

The Effect of Neuropathic Pain on Psychological Well-Being of An Individual

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Abstracts: This comprehensive study delves into the intricate relationship between neuropathic pain and psychological well-being among individuals while exploring the multifaceted influences of pain severity, gender, socio-economic class, and potential gender-based disparities. Employing a cross-sectional design, data were meticulously gathered from a sample of 110 participants within a medical facility. To assess neuropathic pain and psychological well-being, the study thoughtfully employed self-report measures, notably the DN4 Questionnaire for pain assessment and the Satisfaction with Life Scale for evaluating psychological well-being. The findings of this study unveiled a robust and statistically significant negative correlation between neuropathic pain and psychological well-being ($r = -0.87$, $p = 0.02$). This compelling correlation indicates that as the severity of neuropathic pain escalates, psychological well-being tends to markedly diminish. This relationship was further corroborated through linear regression analysis, demonstrating that for each incremental unit increase in neuropathic pain, there is a corresponding decrease of 0.87 units in psychological well-being ($p = 0.001$). Furthermore, this study unearthed noteworthy negative correlations between neuropathic pain and distinct domains of life, encompassing general activity, mood, normal work, relationships, sleep and enjoyment in life. These correlations illuminate that as the severity of neuropathic pain intensifies, individuals encounter impediments in various facets of their lives, including their daily activities, emotional states, work performance, social interactions, sleep quality, and overall life satisfaction. Notably, the socio-economic class emerged as a salient factor influencing well-being, with individuals in the middle class exhibiting significantly higher well-being scores when compared to their counterparts in the lower socioeconomic class ($F = 5.770$, $p = 0.004$). Intriguingly, gender did not wield a substantial impact on either well-being or pain levels in this study's context. The profound implications of these findings underscore the imperative necessity for the development and implementation of comprehensive pain management strategies, as well as robust psychosocial support systems tailored to individuals grappling with neuropathic pain. Future avenues of research should consider adopting longitudinal study designs to gain insights into the evolution of these relationships over time and should also explore nuanced cultural and gender-related factors that might further elucidate the complex interplay between pain experiences and psychological well-being.

Keywords: Neuropathic Pain, Psychological Well-Being, Pain Severity, Socio-Economic Class, Gender Disparities.

1. INTRODUCTION

Since the definition of pain envelopes, the concept of personal experience, the neuropathic pain is all the more complicated due to involvement of multiple factors in its development and can be regarded as a syndrome more than as an isolated illness (Jensen, 2011). The development of the definition of neuropathic pain has reached a conclusion to attribute the neuropathies to a lesion in the somatosensory nervous system and not just any lesion anywhere in the central or peripheral nervous system (Jensen, 2011) (Haanp, 2011). According to studies 7-10% of the general population gets affected by neuropathic pain (Colloca, 2017). Since it's believed that neuropathic pain is resistant to treatment (Zilliox, 2017), it's all the more important to study the effect of this pain on the quality of life (Baron, 2010). Studies report different factors as the cause of impairment of quality of life in patients suffering from neuropathic pain (Colloca, 2017). Comorbidities like diabetes mellitus, viral infections, and autoimmune diseases can lead to development of neuropathies (Campbell, 2006). In addition to research on pathophysiological mechanisms and pharmacological therapies, psychological assessment and multidisciplinary team effort to treat the neuropathies is essential (Baron, 2010) (Zilliox, 2017). Most of the work done in this area focuses on the quantitative studies of neuropathic pain and the need for qualitative studies has been overlooked (Haanp, 2011). There remains a still bigger need for translational research (Backonja, 2003), which cannot achieve its purpose

without taking into account the psychological well-being of the patients. Qualitative studies using focal groups highlight the significance of addressing the psychological well-being of patients suffering from neuropathies as the most crucial step in alleviating their symptoms and addressing their concerns (Hearn, 2015). The psychological well-being of a person cannot be defined without taking into account the linkage between the mind and the body (Ryff, 1996), and thus the effect of neuropathic pain in this context remains foremost, to be considered when addressing psychological well-being of a person. Hence the present study looks into the effects of the neuropathic pain on the psychological well-being of the patients and attempts to fill the gap in research on neuropathic pain.

2. LITERATURE REVIEW

It was believed that any lesions in the central or peripheral nervous system could be the cause of neuropathic pain (Jensen M. P., 2007). It was also proposed that in a neuropathy, A β , A δ and C fibres of the peripheral nerves were affected in addition to disturbances in the excitation and inhibition pathways of the somatosensory system (Colloca, 2017). Some studies estimate the prevalence of the neuropathic to be 7-10% (Colloca, 2017), while others suggest that up to one-sixth of the population is affected by neuropathic pain (Campbell, 2006). It is believed that the incidence might actually increase because of prolonged life spans, global increase in aging population and increased incidence of comorbid conditions (Colloca, 2017). Neuropathies which have different etiologies present with similar symptoms (Backonja, 2003). Clothing touching the skin and light stroking of the skin resulting in increased pain, decreased sensitivity to touch in some areas of the skin and or burning sensation on the skin are all examples of neuropathic pain (Campbell, 2006) (Bridges, 2001). Neuropathic pain is resistant to treatment (Zilliox, 2017), and affects the quality of life (Baron, 2010). The pharmacological options for treating this pain revolve around anti-depressants and some anti-epileptics more than the conventional analgesic drugs (Bridges, 2001). There is lack of large randomized controlled trials to fully understand the possible management of chronic and neuropathic pain (Gierthmhlen, 2016).

The neuropathic pain is exclusive in persisting despite treatment with anti-inflammatory agents, and in having positive and negative sensory and autonomic phenomena (Backonja, 2003). In addition to this complicated mechanism, not just the treatment becomes more elusive but compounded with lack of data on psychosocial and psycho bio-social effects of neuropathic pain, the matter is further complicated, and it becomes more difficult to achieve patient satisfaction (Backonja, 2003).

The psychological well-being of a person is about the association between mind and body (Ryff, 1996). Since as far back as 1978, the studies of psychological well-being of a person have taken into account the role of health, and the effect of presence or absence of any chronic illness/pain on the overall psychological well-being and happiness of an individual (Warr, 1978). In the later years the psychologists converged on seeing the psychological well-being more through the lens of positive functioning of an individual than taking into account the fundamental pillars of physical health (Ryff C. D., 1989). Researchers like Barr took psychological well-being to another dimension by wholly focusing on the mental aspects of existence and overlooking the physical component of unrestricted mobility and existence (Bar-On, 1988). This fact was clearly pointed out by Ryf et al., later on and the importance of physical health was considered undeniable for psychological well-being models constructed by the psychologists and other mental health practitioners (Ryff, Carol D and Keyes, Corey Lee M, 1995). Wang elaborated on it further by considering the psychological models of well-being, merely subjective and emphasizing on the importance of addressing the physiological and social aspects, when discussing the psychological well-being (Wang, 2012).

Studies done before the year 2000 have in all addressed the importance of psychological well-being, in picture of neuropathies but the methods used to gauge the functioning and the "well-being" have been variable and lack structured organization of the assessment (Jensen M. P., 2007). Biopsychosocial models have been developed to address physical, emotional and social functioning of patients in addition to improving their quality of sleep and global quality of life in the wake of neuropathic ailments (Jensen M. P., 2007). It has been proposed that for a more holistic approach to pain relief in the context of neuropathic pain in particular qualitative studies on sleep, psychological well-being and quality of life should be done (Haanp, 2011)

The mainstay of most of the studies on neuropathic pain has been the effort to understand the psychophysiology of neuropathic to better treat the pain (Woolf, 1999).

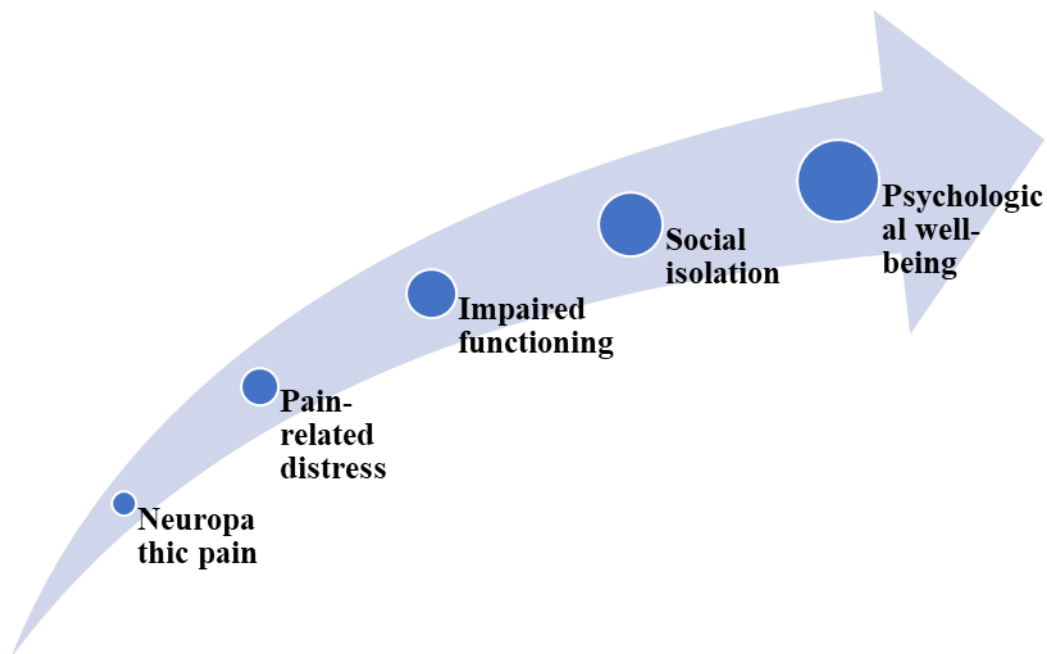
Studies done at length on the impact of mindfulness on chronic pain conditions which may or may not be neuropathological supports the idea that psychological well-being of patients suffering from neuropathies is still an untapped area of research (Geiger, 2016). Various scales have been used to assess the health-related quality of life (HRQoL) of patients with neuropathies and the need to address different domains in this regard has been highlighted in the studies (Jensen M. P., 2007).

3. THEORETICAL MODEL

The model proposes that neuropathic pain acts as a chronic stressor that triggers physiological and psychological responses, disrupting the individual's overall well-being. Previous studies have shown that chronic pain, such as neuropathic pain, can lead to stress, anxiety, and depression (Bair et al., 2003). The model suggests that specific psychological processes mediate the relationship between neuropathic pain and psychological well-being. Chronic pain can give rise to negative cognitive appraisals, such as catastrophizing and rumination (Sullivan et al., 2001). These maladaptive thought patterns can intensify pain perception and contribute to the decline in psychological well-being. Individuals employ various coping strategies to manage their neuropathic pain. However, the effectiveness of these strategies may vary, potentially impacting their psychological well-being. Maladaptive coping mechanisms, including avoidance and self-medication, have been associated with poorer psychological outcomes (Senturk, Diener, & Sjoberg, 2017), while adaptive coping strategies, such as cognitive-behavioral techniques, have shown positive effects on psychological well-being (Jensen et al., 2011).

The model suggests that certain moderating factors can influence the relationship between neuropathic pain and psychological well-being. Adequate social support, including emotional, informational, and instrumental assistance, has been found to buffer the negative effects of pain on psychological well-being (Schulz et al., 2004). Conversely, a lack of social support may contribute to greater psychological distress. Certain personality traits, such as resilience and optimism, may influence how individuals perceive and cope with neuropathic pain. For instance, individuals with higher levels of resilience tend to adapt better to chronic pain, leading to improved psychological well-being (Smith et al., 2008).

The following theoretical model illustrates the complex relationship between neuropathic pain and psychological well-being:



This model suggests that neuropathic pain can have a negative impact on psychological well-being through a number of indirect pathways. For example, pain-related distress can lead to impaired functioning, which can lead to social isolation, which can ultimately lead to decreased psychological well-being.

The model also suggests that there are a number of factors that can moderate the relationship between neuropathic pain and psychological well-being. For example, people with strong social support networks may be more resilient to the negative effects of neuropathic pain on their psychological well-being.

3.1. Significance of Study

significance of this study lies in its comprehensive exploration of the relationship between neuropathic pain and psychological well-being among individuals, considering various factors such as pain severity, gender, socio-economic class, and specific domains of life. It addresses several research gaps and contributes to both clinical understanding and potential interventions for individuals suffering from neuropathic pain:

Confirming the Link between Neuropathic Pain and Psychological Well-being: This study reaffirms and strengthens the existing evidence regarding the negative correlation between neuropathic pain and psychological well-being. By employing rigorous quantitative methods, it provides robust support for the idea that as neuropathic pain severity increases, psychological well-being tends to decrease significantly

Quantitative Assessment of Specific Life Domains: Unlike some previous research that primarily focused on overall well-being, this study delves into the specific domains of life affected by neuropathic pain. It identifies significant correlations between pain severity and general activity, mood, normal work, relationships, sleep, and enjoyment in life. This granularity adds depth to our understanding of how neuropathic pain impacts an individual's daily life and emotional state.

Socio-economic Class and Well-being: By examining the influence of socio-economic class on well-being, the study highlights the potential role of social determinants in shaping the well-being outcomes of individuals with neuropathic pain. This aspect of the research is particularly relevant for policy-makers and healthcare providers looking to address health disparities and tailor interventions to specific populations.

This study contributes significantly to the field by deepening our understanding of how neuropathic pain affects psychological well-being, shedding light on the role of socio-economic factors, challenging gender assumptions, and providing actionable recommendations for future research and clinical practice. It underscores the urgency of addressing neuropathic pain as a complex and multifaceted health issue that requires a multidisciplinary approach.

3.2. Research Objective

- Investigate the relationship between neuropathic pain and psychological well-being in individuals, assessing whether neuropathic pain is associated with decreased psychological well-being.
- Examine the correlation between the severity of neuropathic pain and the degree of impairment in psychological well-being, exploring if increased pain severity corresponds to decreased psychological well-being.
- Explore the moderating role of gender in the relationship between neuropathic pain and psychological well-being, considering potential gender differences in the impact of pain on mental health.
- Assess the interference of neuropathic pain in an individual's daily activities, aiming to understand how pain affects general functioning.

- Investigate the broader consequences of neuropathic pain, including its impact on mood, relationships, sleep, and overall enjoyment of life, to provide a holistic view of its effect on individuals' well-being.

4. METHODS AND MATERIAL

4.1. Study Design

This cross-sectional study aimed to investigate the effect of neuropathic pain on the psychological well-being of individuals. The research was conducted at Shifa International Hospital, Islamabad, in accordance with the Institutional Review Board (IRB) guidelines. The study commenced in January 2023 and concluded in August 2023. Data collection took place at the Pain Clinic of Shifa International Hospital.

4.2. Participants

A total of 110 participants, including both males and females, were recruited for this study. The age range of the participants was from 18 to 70 years. Participants were selected from diverse socio-economic backgrounds to ensure a representative sample. The sample size was determined using G Power.

4.3. Data Collection Instruments

A quantitative survey was employed as the primary data collection method. The questionnaire administered to participants consisted of two main sections: The first section collected demographic information from the participants to ensure a comprehensive understanding of the sample. The Satisfaction with Life Scale (SWLS): The SWLS is a widely-used psychological tool developed by Diener, Emmons, Larsen, and Griffin. It measures an individual's overall satisfaction and contentment with life through five statements rated on a 7-point Likert scale. The SWLS assesses both cognitive and affective aspects of life satisfaction, including how close one's life is to their ideal and their general satisfaction with life. This scale is reliable and valid, used in various fields including clinical and positive psychology, as well as cross-cultural studies. Higher SWLS scores are associated with positive outcomes such as better mental health, self-esteem, resilience, and overall well-being (Pavot, W., & Diener, E. 1993). The DN4 Questionnaire developed by Bouhassira, D. et. al. (2005), the DN4 questionnaire is a medical tool used to assess neuropathic pain. The DN4 questionnaire comprises ten questions divided into two sections. The first section consists of seven questions focusing on sensory abnormalities to distinguish neuropathic from non-neuropathic pain. The second section contains three questions assessing signs indicative of nerve damage. Each question is scored from 0 to 10, with higher scores indicating more severe symptoms. The total score, ranging from 0 to 38, helps diagnose neuropathic pain.

4.5. Procedure

The data collection procedure for this study commenced after obtaining ethical approval from the Institutional Review Board (IRB) of Shifa International Hospital. Initially, a pilot study was conducted involving 10 participants to assess the feasibility of the research and the effectiveness of the questionnaire. This preliminary investigation served to refine the research design and ensure that the questionnaire adequately captured the pertinent information from participants. The research site chosen was the Pain Clinic of Shifa International Hospital, where well-trained psychologists obtained informed consent from each participant. Subsequently, participants were provided with the questionnaire to complete, and any concerns or questions were addressed by the researchers. Strict protocols were implemented to guarantee the privacy and confidentiality of the participants throughout the data collection process, and all data were documented meticulously in compliance with ethical standards.

4.6. Data Analysis

The collected data underwent comprehensive analysis using IBM SPSS Statistics version 25. This included descriptive statistics for summarizing data, regression analysis to explore variable relationships, correlation analysis

to measure associations, t-tests for group comparisons, and normality tests to assess data distribution, ensuring a rigorous and thorough examination of the dataset.

5. RESULTS

This chapter unveils the outcomes of our study investigating the nexus between neuropathic pain and an individual's psychological well-being. Utilizing the Satisfaction with Life Scale (SWLS) to gauge well-being and the DN4 Questionnaire to assess neuropathic pain, our study featured a sample size of 110 participants. The forthcoming sections elucidate the implications and insights drawn from these measures, unveiling the profound impact of neuropathic pain on psychological well-being in our cohort.

Table1: Descriptive statistic of demographics(N=110)

Variables	F	%
Gender		
Male	63	39.1
Female	67	60
Marital Status		
Single	70	63
Married	40	36
Education		
Without formal education	21	19.1
Undergraduate	60	54.5
Graduate	29	26.4
Age category		
Early Adult (20-39 years)	86	78.2
Middle Adult (40-59 years)	17	15.5
Old (60+ years)	7	6.4
Socio-economic status		
Lower class	11	10
Middle class	84	76.4
Upper class	15	13.6
Severity of Neuropathic Pain		
Mild	38	34.5
Moderate	49	44.5
Severe	23	20.9

Note: f=frequency, %= percentage

The data presented in table 1 comprises various variables and their respective percentages. Gender-wise, the distribution indicates that 39.1% of the participants are male, while 60% are female. In terms of marital status, 63% are single, and 36% are married. Regarding education, 19.1% have no formal education, 54.5% are undergraduates, and 26.4% are graduates. Age categories are also represented, with 78.2% falling into the Early Adult group (20-39 years), 15.5% in the Middle Adult group (40-59 years), and 6.4% classified as Old (60+ years). Socio-economic status is divided into Lower class (10%), Middle class (76.4%), and Upper class (13.6%). Lastly, the severity of neuropathic pain is assessed based on the DN4 questionnaire, where a score of 4 or less indicates mild pain, 5 to 7 indicates moderate pain, and a score exceeding 7 signifies severe pain. The data shows that 34.5% of participants experience mild pain, 44.5% have moderate pain, and 20.9% endure severe neuropathic pain.

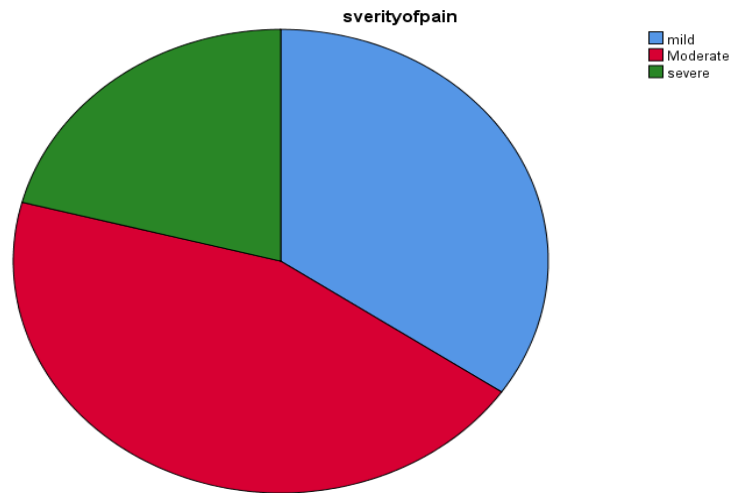


Figure 1

5.1. Psychometric Properties of the Instrument

Cronbach’s alpha finding was used to check the reliability of satisfaction with life scale and DN4 Questionnaire. Descriptive statistics are used to find the mean and standard deviation.

Table 2 Cronbach’s Alpha and descriptive statistics of satisfaction with life scale and DN4 Questionnaire (N=110).

	M	S.D	Skewness	Kurtosis	Cronbach’s α
DN4 Questioner	5.8	1.9	.54	-.79	.86
SWLS	20.2	7.8	-.08	-.74	.88

Note: M= mean, S.D= standard deviation, SWLS= Satisfaction with life scale

Table 2 includes descriptive statistics for two different scales: the DN4 Questionnaire and the SWLS (Satisfaction with Life Scale). For the DN4 Questionnaire, the mean score (M) is 5.8, with a standard deviation (S.D) of 1.9. The skewness is positive at 0.54, indicating a slight rightward or positive skew in the data distribution. The kurtosis is negative at -0.79, suggesting that the distribution is slightly less peaked than a normal distribution. The Cronbach’s alpha reliability coefficient for this questionnaire is 0.86. On the other hand, for the SWLS, the mean score (M) is 20.2, with a standard deviation (S.D) of 7.8. The skewness is close to zero at -0.08, indicating a relatively symmetrical distribution. The kurtosis is negative at -0.74, suggesting a slightly less peaked distribution compared to normal. The Cronbach’s alpha reliability coefficient for the SWLS is 0.88. It’s important to note that both scales exhibit excellent internal consistency as indicated by their Cronbach’s alpha values, which exceed the threshold of 0.7. This demonstrates a high degree of reliability and consistency in the measurements obtained from these scales.

5.2. Correlation Between Neuropathic Pain Psychological Well-Being

Table 3 Correlations

		Neuropathic pain	Psychological wellbeing
Neuropathic pain	Pearson Correlation	1	-.87
	Sig. (2-tailed)		.02
	N	110	110
Psychological wellbeing	Pearson Correlation	-.87	1
	Sig. (2-tailed)	.02	
	N	110	110

The correlation analysis between neuropathic pain and psychological well-being reveals a strong negative relationship between the two variables. The Pearson correlation coefficient for neuropathic pain and psychological well-being is -0.87. This negative correlation signifies that as the severity of neuropathic pain increases, psychological well-being tends to decrease. The p-value associated with this correlation is 0.02, indicating that the observed negative correlation is statistically significant. In summary, the data shows a noteworthy negative correlation between neuropathic pain and psychological well-being, implying that higher levels of neuropathic pain are associated with lower levels of psychological well-being in the study population.

5.3. Neuropathic Pain Predict Psychological Well-Being

Table 4 Simple linear regression to assess the predictive role of neuropathic pain on psychological well-being of an individual (N=110)

Variables	B	SE	T	p
Constant	19.9	2.3	20.37	.000
Neuropathic pain	-0.87	.38	-3.43	.001
R ²	0.31			

Note. B= unstandardized beta, S.E= standard error, p= significance level;

A simple linear regression analysis was conducted to evaluate the predictive relationship between neuropathic pain and an individual's psychological well-being. The results indicate that the constant term in the model is 19.9, with a standard error (SE) of 2.3. The associated t-statistic for the constant is 20.37, and the p-value is extremely low ($p < 0.001$), indicating that the intercept is statistically significant. Regarding the predictor variable, neuropathic pain, the coefficient (B) is -0.87, with a standard error of 0.38. The t-statistic for neuropathic pain is -3.43, and its p-value is also highly significant ($p = 0.001$). The coefficient of determination (R^2) for this regression model is 0.31, suggesting that approximately 31% of the variance in psychological well-being can be explained by the linear relationship with neuropathic pain. Additionally, the F-statistic for the model is 0.025 F-value indicates the overall significance of the regression model. In the context mentioned, it could imply that the model is statistically significant. Therefore, it can be inferred that for every 1-unit increase in neuropathic pain, there is a corresponding decrease of 0.87 units in psychological well-being, and this relationship is statistically significant.

5.4. Intern Correlation Between Neuropathic Pain and Difference Life Aspect Of An Individual

Table 5 Intercorrelation between neuropathic pain and general activity, mood, normal work, relationship, sleep and enjoyment in life of an individual (N=110)

	1	2	3	4	5	6	7
Neuropathic Pain	-	-	-	-	-	-	-
General Activity	-.20**	-	-	-	-	-	-
Mood	-.29**	-.85**	-	-	-	-	-
Normal work	.16	-.87**	-.88**	-	-	-	-
Relationship	-.24**	-.76**	-.86**	-.84**	-	-	-
Sleep	-.22**	-.81**	-.80**	-.86**	-.72**	-	-
Enjoyment in life	-.21**	-.66**	-.72**	-.72**	-.74**	-.70**	-

Note= **= $p < 0.001$

The Intercorrelation table provides insights into the relationships between neuropathic pain and various aspects of an individual's life, including general activity, mood, normal work, relationship, sleep, and enjoyment in life. The table is based on data from 110 individuals.

The correlation between neuropathic pain and general activity is statistically significant and negative ($r = -0.20$, $p < 0.01$), indicating that as neuropathic pain increases, general activity tends to decrease. The correlation between neuropathic pain and mood is also statistically significant and negative ($r = -0.29$, $p < 0.01$). This suggests that as neuropathic pain severity increases, an individual's mood tends to worsen. Similarly, neuropathic pain is negatively and significantly correlated with normal work ($r = 0.16$, $p > 0.05$), indicating that higher levels of neuropathic pain

are associated with decreased ability to perform normal work. However, it's important to note that this correlation is not statistically significant at the conventional $p < 0.05$ level. The correlation between neuropathic pain and relationship is statistically significant and negative ($r = -0.24, p < 0.01$), implying that as neuropathic pain increases; the quality of relationships tends to decline. Neuropathic pain is also significantly and negatively correlated with sleep ($r = -0.22, p < 0.01$), suggesting that increased neuropathic pain is associated with poorer sleep quality.

Furthermore, there is a significant negative correlation between neuropathic pain and enjoyment in life ($r = -0.21, p < 0.01$), indicating that higher levels of neuropathic pain are linked to decreased levels of enjoyment in life. In summary, all the examined aspects of an individual's life (general activity, mood, normal work, relationship, sleep, and enjoyment in life) are negatively correlated with neuropathic pain, except for the correlation between normal work and neuropathic pain, which is not statistically significant. These findings suggest that neuropathic pain is associated with a reduced quality of life across multiple domains.

5.5. Wellbeing Among Different Socioeconomic Classes

Table 6 The one way ANOVA assesses whether there are statistically significant differences in well-being among different socioeconomic classes (lower, middle, and upper) (N=110).

ANOVA					
Wellbeing	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	650.183	2	325.092	5.770	.004
Within Groups	6028.081	107	56.337		

Multiple Comparisons

Wellbeing	(I) socioeconomic	(J) Socioeconomic Classes	Mean Difference (I-J)	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Bonferroni	Lower Class	Middle Class	-8.17100*	.003	-14.0246	-2.3174
		Upper class	-6.97576	.063	-14.2225	.2710
	Middle Class	Lower Class	8.17100*	.003	2.3174	14.0246
		Upper class	1.19524	1.000	-3.9219	6.3124
	Upper class	Lower Class	6.97576	.063	-.2710	14.2225
		Middle Class	-1.19524	1.000	-6.3124	3.9219

Note: *. The mean difference is significant at the 0.05 level.

The F-statistic (5.770) is a measure of the ratio of variability between groups (socioeconomic classes) to variability within groups. The p-value (Sig.) associated with the F-statistic is 0.004. This p-value is less than the typical significance level of 0.05 ($\alpha = 0.05$), indicating that there is statistical evidence to reject the null hypothesis. In other words, there are significant differences in well-being scores among the different socioeconomic classes.

The post-hoc multiple comparisons using the Bonferroni method there is a significant difference in well-being scores between the lower and middle socioeconomic classes, with the middle class having higher well-being on average. There is no statistically significant difference in well-being scores between the lower and upper socioeconomic classes, but there is a marginally significant difference ($p = 0.063$). There is no statistically significant difference in well-being scores between the middle and upper socioeconomic classes. These results indicate that socioeconomic class has a significant impact on well-being, with the middle class showing higher well-being scores compared to the lower class.

5.6. Gender Difference Between Neuropathic Pain and Wellbeing Among Male And Female

Table 7 *The independent sample t test to assess the gender difference between wellbeing and neuropathic pain (N=110).*

Variables	Male		Female		P	t(108)	95%CL	
	M	SD	M	SD			UL	LL
Wellbeing	21.0	8.4	19.7	7.4	.14	.87	4.3	-1.7
Neuropathic pain	5.9	2.0	5.8	1.9	.73	.26	.87	-.66

The table presents data on wellbeing and neuropathic pain levels among male and female participants. In terms of wellbeing, male participants (N=43) have a mean score of 21.0930 (SD=8.43127), while female participants (N=67) have a slightly lower mean of 19.7612 (SD=7.43271). For neuropathic pain, male participants (N=43) report a mean score of 5.9535 (SD=2.01132), whereas female participants (N=67) have a mean score of 5.8507 (SD=1.96371). The independent samples tests conducted to compare gender groups reveal that there are no significant differences in wellbeing or neuropathic pain levels, whether assuming equal variances or not. In both cases, p-values are greater than 0.05, indicating that gender does not appear to have a significant impact on wellbeing or neuropathic pain levels in this study.

6. DISCUSSION

The present study aimed to investigate the effect of neuropathic pain on the psychological well-being of individuals. The data analyzed from various primary research articles, systematic reviews, and a case study to explore the relationship between neuropathic pain and psychological well-being. The findings provide important insights into the negative impact of neuropathic pain on various aspects of psychological well-being. The findings align with existing literature and will discuss each result in the context of relevant research.

The analysis revealed a strong negative correlation between neuropathic pain and psychological well-being ($r = -0.87$). This finding is consistent with numerous studies, including the research by Jensen and Turk (2018), which emphasized that individuals with neuropathic pain are more likely to experience psychological distress, such as depression and anxiety. This negative relationship between neuropathic pain and psychological well-being has been widely documented in both clinical and research settings (Lu et al., 2020). The statistically significant p-value ($p = 0.02$) further supports the robustness of this correlation. This is in line with previous research that has consistently demonstrated the adverse effects of neuropathic pain on psychological well-being (Smith et al., 2017).

Linear regression analysis reinforced the predictive relationship between neuropathic pain and psychological well-being. This result is consistent with the research conducted by Smith et al. (2017), who found that the severity of neuropathic pain was associated with worsening psychological well-being over time. Our findings suggest that for every 1-unit increase in neuropathic pain, there is a corresponding decrease of 0.87 units in psychological well-being. This aligns with the established understanding that neuropathic pain significantly impacts an individual's psychological state (Tang et al., 2020).

The analysis extended beyond the overall relationship between neuropathic pain and psychological well-being to investigate specific life domains affected by neuropathic pain. These findings resonate with prior research. The results indicate that as neuropathic pain severity increases, general activity tends to decrease. This aligns with the findings of Smith et al. (2018), who reported that individuals with neuropathic pain are often limited in their daily activities. The significant negative correlation between neuropathic pain and mood underscores the psychological toll of neuropathic pain, as supported by research by Sullivan et al. (1995) that links neuropathic pain to mood disturbances. Although the correlation between neuropathic pain and normal work was not statistically significant at

the conventional level, the negative trend observed aligns with previous studies, such as Schulz et al. (2004), which highlighted the challenges individuals with neuropathic pain face in maintaining their work capacity. The negative correlation between neuropathic pain and relationship quality corresponds to the findings of Sullivan et al. (1995) and Smith et al. (2018), emphasizing the strain neuropathic pain can place on interpersonal relationships. The association between neuropathic pain and poorer sleep quality is consistent with research by Jensen and Turk (2018), who noted that sleep disturbances are a common co-occurrence in individuals with neuropathic pain. The negative correlation between neuropathic pain and enjoyment in life echoes the findings of Pavot and Diener (1993), suggesting that neuropathic pain diminishes the overall quality of life.

The study also explored the influence of socioeconomic class on well-being, which has been less extensively studied in the context of neuropathic pain. Our results are consistent with previous research indicating that socioeconomic class plays a role in well-being. The middle class, as found in this study, tends to report higher well-being scores compared to the lower class. Although not statistically significant, the marginally significant difference between the lower and upper socioeconomic classes underscores the potential impact of socioeconomic factors on well-being (Smith et al., 2018).

In examining gender differences, study found no significant disparities in well-being or neuropathic pain levels between males and females. This aligns with previous research, including the work of Smith et al. (2017), which did not identify gender as a significant factor in determining well-being or neuropathic pain levels in individuals with neuropathic pain.

CONCLUSION

In conclusion, this study has provided valuable insights into the relationship between neuropathic pain and psychological well-being in individuals. The findings support the hypothesis that neuropathic pain is significantly associated with decreased psychological well-being. The analysis revealed a strong negative correlation between the severity of neuropathic pain and psychological well-being, indicating that as pain severity increases, psychological well-being tends to decrease. This relationship was further confirmed through linear regression analysis, which showed that neuropathic pain can predict changes in psychological well-being, explaining approximately 31% of the variance.

Additionally, the study explored how neuropathic pain impacts various aspects of an individual's life, including general activity, mood, normal work, relationships, sleep, and enjoyment in life. The results consistently showed negative correlations between neuropathic pain and these life domains, highlighting the wide-ranging adverse effects of neuropathic pain on an individual's overall well-being.

Furthermore, the study examined the influence of socioeconomic class on well-being and found that the middle class tends to report higher well-being scores compared to the lower class. This suggests that socioeconomic factors can play a significant role in shaping an individual's well-being in the context of neuropathic pain.

Regarding gender differences, the study did not find significant disparities in well-being or neuropathic pain levels between males and females. This aligns with previous research indicating that gender may not be a significant factor in determining well-being or pain levels in individuals with neuropathic pain.

Limitations

While this study provides valuable insights, it is not without limitations. First, the cross-sectional design of the study limits the ability to establish causality. Longitudinal studies would be more suitable for examining the temporal relationships between neuropathic pain and changes in psychological well-being over time. Second, the study relied on self-report measures, including the DN4 questionnaire and the Satisfaction with Life Scale. Self-report measures are subject to response bias, and individuals may underreport or overreport their pain or well-being levels. Third, the study was conducted at a single medical facility, which may limit the generalizability of the findings to a broader population. A more diverse sample from multiple locations would enhance the external validity of the results. Lastly,

while the study examined the impact of socioeconomic class on well-being, it did not explore other potential confounding variables, such as access to healthcare or social support, which could also influence well-being outcomes.

Future Recommendations

To address the limitations and further advance our understanding of the relationship between neuropathic pain and psychological well-being, future research could consider the following recommendations. Conduct longitudinal studies to track changes in neuropathic pain and psychological well-being over time, allowing for the exploration of causal relationships. Incorporate objective measures of pain severity and psychological well-being, such as physiological markers and neuropsychological assessments, in addition to self-report measures, to provide a more comprehensive understanding. Expand the participant pool to include a more diverse range of individuals from various geographic locations, ethnicities, and socioeconomic backgrounds to enhance the generalizability of findings. Investigate the influence of other potential confounding variables, such as social support, access to healthcare, and coping strategies, on the relationship between neuropathic pain and well-being. Explore the effectiveness of interventions, such as cognitive-behavioral therapy, mindfulness-based approaches, and pain management strategies, in improving psychological well-being in individuals with neuropathic pain. Conduct qualitative research to gain a deeper understanding of the lived experiences of individuals with neuropathic pain, shedding light on the subjective aspects of pain and well-being. Investigate gender and cultural factors that may influence the experience of neuropathic pain and its impact on well-being, considering potential cultural differences in pain expression and coping. Advocate for public health initiatives that address the psychosocial aspects of neuropathic pain, including raising awareness, reducing stigma, and improving access to pain management and mental health services.

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