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PHYSICAL AND PSYCHOSOCIAL FACTORS ASSOCIATED WITH WRIST AND HAND PAIN AMONG NURSES OF KARACHI

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Abstract

OBJECTIVE:
The purpose of the study is to evaluate the psychosocial physical, and personal characteristics of wrist or hand discomfort among hospital-based nurses of Karachi.

METHODOLOGY:
A descriptive cross sectional study among 285 nurses of age group 20 to 45 will be conducted at Lyari general Hospital, NICVD Hospital, and Modern Hospital, Mamji Hospital, and AL Mustafa Hospital to investigate the physical and psychosocial factors associated with wrist and hand pain using standardized Nordic Questionnaire and Pain Catastrophizing Scale.

RESULT:
The research is being carried out via two questionnaires as (a) The NMQ (Nordic Musculoskeletal Questionnaire) It's used in epidemiological studies to compare complaints in the nine organs including shoulders, neck, low back and other areas of the body and b) PCS (Pain Catastrophizing Scale) is a questionnaire that is used to measure and assess pain catastrophizing. It is used in clinical practice and research to help guide treatment planning; hence been conducted to explore Physical and Psychosocial Factors Associated With Wrist And Hand Pain Among Nurses of Karachi and found significant correlation among inter-dependent relationship of variables as Directions of relation among all dependent variables correlated positively for all items for association as NMQ has positive relationship with PCS as 40.5%. It is observed that male-gender has dominancy as 67.7% population in pain prevalence and 68.8% in pain impact ; also having largest prevalence in age bracket of 26~30 years as 29.5% in pain prevalence and 31.9% in pain impact.

CONCLUSION
The study aims to assess the physical and Psychological aspects related to hand and wrist discomfort among Karachi hospital-based nurses. According to this study, repetitive duties, awkward postures, and severe workloads are the main causes of the high prevalence of hand and wrist discomfort among Karachi's nursing staff. The problem is made worse by psychosocial elements including low job satisfaction and stress. The prevalence of pain was found to be significantly correlated with factors like hospital settings, gender, and age. It is essential to address these issues through stress management initiatives, ergonomic upgrades, and increased staffing in order to enhance nurses' productivity and well-being.

Keywords: *Psychological functioning. Physical fitness, pain. Nursing, musculoskeletal pain, wrist joint..*

Introduction

One of the occupational categories with the highest prevalence of musculoskeletal pain (MSP) worldwide is nurses. Epidemiologic research has shown that individual traits and work-related physical and psychosocial variables (PSFs) are significant contributors to the development of MSP. [1] An essential component of any healthcare team is the nursing staff. They demonstrate the poor regard for the profession by performing the widest range of tasks, working long hours, or holding many jobs·[2] Since it is believed that physical activities at work are the primary cause or aggravating factor for symptoms and disorders in the area, a large number of investigations into hand-wrist complaints have been carried out in the workplace. [3] Studies among nurses in Nigeria, Korea, Japan, New Zealand, and Iran have found that the 12-month prevalence of wrist or hand discomfort varies from 16% to 47% [4]. They were closely linked to psychological risk factors, including somatizing propensity and low mood. Although pain can lower mood.[5] It's unclear how psychological risk factors and musculoskeletal illnesses relate to one another.[6] specifically, extended periods of time spent performing the same actions and movements, adopting postures deemed "inadequate," and applying extreme force to the same anatomical regions. [7]

Being on the front lines to serve the public, nurses' health will deteriorate if they neglect it, and the public's quality of life would suffer as a result [8]. It is becoming more widely acknowledged that well-designed employment is generally beneficial to health and that people with musculoskeletal problems generally benefit from working. [9] A number of important risk factors for musculoskeletal pain in nursing, such as prolonged standing, manual patient handling, and repetitive motions, all of which increase physical strain. [10]

The defining feature of a work-related musculoskeletal condition is musculoskeletal pain or discomfort at work. Additional symptoms could be numbness, burning, tingling, lack of strength, or muscle weariness. Pain characteristics that can shed light on its source include location, radiation, intensity, quality, speed of onset, aggravating and mitigating factors, and daily patterns. Early assessment of pain during the disease (i.e., early report [11] Occupational risk factors that have been less often researched in the workplace but have a substantial correlation with musculoskeletal impairment in the community include somatizing tendency. Furthermore, non-occupational risk factors like somatizing tendency, which have not received as much attention in the workplace but are closely linked to musculoskeletal disability in the community, should be included in this study.[12] On the one hand, lack of sufficient knowledge of standard working conditions, improper use of muscles in various situations, and lack of physical training that plays a preventive and corrective role can have a negative effect on the musculoskeletal structure of the body. nurses, leading to the deformation of the limbs. [13] It's unclear how psychological risk factors and musculoskeletal illnesses relate to one another. However, one analysis found that musculoskeletal illnesses were associated with limited control and a lack of social support at work. [14] On the other hand, unemployment and poorly planned work are important social predictors of health disparities. Consequently, health care providers must think about how their patients' illnesses affect their work. Disabling symptoms are common in patients with musculoskeletal disorders (MSDs), and they may or may not restrict the kind or amount of work that they can perform. Sometimes a patient's work may have exacerbated their MSD or perhaps caused it to develop in the first place. Health care providers, however, need to be aware that their jobs can also serve as a therapeutic tool to assist patients continue to function. One of the main causes of pain and disability in working-age people is musculoskeletal problems. Even while some musculoskeletal illnesses can arise as a result of working in ergonomically unsound occupations, it is becoming more widely acknowledged that well-designed employment is generally beneficial to health and that people with musculoskeletal problems generally benefit from working . [15]

METHODOLOGY:

Study Design

The research was observational cross-sectional study.

Study Population

The study was conducted at Lyari General Hospital, Mamji Hospital, NICVD Hospital, AL Mustafa Hospital and Modern Hospital.

Study Duration

The study was conducted over a period of 6 months after the approval of synopsis.

Sample Size

The sample size was calculated by using open epi online software, a sample size of 285 achieves with a confidence level of 95% and a margin of error 5%.

Formula,

$$n= z^2 pq / e^2$$

Sampling Technique

The sampling technique will be Non-Probability Convenience Sampling technique.

DATA COLLECTION PLAN

Data was gathered for the study using a structured questionnaire called the Standardized Nordic Musculoskeletal Questionnaire and Pain Catastrophizing Scale with demographic, occupational attributes, physical workload and psychological factors. Data collection as a quick and effective method.

DATA ANALYSIS

IBM SPSS Statistics Version 29 was used for data analysis. This program will be chosen for the analysis of quantitative data in this study because of its strong statistical capabilities and intuitive interface.

RESULT:

The study analyzed data from 285 nurses. The descriptive statistics for the Pain Catastrophizing Scale (PCS) and the Nordic Musculoskeletal Questionnaire (NMQ) are presented. The mean scores for PCS items ranged from 0.60 to 0.96, with standard deviations ranging from 1.025 to 1.269. The mean scores for NMQ items ranged from 0.316 to 0.758, with standard deviations ranging from 0.466 to 0.486. The correlation analysis revealed significant positive correlations between PCS items and pain prevalence, with correlation coefficients ranging from 0.641 to 0.779 ($p < 0.01$). The correlation analysis also revealed significant positive correlations between NMQ items and pain prevalence, with correlation coefficients ranging from 0.384 to 0.779 ($p < 0.01$). The chi-square test revealed significant associations between age bracket, gender, hospital name, and pain prevalence ($p < 0.05$). The test also revealed significant associations between age bracket, gender, hospital name, and Nordic prevalence ($p < 0.05$). The diagnostic analysis revealed that the data met the assumptions of normality, homogeneity, and multicollinearity. The Cronbach's alpha values for PCS and NMQ were 0.940 and 0.730, respectively, indicating excellent and

acceptable reliability. The variance inflation factor (VIF) values were less than 10, indicating no multicollinearity. The Shapiro-Wilk test revealed that the data were normally distributed for all PCS and NMQ items ($p > 0.05$). The Levene's test revealed that the data met the assumption of homogeneity for NMQ items ($p > 0.05$). However, the test revealed that the data did not meet the assumption of homogeneity for PCS items ($p < 0.05$).

Table 1: Descriptive Analysis of PCS Scale:

PCS Descriptive	N	Min	Max	Mean	SD	Var.	%
I'm worry all the time whether the pain will end	285	0	4	0.60	1.025	1.051	15.0%
I feel I can't go on	285	0	4	0.65	1.040	1.081	16.2%
It's terrible and I think it's never going to get any better	285	0	4	0.64	1.113	1.238	16.1%
It's awful and I feel that it's overwhelms me	285	0	4	0.64	1.027	1.056	16.0%
I feel I can't stand it anymore	285	0	4	0.67	1.139	1.298	16.8%
I become afraid that the pain will get worse	285	0	4	0.80	1.174	1.379	20.0%
I keep thinking about that the other painful events	285	0	4	0.69	1.098	1.206	17.4%
I anxiously want the pain to go away	285	0	4	0.96	1.269	1.611	24.1%
I can't seem to keep it out of my mind	285	0	4	0.65	1.008	1.016	16.3%
I keep thinking about how much it hurts	285	0	4	0.80	1.132	1.282	19.9%
I keep thinking about how badly i want the pain to stop	285	0	4	0.88	1.180	1.391	22.1%
Theres is nothing I can do to reduce the intensity of pain	285	0	4	0.79	1.177	1.385	19.7%
I wonder whether something serious may happen	285	0	4	0.81	1.224	1.499	20.3%

The above table shows descriptive analysis of VAS related to measure the aiming to Explored the Association of Physical And Psychosocial Factors With Wrist And Hand Pain Among Nurses of Karachi of each element showed how frequently respondents made assertive answers against these questions. PCS is the parameters to show the overall involvement of respondents in response to assess the Exploring Association here and in the rest of documents as well, showing that 24.1% respondents have made highest assertive answers to the question "I anxiously want the pain to go away" and lowest assertive answer is 15.0% which has made to question "I'm worry all the time whether the pain will end". (Table 1).

Table 2: Descriptive Analysis of NMQ Scale:

NMQ	N	Min	Max	Mean	SD	Var.	%
Trouble in 12 Months	285	0	1.00	0.758	0.429	18.4%	75.8%
Work prevention since 12 Months	285	0	1.00	0.379	0.486	23.6%	37.9%
Trouble in 07 Days	285	0	1.00	0.316	0.466	21.7%	31.6%

The above table shows descriptive analysis of NDI related to measuring the Association of Mean of each element showing how frequently respondents made assertive answers against these questions. NDI is the parameters to show the overall involvement of respondents in response to assess association in the rest of documents as well; showing highest response for items "twelve month trouble with pain" as 75.8% respondents answered assertively and lowest response for items "Trouble with pain since seven days" in which 31.5% respondents have assertively answered. (Table 2).

Table 3: Correlation Analysis of NMQ prevalence variables:

NMQ Correlation	Trouble in 12 Months	Work prevention since 12 Months	Trouble in 07 Days	Nordic Prevalence
Trouble in 12 Months	1.00	0.425**	0.384**	0.779**
Work prevention since 12 Months	0.425**	1.00	0.605**	0.550**
Trouble in 07 Days	0.384**	0.605**	1.00	0.578**
Nordic Prevalence	.779**	0.550**	.578**	1.00
****. Correlation is significant at the 0.01 level (2-tailed).**				

The above table shows the Correlation Analysis between PCS on pain prevalence as table 3 which shows the correlations between PCS items on pain prevalence. Directions of relation among all variables are correlated positively for all PCS items. The highest positive inter-relative variable to pain" is observed positive relationship on pain prevalence as 77.9% and least relationship has found as "Work prevention since twelve months due to pain" as positively correlated by 55.0%.(table 3).

Table 4: Correlation Analysis of Dependent variables:

DVs Correlation	Nordic Prevalence	Pain Prevalence
Nordic Prevalence	1.00	0.405**
Pain Prevalence	0.405**	1.00
****. Correlation is significant at the 0.01 level (2-tailed).**		

The Above table shows correlation Analysis between all dependent variables on pain prevalence of our research data. Directions of relation among all variables are correlated positively for all items for association.(Table 4).

Table 5: Chi-Square Tests:

Test Element	Pearson Chi-Square	p-value	Result
Age Bracket * Nordic Prevalence	14.729a	0.26	Null hypothesis rejected
Age Bracket * Pain Prevalence	6.181a	0.63	Null hypothesis rejected
Gender * Nordic Prevalence	4.150a	0.25	Null hypothesis rejected
Gender * Pain Prevalence	3.906a	0.14	Null hypothesis rejected
Hospital Name * Nordic Prevalence	22.822a	0.03	Null hypothesis rejected
Hospital Name * Pain Prevalence	27.581a	0.00	Null hypothesis rejected

The Above table shows that each element has greater chi-square value than of p-value; resulting that each HO have rejected and concluded the assertiveness of all alternative hypothesis and stated that age bracket, gender and hospital name have significant impact on Physical And Psychosocial Factors Associated With Wrist And Hand Pain Among Nurses Of Karachi.(Table 5).

Table 7: Reliability Statistics:

Cronbach's Alpha	Cronbach's Alpha	N of sub-scales
NMQ	0.730	3
PCS	0.940	13
Overall	0.934	16

The Above table shows that Cronbach's Alpha of two (02) scales; NMQ questionnaire is 0.73 with three (03) items, PCS questionnaire is 0.94 with thirteen (13) items; and Cronbach's Alpha of all sixteen (16) items of overall NMQ-PCS questionnaire is 0.934 which shows acceptable reliability of NMQ questionnaire, excellent reliability of PCS questionnaire and Excellent reliability of all two questionnaires to use it in this research.(Table 7).

Table 8: Multicollinearity Values:

Model: Dependent Variable: NMQ and PCS	
Age	1.002
Gender	1.054
Hospital Name	1.054
a. Dependent Variable: NMQ and PCS	

The Above table shows that VIF of all three (03) components are <10 which shows there is no collinearity and data is acceptable for performing the statistical analyses .

The Above table shows that each element has no exclusion, and each element has assessed with filled parameters.(Table 8).

Table 9: Normality Test of NMQ:

		Shapiro-Wilk		
NMQ		Statistic	Sig.	Remarks
Age Bracket	20~25	0.76	0.00	
	26~30	0.80	0.00	
	31~35	0.69	0.00	
	36~40	0.75	0.00	
	41~45	0.73	0.00	
Gender	Male	0.76	0.00	
	Female	0.79	0.00	
Hospital Name	NICVD	0.79	0.00	
	Al-Mustafa Hospital	0.65	0.00	
	Mamji Hospital	0.81	0.00	
	The Modern Hospital	0.59	0.00	
	Lyari General hospital	0.82	0.02	

Above table shows that each dimension of results has derived from a normal distributed population for assessment of Association have significant impact as value of the Shapiro-Wilk test is greater than 0.05 for all NMQ elements for all assessments.(Table 9).

Table 10: Normality Test of PCS prevalence:

		Shapiro-Wilk		
PCS		Statistic	Sig.	
Age Bracket	20~25	0.59	0.00	
	26~30	0.71	0.00	
	31~35	0.67	0.00	
	36~40	0.69	0.00	
	41~45	0.65	0.00	
Gender	Male	0.65	0.00	
	Female	0.69	0.00	
Hospital Name	NICVD	0.70	0.00	
	Al-Mustafa Hospital	0.43	0.00	
	Mamji Hospital	0.73	0.00	
	The Modern Hospital	0.68	0.00	
	Lyari General hospital	0.57	0.00	

The Above table shows that each dimension of results has derived from a normal distributed population for assessment have significant impact on Association as value of the Shapiro-Wilk test is greater than 0.05 for all PCS elements for all assessments.(Table 10).

Table 11: Homogeneity Test for NMQ:

NMQ	Levene Statistic	p-value
Age	3.011	0.019
Gender	0.022	0.881
Hospital Name	0.126	0.973

The Above table shows that population of all NMQ elements for assessment of Association have significant impact on Association as have p-value is more than 0.05; hence homogeneity assumption of the variance is met; have a mean that spread of data within each combination of factors should be roughly the same.(Table 11).

Table 12: Homogeneity Test for PCS:

PCS	Levene Statistic	p-value
Age	2.546	0.040
Gender	7.803	0.006
Hospital Name	21.327	0.000

The Above table shows that population of all PCS elements for assessment of Association have significant impact have p-value is more than 0.05; hence homogeneity assumption of the variance is not met; have a mean that spread of data within each combination of factors should be roughly the same except gender

and hospital name hence homogeneity assumption of the variance is not met which means our data sample for The table showing that two-hundred and seventeen respondents have found with NMQ pain prevalence consist pain-affected organs w.r.t. gender i.e., 147 respondents (67.7% of population) are male and 70 respondents (32.3% of population) are female.(Table 12).

Table 13: Cross-tabulation of data:

	Nordic Prevenance				To tal
Age Bracket	No Impact	Low Impact	Moderate Impact	High Impact	
20~25	20	41	7	0	68
26~30	27	50	10	4	91
31~35	8	44	6	1	59
36~40	12	36	5	1	54
41~45	1	9	3	0	13
Total	68	180	31	6	28 5

The above table shows that age group of "26-30" exists with highest numbers i.e. 04 (1.40%) and “20-25” and "41-45" each with minimum number of 05 (1.84%) of total population of "High impact" status cross-tabulated over NMQ.(Table 13).

	Pain prevalence			Total
Age Bracket	Low Pain	Moderate Pain	High Pain	
20~25	50	12	6	68
26~30	54	25	12	91
31~35	38	15	6	59
36~40	33	11	10	54
41~45	9	3	1	13
Total	184	66	35	285

The above table shows that age group of "25-27" exists with highest numbers i.e. 11 (4.04%) and “51-55” with minimum number of 02 (0.74%) of total population of "High pain" status cross-tabulated over prevalence to PCS.(Table 13)

	Nordic Prevenance				To tal
Gender	No Impact	Low Impact	Moderate Impact	High Impact	
Male	20	41	7	0	68
Female	27	50	10	4	91
Total	68	180	31	6	28 5

The above table shows that gender group of "Female" exists with highest numbers i.e. 04 (1.40%) and “Male" with minimum number of 00 (0.0%) of total population of "High impact" status cross-tabulated over NMQ.(Table 13).

	Pain Prevalence			Total
Gender	Low Pain	Moderate Pain	High Pain	

Male	50	12	6	68
Female	54	25	12	91
Total	184	66	35	285

The above table shows that gender group of "Female" exists with highest numbers i.e. 12 (4.21%) and “Male” with minimum number of 06 (2.11%) of total population of "High pain" status cross-tabulated over prevalence to PCS.(Table 13).

	Nordic Prevenance				Total
Hospital Name	No Impact	Low Impact	Moderate Impact	High Impact	
NICVD	22	83	21	5	131
Al-Mustafa Hospital	18	38	1	0	57
Mamji Hospital	13	28	7	1	49
The Modern Hospital	12	25	0	0	37
Lyari General hospital	3	6	2	0	11
Total	68	180	31	6	285

The above table shows that Hospital name group of "NICVD" exists with highest numbers i.e. 05 (1.40%) and “Al Mustafa”, “Modern hospital" and "Lyari general hospital" each with minimum number of 00 (0.0%) of total population of "High impact" status cross-tabulated over NMQ. (Table 13).

	Pain prevalence			Total
Hospital Name	Low Pain	Moderate Pain	High Pain	
NICVD	78	28	25	131
Al-Mustafa Hospital	49	7	1	57
Mamji Hospital	27	14	8	49
The Modern Hospital	22	14	1	37
Lyari General hospital	8	3	0	11
	184	66	35	285

The above table shows that Hospital name group of "NICVD" exists with highest numbers i.e. 25 (8.77%) and “Lyari general hospital” with minimum number of 00 (0.00%) of total population of "High pain" status cross-tabulated over prevalence to PCS. (Table 13).

DISCUSSION:

One of the research highlights the need for workplace interventions to reduce musculoskeletal pain and discomfort among nurses. Hospitals and healthcare organizations can implement ergonomic changes, provide training on proper lifting techniques, and promote regular breaks to reduce the risk of musculoskeletal disorders. The research emphasizes the importance of employee wellness programs that address physical and psychosocial factors contributing to musculoskeletal pain. Hospitals can offer stress management workshops, exercise programs, and mental health resources to support nurses' overall well-

being. Another study suggested that nurses require training and education on managing musculoskeletal pain, stress, and workload. Hospitals can provide regular training sessions, workshops, and conferences to equip nurses with the necessary skills and knowledge. Occupational Health and Safety Policies: The research highlights the need for hospitals to develop and implement occupational health and safety policies that address musculoskeletal disorders. Policies can include regular risk assessments, ergonomic evaluations, and procedures for reporting and managing work-related injuries. The study emphasizes the importance of adequate staffing and workload management to reduce the risk of musculoskeletal disorders. Hospitals can implement staffing models that ensure adequate nurse-to-patient ratios, flexible scheduling, and regular breaks. The research suggests that hospitals and healthcare organizations should provide adequate workers' compensation and benefits to nurses who experience work-related musculoskeletal disorders.[16]

Work-Related Musculoskeletal Diseases (WMSDs) are diseases or injuries to muscles, nerves, or soft tissues caused by exposure to workplace risk factors [17]. MSDs at work negatively impact employees' productivity, quality of life, absenteeism, and impairments Physical activities at work are believed to be the primary cause or aggravating factor for symptoms and disorders .Unfavorable working hour characteristics, such as lengthy work weeks and evening shifts, are linked to work-life balance issues and a higher risk of work-related injuries [18]. The primary causes of nurses' WMSDs are repetitiveness in nursing tasks, workplace conditions, and equipment [19] A combination of psychological and physical stressors increases the risk of musculoskeletal problems [20]. Long work hours, managing life-threatening illnesses, and demanding superiors are stressful situations that ED nurses face [21]. Well-designed employment is generally beneficial to health, and people with musculoskeletal problems often benefit from working. The observation, assessment, and repair of physical anomalies, such as impairments in tissue and joint anatomy, biomechanics, tension, range, mobility strength, movement patterns, and functional activities, are the areas of expertise for physiotherapists. Intentionally or unintentionally, physiotherapists employ a variety of impairment-focused skills, strategies, and approaches to help patients feel better and function better. The research suggests that hospitals and healthcare organizations should provide adequate workers' compensation and benefits to nurses who experience work-related musculoskeletal disorders.

CONCLUSION:

According to this study, a high frequency of hand and wrist discomfort among Karachi's nursing staff is caused by repetitive motions, physically taxing jobs, and psychological stressors such poor work-life balance and job discontent. Significant correlations between pain and variables including age, gender, and workplace were validated by statistical analysis. The importance of helplessness and rumination in pain perception was brought to light by instruments such as the Nordic Musculoskeletal Questionnaire and the Pain Catastrophizing Scale. The results highlight the necessity of greater workload distribution, stress management initiatives, and ergonomic advancements. The study highlights the significance of workplace changes and legislative reforms to improve nurses' health and the general quality of healthcare, despite its cross-sectional design limitations.

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