other hand, someone with a low perception of barriers has a lower likelihood of engaging in risky behavior for MSDs.

This study is in line with Weale et al (2022) which states that the perception of obstacles that exist within a person gives rise to feelings of doubt and fear in a person

in carrying out behavior that avoids the occurrence of MSDs in that person. It was further explained that some of the obstacles that exist within a person are obstacles that they are unable to overcome even though they are aware of these obstacles so they feel they do not have the ability to overcome these obstacles.

4. The influence of self-efficacy on MSDs risk behavior

In this study, it was found that there was a negative influence between high self-efficacy and risky behavior for MSDs. Someone with high self-efficacy has a lower likelihood of behaving at risk of MSDs. On the other hand, someone with low self-efficacy has a higher risk of behaving at risk of MSDs.

This study is in line with Block and Keller (1997) who state that self-efficacy theory states that the process of psychological change occurs through modifying people's expectations regarding their ability to overcome these problems. Perceptions of self-efficacy influence whether the behavior is feasible and how much effort must be put into carrying out the effort.

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This study is self-funded.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

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