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Original Article

The Impact of Psychosocial factors on Quality of life among the Caregivers of Person's with Dementia

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Abstract

Objective: To assess caregiver burden, social support, and quality of life among caregivers of people with dementia, as well as the link between caregiver burden and quality of life.

Place and duration of study: The study was conducted in various health care units of Rawalpindi and Islamabad for 6 months from September 2020 to Febraury 2021.

Material and Methods: There were (N=50) informal caregivers among the participants. The study included participation from both men (n = 18, 36%) and women (n = 32, 64%). Purposive sampling was used to gather data from hospitals' departments of neurology and psychiatry. The research design used for the study was a correlational survey. The Statistical Package for the Social Sciences (SPSS) was used to examine the study's findings. The association between quality of life and psychosocial factors was evaluated using bivariate Pearson's correlation analysis. To determine if psychosocial factors are predictive of quality of life, hierarchical multiple regression was utilized.

Results: The results of the study showed a strong positive correlation between social support and quality of life. Additionally, it was found that caregiver burden and quality of life were significantly correlated negatively. The results of the hierarchical multiple regression analysis showed that while caregiver burden had a negative effect on quality of life, social support positively predicted quality of life.

Conclusion: The quality of life of caregivers is a crucial topic in the current era, particularly in a nation like Pakistan where caregivers tend to their elderly family members for the majority of the time. The negative experience of caregivers can influence the individuals with dementia continuity of care, compliance with treatment and social support. Then, it becomes a vicious cycle

Keywords: *:* Informal Caregivers, Persons with Dementia, Quality of Life, Caregiver Burden, Social Support.

1. Introduction

"Caregiving typically entails substantial expenditures of time, energy, and money over potentially extended periods. It entails tasks that may be unpleasant and inconvenient, as well as psychologically stressful and physically exhausting".[(1)] Family caregivers are deemed as the foundation of healthcare unit in Pakistani society. Caregivers perform daily tasks including household chores, family finances, drug administration, and medical care. As a result, caregivers report poor physical health compared to non-caregivers. People who look after people with dementia can be classified as formal and informal caregivers. Formal caregivers are defined as health care professionals such as nurses, social workers, rehabilitation professionals and doctors who receive financial compensation for their care. [(2)] When care can no longer take place at home, then systematic formal caregivers begin to function more fully. This could be a living together, assisted living, a persistent retirement care Centre or a nursing home. Care for extended period of time significantly impacts the finances of a caregiver, as well as a healthy partner living at home. [(3)] Increasingly, systematic caregivers and their families lack social support and are unable to cope with work pressures and other emotional problems. [(4)] Informal caregivers are untrained

Individuals who provide residential care for another

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person like family member or a friend. They also provide care or people with any other physical , psychological problems. [5] In order to cater the basic necessities of individuals with dementia, these caregivers play an essential part in providing assistance, attention and support they require. [6] Informal caregivers frequently lack the technical expertise and inadequate training required to address the requirements of individuals with dementia, who are likely to experience an immense burden of care and symptoms of depression.[7]

The primary caregiver (PC) is an individual who is expected to provide the dementia patient with support, sense of belongingness and everyday care; the person in the patient`s company most often. Usually, the primary caregiver is a spouse, woman, older child or daughter-in-law connected with the patient in need of treatment. [8] The secondary or supporting caregiver (SC) is an individual who assists or replaces the primary caregiver whenever required; thus, looking after the person with dementia. There may be a relative, friend or neighbor of the secondary caregiver.[9] Older people are regarded with honor, dignity and esteem in our society in the context of traditional family and cultural norms. It is expected that assistance, caring and compassion for the elderly would come from family members.[10] For long periods, ranging from months to years, they are bound to provide psychological, physical, emotional and social benefits to the patients of dementia. Such a huge responsibility would in turn impact the wellbeing of these caregivers. [11] Studies have identified that caregivers with greater caregiving burdens have poorer quality of life. [12]

Dementia harms not only the individual but also the caregivers. However, Dementia is more than an occasional memory loss. Dementia is the most common disorder triggered by impairment in memory due to malfunctioning of numerous brain cells. It also damages thought pattern, actions and individuals' capacity to manage day-to-day activities. It is considered as chronic and progressive disease. [13]

According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), dementia is a general term for a number of neurological conditions. The predominating sign of such problems was the loss of brain control because of changes in brain's physiology. That's why it is considered discrete and was distinguished from all other psychological disorders (American Psychiatric Association. [14] Dementia is labelled as Neurocognitive Disorder (NCD) by the American Psychological Association (APA, 2013). This group of Neurocognitive Disorder is subdivided into major neurocognitive disorder and minor neurocognitive disorder. Dementia usually causes impairment in memory, planning, attention, language, learning, visuospatial and social skills or in other essential cognitive functions.

2. Materials & Methods

In the current study, correlational design was used to assess the relationship between quality of life, caregiver burden and social support. The impact of caregiver burden and social support on quality of life was also assessed. Data was collected purposively using quantitative tools. Sample size was calculated through *Raosoft* sample size calculator for the current study. Total 50 informal caregivers were enrolled in the study with 18 males and 32 females. The age range of the respondents was 18 to 60 years. Data was collected using purposive sampling technique from various health care units of Rawalpindi and Islamabad. Primary caregivers who have been offering care to individuals with dementia for at least 6 months have been included.

The consent form comprised of objective of the study. Initially, participants were informed regarding purpose and requirements of the research. They were also briefed about their voluntary participation and right to withdraw from study at any time. Participants were also assured about the confidentiality of their personal information and responses to the questionnaire. After taking verbal consent, written consent of the participants was needed to proceed further in the study.

The demographic sheet contained information about the participants. It includes caregivers` age, gender, socio

economic status, education, caregiver relationship with patient, number of caregivers', duration of care provided by caregiver. Socioeconomic status was measured on the basis of family monthly income of participants. The information about the persons with dementia includes age, gender, types of dementia, severity level of dementia and relevant medical and psychiatric history of the persons with dementia.

The WHOQOL Group and Orley et al. (1994) developed the scale, and Khalid and Kausar (2006) translated it into Urdu. [15,16] The quality of life of dementia caregivers was evaluated using the scale. This illustrates a subjective response by assessing the preceding two weeks. The abbreviation for WHOQOL-100 is WHOQOL-BREF. There were four subdomains and 26 items on the scale. There are 7 items related to physical health, 6 related to psychological health, 3 related to social relationships, and 8 related to the environment. A 5-point Likert-type scale was used to rate the items. The measure was self-reported. For each domain high score indicated better quality of life. There were 3 reverse coded items; item 3, item 4 and item 26 which were recoded into same variables before computed the total score. Cronbach`s alpha reliability values in the original English version of WHOQOL-BREF for each domain reliability values ranged from .66 to .84, indicating good internal consistency (World Health Organization, 1998). Moreover, alpha reliability in the Urdu translated version was reported as .78, .71, .73 for physical, psychological, environment and social relationship respectively. Social relationship had alpha reliability of .56 which showed not so good internal consistency due to the minimum number of items. [17]

The scale was designed by Zarit et al. (1980) and Urdu-translated by Butt and Bashir (2014). The original English version had 29 items and 22 item version (ZBI-22) was substituted in 1985. The subjective burden challenged by primary caregivers was assessed with it. It was a questionnaire that was self-administered or could be administered by an interviewer. There are five subscales of ZBI questions: 6 items in interpersonal burden, 7 items in mental well-being, 4 items in family and social life, 1 item in finances, and 4 items in lack of control over one's life. A 5-point Likert-type response structure is used to rate the items, with *0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Quite Frequently, 4 = Nearly Always*. Total scores on the overall scale ranged from 0 to 88, with a greater degree of burden suggested by higher scores. Reliability coefficients in the original English version for responses to the full-scale ranged from $\alpha = .88$ to $\alpha = .94$ (O'Rourke & Wenaus, 1998). Moreover, reliability coefficient in the Urdu translated version were reported as .89.

The scale was developed by Zimet et al. (1988) and Urdu-translated version by Tonsing et al. (2012). MSPSS was deigned to determine the perceived acceptability of social support from three systems: family, friend and significant other. It was a self-administered questionnaire. The consisted of 12 items and 3 subscales including family, friend and significant other. Each subscale consisted of four items. Items were scored on a 7-point Likert scale, with answer categories of *Very Strongly Disagree* = 1, *Strongly Disagree* = 2, *Mildly Disagree* = 3, *Neutral* = 4, *Mildly Agree* = 5, *Strongly Agree* = 6, and *Very Strongly Agree* = 7. Overall, ratings varied from 12 to 84. The MSPSS original English version exhibited strong internal reliability coefficients of.87,.85, and.91 for the family, friend, and significant other subscales, respectively (Zimet et al., 1988). Furthermore, alpha reliability in the Urdu translated version was revealed to be.93,.91, and.90 for family, friend, and significant other, respectively.[18] Permission was obtained from the relevant authors of scales by email. The University's Institute Review Board (IRB) provided formal and ethical permission. The researcher got an authority letter from the Department of Clinical Psychology, confirming their institutional relationship with the department. A list of targeted hospitals was developed. The concerned authorities at Benazir Bhutto Hospital in Rawalpindi and the Pakistan Institute of Medical Sciences in Islamabad were called. A signed approval for data collection was received from the Head of Department of these hospitals via an

authority letter. The researcher individually approached the subjects to collect data. Data was gathered from individual participants. The research included 50 informal caregivers (M = 18, F = 32).

Participants were informed about the nature, aim, and objectives of the study prior to data collection. The study's aims were discussed with consenting participants. It was explicitly stated that the gathered information will be kept secret and utilized strictly for research purposes. The participants were then requested to sign the written consent form in order to take part in the study. The assessment measures were divided into two parts: demographics and scales. First, a demographic sheet was presented, followed by measures to assess quality of life, caregiver burden, and social support. The researcher gave clear instructions concerning the scales. There was enough time to fill the scales. Finally, the participants were praised for their participation and cooperation. All the ethical considerations were followed in this study. Ethical approval was taken from (IRB) Institute Review Board. Ethical permission was taken from the authors of the scales before using them. Then data was collected from the participants. Participants were briefed about the objectives and implication of the study. No deception was done about the objective of the study. The confidentiality of information and anonymity of participants was respected. Then written consent was taken from the caregivers. Research population was caregivers, so empathetic relationship developed with the respondents.

3. Results

The current study investigated the influence of psychosocial variables on quality of life among informal caregivers of individuals with dementia. The WHOQOL-BREF, Zarit Burden Interview, and Multidimensional Scale of Perceived Social Support were employed. The Alpha reliability coefficient for the scales was calculated. *Descriptive analysis* was performed to determine frequency and percentages among respondents. *Bivariate Pearson's correlation analysis* and *hierarchical multiple regression* were used to estimate the quality of life of caregivers based on social support and caregiver burden. Results are given in the following tables

Table 1
Demographic Characteristics of Caregiver

Characteristics	*n*	*%*
Gender		
Men	18	36
Women	32	64
Age		
18-40	36	72
41-60	14	28
Education		
Below Matric	11	22
Matric	10	20
Intermediate	8	16
Bachelor	6	12
Graduation	12	24
Post-Graduation	3	6
Socioeconomic Status		
Lower	16	32
Middle	34	68
Caregiver Relationship with patient		
Spouse	6	12
Children	36	72
Siblings	2	4
Grandchildren	6	12
Number of Caregivers		
1	10	20
2	30	60
3	5	10
4	5	10
Duration of Care Provided		
6 months-1 year	16	32
2 years-4 years	11	22
5 years-7 years	13	26
8 years-10 years	10	20

Table 1 revealed that majority of women caregivers (*n* = 32, 64%) participated in the study as compared to men caregivers (*n* = 18, 36%). Higher number of caregivers aged 18-40 (*n* = 36, 72%) participated in the study as compared to age 41-60 (*n* = 14, 28%). Majority

caregivers were graduates (*n* = 12, 24%) while others were below matric (*n*=11, 22%), matric (*n*=10, 20%) intermediate (*n*=8, 16%) bachelor (*n*=6, 12%) and postgraduate (*n*=3, 6%). Regarding socioeconomic status, majority of them belonged to middle class (*n* = 34, 68%) as compared to lower class (*n*=16, 32%). Most caregivers were the patient`s children (*n*=36, 72%), (*n*=6, 12%) were spouse and grandchildren; and (*n*=2, 4%) were siblings. The greater number of caregivers for persons with dementia were 2 (*n*=30, 60%) compared to 1 (*n*=10, 20%), 3 and 4 (*n*=5, 10%) respectively. Mostly caregivers were provided care from the duration of 6 months-1 year (*n*=16, 32%).

Table 2

Characteristics	*n*	%
Gender		
Men	26	52
Women	24	48
Age		
50-70	25	50
71-90	22	44
91-105	3	6
Severity Level of Dementia		
Mild	9	18
Moderate	25	50
Severe	16	32
Types of Dementia		
Alzheimer`s disease	37	74
Vascular dementia	7	14
Lewy body dementia	3	6
Frontotemporal dementia	3	6
Comorbidities		
Absent	27	54
Physical Illness	23	46

Demographic Characteristics of Persons with Dementia

Table 2 shows demographic characteristics of persons with dementia. Among patients, there was a slight gender difference between men (n=26, 52%) and women (n=24, 48%). Majority of patients were 50-70 (*n*=25, 50%) while others were 71-90 years of age (*n*=22, 44%) and only few of them were 91-105 years of age (*n*=3, 6%). Greater number of patients had moderate level (*n*= 25, 50%) of dementia. Higher number of patients had Alzheimer`s disease (*n*= 37, 74%) in comparison to Vascular dementia (*n*=7, 14%), had Lewy body dementia and Frontotemporal dementia (*n*=3, 6%) respectively. Majority of the patients had no comorbidities (*n*=27, 54%) along with dementia as compared to patient with physical illness (*n*=23, 46%).

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Table 3

Descriptive Statistics and Correlations for Study Variables

Variables	*n*	*M*	*SD*	1	2	3
1. QOL	50	79.04	17.88	_		
2. MSPSS	50	42.22	16.45	.59**	_	
3. ZBI	50	42.40	15.71	-.61**	-.49**	_

Note. Quality of Life Scale = (QOL); Multidimensional Perceived Social Support = (MSPSS); Zarit Burden Interview = (ZBI). $^{**}p<.01$

Table 4 revealed that quality of life had significant positive relationship with social support (r = .59, $p<.01$). A statistically negative correlation was observed between quality of life and caregiver burden (r = -.61, p <.01). There was highly significant negative correlation was existed between social support and caregiver burden (r = -.49, p <.01)

Table 4

Hierarchical Regression Model of Physical Quality of Life

Hierarchical Regression Model of Physical Quality of Life

Variable	*B*	95% CI for *B*		*SE B*	β	R^2	ΔR^2
		LL	*UL*				
Step 1						.25	.25
Constant	25.155***	13.79	36.52	5.63			
Gender	-.940	-4.10	2.23	1.57	-.08		
Age	-3.125	-6.97	.72	1.90	-.27		
Socioeconomic status	2.247	-1.39	5.88	1.80	.20		
Education	-.224	-1.32	.87	.55	-.07		
Caregiver relationship	.568	-1.86	2.99	1.20	.08		
Duration of Care	-1.118	-2.48	.24	.67	-.24		
No. of caregivers	.108	-2.04	2.26	1.07	.02		
Step 2						.39	.14**
Constant	34.55***	22.63	46.48	5.90			
Gender	-0.39	-3.29	2.50	1.43	-.04		
Age	-4.05*	-7.59	-.50	1.75	-.35*		
Socioeconomic status	0.44	-3.06	3.94	1.73	.04		
Education	-0.36	-1.36	.64	.49	-.11		
Caregiver relationship	0.51	-1.69	2.72	1.09	.07		
Duration of Care	-0.84	-2.09	.40	.62	-.18		
No. of caregivers	0.08	-1.87	2.04	.97	.01		
Caregiver Burden	-0.14**	-.24	-.05	.04	-.43**		
Step 3						.42	.03
Constant	33.50***	21.65	45.36	5.86			
Gender	-.045	-3.31	2.40	1.41	-.04		
Age	-4.92*	-8.61	-1.23	1.83	-.42*		
Socioeconomic status	-0.03	-3.54	3.48	1.74	-.00		
Education	-0.34	-1.33	.65	.49	-.10		
Caregiver relationship	0.16	-2.06	2.39	1.10	.02		
Duration of Care	-0.74	-1.98	.50	.61	-.16		
No. of caregivers	-0.58	-2.70	1.55	1.05	-.09		
Caregiver Burden	-0.11*	-.21	-.01	.05	-.33*		
Social Support	0.08	-.03	.19	.06	.26		

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$

Table 4 showed the impact of demographic variables, caregiver burden and social support on physical quality of life in caregivers of persons with dementia. In Step 1, the R^2 value of .25 revealed that the demographic variables explained 25% variance in the physical quality of life with F (7, 42) = 1.98, p > .05. In Step 2, the R^2 value of .39 revealed that the demographic variables and caregiver burden explained 39% variance in the physical quality of life with F (8, 41) = 3.37, p < .01. The findings revealed that age (β = -.35, p < .05) and caregiver burden inversely predicted physical quality of life (β = -.43, p < .01). In Step 3, the R^2 value of .42 explained that the 42% variance in the physical quality of life was predicted by demographic variables, caregiver burden and social support with F (9, 40) = 3.32, p < .01. Age (β = -.42, p < .05) and caregiver burden (β = -.33, p < .05) negatively and significantly predicted physical quality of life. The ΔR^2 value of .14 revealed 14% chance in the variance of model 1 and model 2 with ΔF (1, 41) = 10.04, p < .01. The ΔR^2 value of .03 revealed 3% chance in the variance of model 2 and model 3 with ΔF (1, 40) = 2.18, p > .05.

4. Discussion

The purpose of current study was to identify the impact of psychosocial factors on quality of life among the caregivers of persons with dementia.

Descriptive analysis for the caregivers (See Table 1) showed that females were higher than males in the sample population. Gender differences showed that more women than men provide the care to the persons with dementia. Results of this finding covary with the previous researches as it seems to indicate that the detrimental aspects of caregiving cause women to suffer more . Usually women have assumed the role of caregivers and women provide more family care than men.[21] Female caregivers tend to experience more distress in general and use more community resources than males. In addition, it has been proposed that women are more likely to be subjected to caregiving stressors and also experience and cope differently than men with these stressors. [19]

The age range of the respondents was from 18-60 years. Majority of the caregivers were form the age range of 18-40 years. The findings showed that most of the caregivers were young as compared to older caregivers. This might be due to the fact that young people have more energy and understanding while older people are fragile and disabilities which increasing with age. Older caregivers face more difficulties in coping with their caregiving duties. It was easy for younger caregivers to provide care to persons with dementia than older caregivers. [19]

Descriptive analysis for the persons with dementia (See Table 2) showed that there was a slight gender differences between men and women. Life expectancy for women is higher than However, many previous studies have quoted non-significant differences between men and But few studies have suggested that the risk of dementia is higher in women as compared to men. The results can vary across different countries and over time (Alzheimer's Association, 2017). Individuals with dementia above the age of 50 were included in the study. Higher number of persons with dementia was from the age range of 50-90 years. The reason for this might be due to the fact that age is the strongest risk factor for dementia. So, Alzheimer's disease mostly develops in the age of 65 or older. Younger people may have Alzheimer's disease but they are less likely to develop the disease than older people . [20]

The major aim of the study was to examine link between the burden of caregivers and their quality of life. The findings of the study support the alternative hypothesis that there is a negative relationship exists between the caregiver burden and the quality of life. This indicates (See Table 3) that an increase in the caregiver burden will decrease the quality of life of dementia caretakers. The findings are covary with other studies reported by Srivastava et al., (2016) that a negative association between burden and quality of life suggests that the caregivers` quality of life affected due to the burden of caregiving for dementia [21]

The link between social support and quality of life is also found through this research, the findings show that there is a major relationship between these two variables. This indicates (See Table 3) that an increase in social support of caregivers would also increase the quality of life. Previous studies further validate current findings that the quality of life in caregivers is higher if they have maximum amount of social support available The most possible way through which social support contributes to increase the quality of life for caregivers is to be able to discuss the problems of caregiving with others, along with increased emotional support. [20]

The demographic variables of the present study were a) age, b) duration of care provided, c) socioeconomic status duration of care provided and d) caregiver relationship. These variables have significant effect on the domains of quality of life. While other variables such as gender, education and number of caregivers was the non-significant predictors of quality of life. Hierarchical regression model showed that out of all the demographic variables, age was found to be significant negative predictor of physical quality of life. One explanation for this would be that with increasing age, family members lose their physical abilities to take care of elderly. One model of caring was indicated in a study that more attention should be paid to include more family members and motivate young members in the caring process, and teach them the basics for providing such care too. [16]

Another hypothesis of the study was that the burden of caregivers and social support would possibly predict the quality of life. Study findings indicated the quality of life among caregivers predicted by both burden of the caregiver and social support. A possible explanation for the strong correlation between these variables showed that caregivers expected to have a higher degree of family support would in turn be correlated with low burden and a higher quality of life in caregiving In this study, hierarchical regression showed a significant negative effect of caregiver burden on all four domains of quality of life: physical health, psychological health, social relationship and environment. A possible reason might be that the higher level of caregiver burden reduces the quality of life, because caregiving is a continuing process and by the time, the caregivers get exhausted and their quality of life got affected badly. As

studies suggested that the quality of life is significantly influenced in caregivers with dementia patients. [22]

Conclusion:

The current study examined the impact of psychosocial factors on quality of life among the caregivers of people with dementia. In the modern era, it is important to focus on the quality of life of caregivers, especially in a country like Pakistan where caregivers provide most of the care to their older family member. The negative experience of caregivers can influence the individuals with dementia continuity of care, compliance with treatment and social support. Then, it becomes a vicious cycle. Therefore, individuals with dementia should be treated as a group together with their families, and treatment should focus not on the patients, but also on their caregivers as well. In addition, physicians and clinicians should make efforts to enable caregivers to engage in more religious and spiritual activities and to inspire caregivers with hope and optimism. Improving the quality of life of caregivers will also not only assist them, but will also have a positive effect on the result of the condition of an individual with dementia. However, quality of life linked negatively with the burden of caregiver and positively with social support.

Disclosure /Conflict of interest:

Authors declare no conflict of interest.

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Original Article

Prevalence Of Kinesiophobia And Discontentment In Post Laminectomy Patients And Its Impact On Physical Activities; A Cross-Sectional Study

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Abstract

Objective: This study aimed to assess the levels of kinesiophobia, satisfaction, and physical activity among early post-laminectomy patients and to determine their interrelationship.

Study Design: An descriptive cross-sectional study was conducted.

Place and duration of study: The study was conducted from January 20 to June 20 during a span of six months among post-laminectomy patients presenting to the physical therapy Out-Patient Departments (OPDs) of Prime Teaching Hospital and Irfan General Hospital, Peshawar.

Material and Methods: The study included 126 post-laminectomy participants aged 1 to 12 weeks. Using the non-probability convenience sampling method, we collected data through questionnaires from Prime Teaching Hospital, Peshawar, and Irfan General Hospital. For kinesiophobia, the Tampa scale, for post-operative satisfaction or dissatisfaction, the Surgical Satisfaction Questionnaire (SSQ8), and for physical activity in post-laminectomy patients, the International Physical Activity Questionnaire (IPAQ), were used.

Results: The mean age was 44.1 ± 9.6 years, with 71 (56.3%) males. High Kinesiophobia was reported by 46 (36.5%) participants, and low satisfaction by 55 (43.6%). Low physical activity levels were observed in 56 (44.4%) patients. A significant negative correlation was found between kinesiophobia and physical activity ($r = -0.42$, $p < 0.01$), as well as between dissatisfaction and activity level ($r = -0.38$, $p < 0.01$)..

Conclusion: : It's concluded that post-laminectomy patients with high kinesiophobia and dissatisfaction demonstrated markedly lower physical activity levels, indicating that psychological factors (Kinesiophobia) substantially influence postoperative recovery and quality of life.

Keywords: Laminectomy, kinesiophobia, patient satisfaction, physical activity, spinal stenosis, rehabilitation

1. Introduction

Low back pain and degenerative spinal disease are two of the most prevalent musculoskeletal conditions globally, causing a significant amount of long-term disability and compromised quality of life.[(1)] For most patients who suffer from spinal canal stenosis, disc herniation, or other degenerative alterations, lumbar laminectomy continues to be one of the most common surgical procedures.[(2)] Decompression of neural structures, pain relief, and restoration of functional mobility are the major goals of this surgery.[(3)] Laminectomy is a common surgical procedure performed to relieve neural compression due to spinal stenosis or disc herniation. Postoperative recovery, however, is not limited to structural healing but also involves the restoration of functional mobility and psychological readiness to move.[(4)] Kinesiophobia is an excessive and irrational fear of physical movement or activity, often stemming from a past painful injury or a fear of future injury or reinjury .[(5)] Laminectomy has been deemed effective in diminishing radiculopathy and neurological compromise, results are highly variable, and most patients still

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have limitations in functional living and physical activity well postoperatively.[6] Variability is increasingly seen as not only due to surgery but also to psychological and behavior determinants of recovery. [7]

One of the major psychological concepts in shaping postoperative recovery is kinesiophobia. [8] Individuals who develop kinesiophobia tend to use fear-avoidant habits by voluntarily restricting themselves from engaging in threatening movement and activities. Though this avoidance will relieve short-term discomfort, it usually leads to muscle weakness, decreased endurance, loss of mobility, and development of functional disability. [9] Eventually, the psychological weight of fear, coupled with the physical price of immobility, can be more disabling than the original spinal pathology itself. [10] The fear, avoidance, and deconditioning cycle is now well established as a key ingredient to spinal disorder chronic pain disability. [11]

The other key determinant of postoperative results is patient satisfaction. Spine surgery satisfaction is an outcome that is complex and multidimensional, and it is influenced by pain relief, functional gain, psychosocial factors, preoperative expectations, and demographics. [12] Patients with low satisfaction or discontent show less adherence to rehabilitation procedures, slower return to work, and reduced overall quality of life. Notably, dissatisfaction does not necessarily correlate with technical failure in surgery, but instead it can be a sign of unmet expectations, chronic pain, or psychosocial distress. [13] When compounded by kinesiophobia, discontentment also limits physical activities further, essentially negating the success of surgery. [14]

Postoperative dissatisfaction and kinesiophobia can also influence each other in a compound effect on the outcomes of rehabilitation.[15] Dissatisfied patients with the outcome of their surgery have higher probabilities of suffering from anxiety, depression, and frustration, which all compound avoidance behaviors. Likewise, patients who have a fear of movement are more prone to view their surgical outcome as poor, independent of real clinical improvements.[16] This bidirectional association not only influences functional independence but also retards the natural recovery course, enhancing the risk of long-term disability. [11]

Fear of physical activity after a laminectomy can hinder patients from participating in activity of daily life.[17] This can lead to secondary complications like weight gain, cardiovascular deconditioning, stiffness of joints, and overall health-related quality of life deterioration. [18] In addition, from a healthcare point of view, patients with unsettled postoperative psychological barriers will be more likely to need extended rehabilitation, multiple medical consultations, or revision surgery, and hence raise healthcare expenditure and burden. [19]

While significant attention has been given to technical optimization of laminectomy techniques and avoidance of intraoperative and postoperative complications, the psychosocial consequences of surgery are relatively unexplored. [20] The frequency of kinesiophobia and patient dissatisfaction, and their joint contribution to engagement in physical activity, is an area of increasing clinical significance. [21] Knowledge of these variables is crucial to maximizing long-term outcome and to directing the formulation of holistic management plans that go beyond the operative act to include psychological care, patient education, and behavioral rehabilitation. [22]

Previous studies have explored the relationship between kinesiophobia and physical activity in general orthopedic or chronic low back pain populations. [23] but limited evidence exists regarding these associations in early post-laminectomy patients, particularly within the Pakistani healthcare context where postoperative rehabilitation practices and patient education vary widely.

Therefore, this study aimed to assess the levels of kinesiophobia, satisfaction, and physical activity among early post-laminectomy patients and to determine their interrelationship .

2. Materials & Methods

The descriptive cross-sectional study was conducted from January 20 to June 20 during a span of six months among post-laminectomy patients presenting to the physical therapy Out-Patient Departments (OPDs) of Prime Teaching Hospital and Irfan General Hospital, Peshawar. the sample size was calculated based on a 95% confidence level, 5% margin of error, 80% power, and an assumed prevalence of 50%, resulting in an effect size (Cohen's w) of 0.3 and a required minimum of 119 participants, with 126 enrolled

Ethical approval was given by the City University of Science and Information Technology (CUSIT) Ethical Review Committee and the respective hospitals, and written informed consent was taken from all participants before enrollment. Eligible candidates were male and female patients aged 35–55 years and who were between 1 to 12 weeks post-surgery, whereas those with spinal procedures other than laminectomy, those with significant comorbidities like infections, deep vein thrombosis, or osteoarthritis, or who refused consent were excluded. Data collection was conducted using standardized, validated instruments such as the Tampa Scale of Kinesiophobia (TSK) to measure fear of movement and re-injury, the International Physical Activity Questionnaire (IPAQ) to measure physical activity levels, and the Surgical Satisfaction Questionnaire (SSQ-8) to measure patient satisfaction following surgery. These instruments offered information on the prevalence of kinesiophobia, dissatisfaction, and how it relates to physical activity levels in the post-laminectomy population. Descriptive statistics (means, standard deviations, and frequencies) were used to summarize participant characteristics and scale scores. Associations between categorical variables (e.g., levels of kinesiophobia and physical activity categories) were assessed using Chi-square tests, while Pearson correlation was applied to evaluate relationships between continuous variables (TSK, SSQ-8, and IPAQ scores). A multiple linear regression model was performed to determine predictors of physical activity, with kinesiophobia and satisfaction as independent variables. A p-value < 0.05 was considered statistically significant.

Data were gathered under strict confidentiality and analyzed with SPSS version 23 to examine associations between psychosocial outcomes and clinical outcomes. Through an emphasis on these interdependent factors, the research sought to emphasize how psychological impediments and dissatisfaction could impact the efficacy of laminectomy in restoring functional independence and engagement in physical activity.

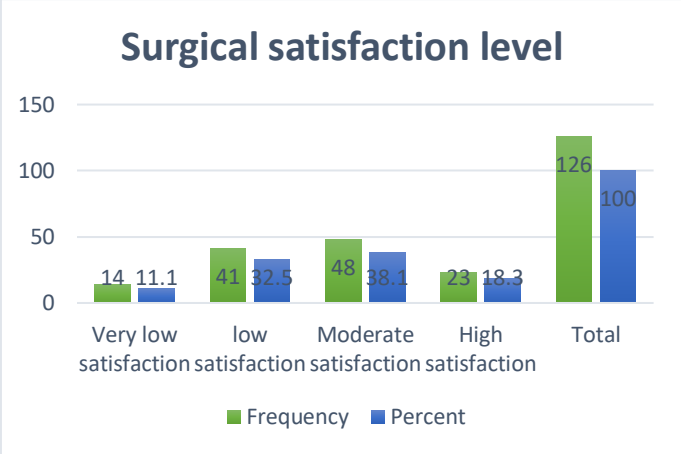
3. Results

Descriptive Statistics

TABLE OF RESULTS		
Characteristics		**N+%**
AGE	YEAR±SD	**44.10±9.635**
GENDER	MALE	71(56.35%)
	FEMALE	55(43.65%)
SURGICAL SATISFACTION LEVEL	VERY LOW SATISFACTION	14 (11.11%)
	LOW SATISFACTION	41 (32.5%)
	MODERATE SATISFACTION	48 (38.09%)
	HIGH SATISFACTION	23(18.3)
LEVEL OF KINESIOPHOBIA	LOW KINESIOPHOBIA	23(18.3)
	MODERATE KINESIOPHOBIA	57(45.2)
	HIGH KINESIOPHOBIA	46(36.5)
LEVEL OF PHYSICAL ACTIVITY	LOW LEVEL OF PHYSICAL ACTIVITY	56(44.4%)
	MODERATE LEVEL OF PHYSICAL ACTIVITY	66 (52.4%)
	HIGH LEVEL OF PHYSICAL ACTIVITY	4 (3.2%)

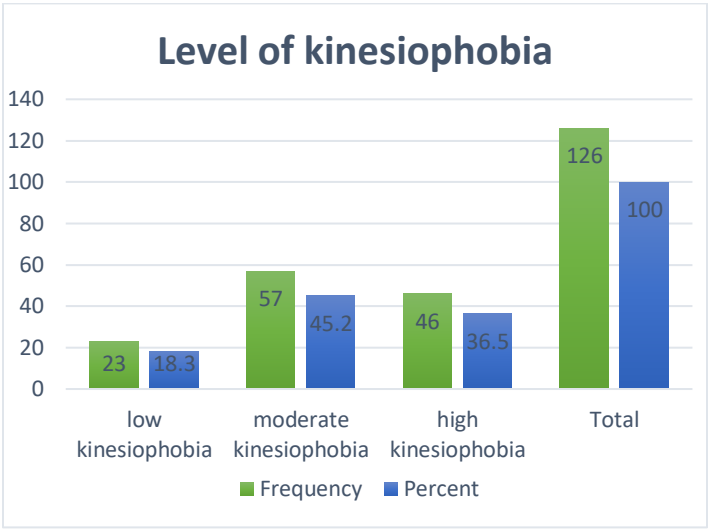
The table shows that the participants had a mean age of 44.10 ± 9.635 years. Among them, 71 (56.35%) were male and 55 (43.65%) were female. Surgical satisfaction outcomes revealed that 14 (11.1%) reported very low satisfaction, 41 (32.5%) reported low satisfaction, 48 (38.1%) reported moderate satisfaction, and 23 (18.3%) reported high satisfaction with surgical intervention. Regarding kinesiophobia, 23 (18.3%) participants had a low level, 57 (45.2%) had a moderate level, and 46 (36.5%) had a high level of kinesiophobia. In terms of physical activity levels, 56 (44.4%) participants reported low activity, 66 (52.4%) moderate activity, and 4 (3.2%) high activity.

Frequency of surgical satisfaction



Out of 126 participants, 14 (11.1%) reported very low satisfaction, 41 (32.5%) reported low satisfaction, 48 (38.1%) reported moderate satisfaction, and 23 (18.3%) reported high satisfaction. The mean satisfaction score was 2.63 with a standard deviation of 0.909.

Level of kinesiophobia in post laminectomy patients



Based on assessment, 23 (18.3%) participants had low kinesiophobia, 57 (45.2%) had moderate kinesiophobia, and 46 (36.5%) had high kinesiophobia. The mean score was 2.17 with a standard deviation of 0.728.

Table 2: Association Between Kinesiophobia, Satisfaction, and Physical Activity Levels

Variable Association	χ^2 Value	df	p-value	Interpretation
Kinesiophobia × Physical Activity	14.82	4	0.002*	Significant
Satisfaction × Physical Activity	10.47	2	0.015*	Significant
Gender × Kinesiophobia	1.93	2	0.38	Not significant
BMI × Physical Activity	3.84	2	0.15	Not significant

Table 2 shows that the Chi-square analysis revealed significant associations between kinesiophobia and physical activity levels ($\chi^2 = 14.82$, df = 4, p = 0.002) and between satisfaction and physical activity levels ($\chi^2 = 10.47$, df = 2, p = 0.015). These results indicate that patients with higher fear of movement and lower satisfaction were more likely to report reduced physical activity after a laminectomy. In contrast, no significant

association was found between gender and kinesiophobia ($\chi^2 = 1.93$, $p = 0.38$) or between BMI and physical activity ($\chi^2 = 3.84$, $p = 0.15$),

Table 3 Multiple Linear Regression Analysis Predicting Physical Activity

Predictor	β (Standardized)	SE	t-value	p-value	95% CI
Constant	—	—	4.83	<0.001	—
Kinesiophobia (TSK)	−0.45	0.08	−5.41	<0.001	−0.61 to −0.29
Satisfaction (SSQ-8)	0.37	0.09	4.21	<0.001	0.20 to 0.54

Table 4 Comparison of Mean Scores of Kinesiophobia, Satisfaction, and Physical Activity by Gender (Independent Samples t-test)

Variable	Gender	Mean ± SD	t-value	p-value	Interpretation
Kinesiophobia Score (TSK)	Male	37.45 ± 5.28	1.42	0.158	NS
	Female	38.81 ± 6.01			
Satisfaction Score (SSQ-8)	Male	24.39 ± 3.65	2.74	0.007*	Significant
	Female	22.57 ± 4.02			
Physical Activity (IPAQ)	Male	1512 ± 698	2.12	0.036*	Significant
	Female	1304 ± 672			

Table 4 shows that no significant gender difference in Kinesiophobia scores ($p = 0.158$), indicating that both male and female patients reported similar levels of fear of movement after laminectomy. However, male participants demonstrated significantly higher satisfaction scores ($M = 24.39 \pm 3.65$) compared to females ($M = 22.57 \pm 4.02$; $p = 0.007$). In addition, males showed greater physical activity levels ($M = 1512 \pm 698$) than females ($M = 1304 \pm 672$; $p = 0.036$). These findings suggest that gender influences both satisfaction and postoperative physical activity, though it does not appear to affect kinesiophobia.

4. Discussion

In this research, 126 patients were recruited after completing the selection requirements. The main goal was to assess the degree of fear, satisfaction, and their impact on post-laminectomy patients' physical activity, aiming to enhance clinical decision-making during the postoperative period. This research adhered to the suggested healing time of 1–12 weeks following surgery. [24] During the recovery period, patients faced a number of challenges, including kinesiophobia (fear of movement), dissatisfaction with surgical results, and restrictions in physical activity. The results showed that during 1–12 weeks after laminectomy, 81.7% of the subjects had a high level of kinesiophobia, 43.6% had low satisfaction with surgery, and 44.4% had a low rate of physical activity. Laminectomy was undertaken for several indications, including degenerative spinal stenosis, fractures, primary and secondary spinal tumors, and nerve compression due to disc-related conditions like disc prolapse and stenosis due to disc extrusion. Rehabilitation after laminectomy needs the right kind of physiotherapy, as kinesiophobia (fear of movement) has been known to be an important hindrance to recovery. [20] There is evidence to indicate that pain-related fear may interfere with recovery more than pain itself, with fear of movement with discomfort being a predictor of subsequent disability and general health outcomes. Kinesiophobia has been demonstrated to have a detrimental effect on the outcome of physiotherapy in patients with back pain and is commonly seen in those with chronic pain. In order to quantify this construct, Miller, Kori, and Todd created the Tampa Scale for Kinesiophobia (TSK) in 1990. This valid and reliable instrument comprises 17 items scored on a 4-point Likert scale (range 1 = strongly disagree to 4 = strongly agree), with an overall score of 68. A score greater than 37 suggests the existence of kinesiophobia. [25] The Tampa Scale of Kinesiophobia consists of 17 items with four options: 1-strongly disagree, 2-disagree, 3- agree, and 4-strongly agree, for a total score of 68. A score ≥37 indicates kinesiophobia. This study also investigated postoperative dissatisfaction and the degree of physical activity in patients undergoing laminectomy. [24] Current literature identifies that

kinesiophobia may lead to psychological problems such as depression, anxiety, and increased fear related to pain, leading eventually to postoperative disability. Fear of movement has been reported not just in patients with chronic pain but in acute and even individuals without pain. Laminectomy is most commonly warranted in spinal disc disorders, including disc protrusion or lumbar canal stenosis. [26] Yet, persistent postoperative pain can still lead to disuse syndrome, defined by diminished use of the spine, changed trunk muscle anatomy, inactivity, and limitations in daily functioning factors closely associated with surgical failure. In comparison to previous studies, our findings show a higher proportion of patients with severe kinesiophobia (81.7%) than that reported by Monticone et al. (2021) and Tagliaferri et al. (2022), who found moderate fear levels in post-lumbar surgery cohorts .This contrast may reflect differences in cultural pain perception, early mobilization protocols, and patient education strategies. While prior research emphasized the role of cognitive behavioral therapy in reducing fear-avoidance behavior, our participants received routine physiotherapy without structured psychological support, potentially explaining the stronger association between kinesiophobia and reduced activity.

Similarly, the observed dissatisfaction rate (43.6%) diverges from that of previous investigations in Western contexts, such as Park et al. (2020) and Ahmed et al. (2021), where multidisciplinary rehabilitation yielded greater satisfaction. The discrepancy may stem from limited postoperative counseling, inconsistent follow-up, and socioeconomic barriers affecting continuity of care in our population.

Although earlier studies have consistently identified fear of movement as a negative predictor of physical function, many focused primarily on supportive evidence rather than exploring contradictory or context-specific factors. In contrast, our study critically highlights that sociocultural beliefs—such as perceiving movement as harmful after surgery—could exacerbate kinesiophobia, particularly in developing regions where patient education is less emphasized.

Moreover, our results expand existing literature by revealing that satisfaction levels significantly predict physical activity outcomes, aligning with but also extending the conclusions of Hart et al. (2023), who emphasized psychological readiness as a stronger determinant of postoperative recovery than pain intensity. The inclusion of both psychological and behavioral variables in our analysis provides a more holistic understanding of recovery trajectories in post-laminectomy patients.

In summary, 81.7% of post-laminectomy patients had high kinesiophobia, 43.6% showed low satisfaction, and 44.4% had low levels of physical activity, all of which highlight the necessity for future. These findings underscore that variations in healthcare access, physiotherapy protocols, and patient attitudes toward movement can markedly influence recovery outcomes. Thus, integrating psychological screening and patient education into postoperative rehabilitation programs could enhance satisfaction, reduce kinesiophobia, and promote sustained physical activity.

Conclusion:

Both kinesiophobia and dissatisfaction occur frequently in post-laminectomy patients and are instrumental in constraining physical activity and diminishing quality of life in general. Fear of movement frequently leads to low levels of restricted activity, which can protract recovery, foster physical deconditioning, and predispose to chronic pain and long-term disability. Similarly, unhappiness with surgical results or continued pain further exacerbates these difficulties, forming a pattern of inactivity, persistent pain, and degraded quality of life.

Limitations

One of the drawback was the limited duration, size of sample and only target two surgical infirmaries so that were we not generalized our results to the whole targeted population. Due to the above-mentioned limitations we used convenience sampling technique that may have led to selection bias.Differences in postoperative care standards recognizing differences in

pain management, rehabilitation techniques, and follow-up policies could have impacted both the outcome for patients and the reported incidence of kinesiophobia and dissatisfaction. Since the current study had a cross-sectional design, it only offered a point-time measurement of kinesiophobia and dissatisfaction, without observing changes in them following the postoperative recovery phase**.**

Future Recommendations

Future studies should focus on management protocols and add constant follow-up schedule.

Disclosure /Conflict of interest:

Authors declare no conflict of interest.

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Original Article

Factors affecting Non-Adherence to Pulmonary Tuberculosis Treatment Among Patients at the Institute of Chest Diseases Kotri

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Abstract

Objective: This study aimed to assess Factors Affecting Non-Adherence to Pulmonary Tuberculosis Treatment Among Patients at the Institute of Chest Diseases, Kotri.

Study Design: : An analytical cross-sectional study was conducted.

Place and duration of study: An analytical cross-sectional study was conducted using a quantitative approach among 212 TB patients registered at a Directly Observed Treatment.

Material and Methods: An analytical cross-sectional study was conducted using a quantitative approach among 212 TB patients registered at a Directly Observed Treatment, Short-course (DOTS) center in Kotri, Sindh, Pakistan. Data were collected on demographics, socio-economic status, knowledge about TB, and self-reported adherence levels. Statistical analyses, including Chi-square tests, were applied to assess associations between adherence and selected variables.

Results: The majority of participants (86.8%) demonstrated low (44.3%) or medium (42.5%) adherence, while only 13.2% achieved high adherence. The mean age of participants was 43.69 ± 10.2years. Age did not show a significant relationship with adherence; however, non-adherence was strongly associated ($p < 0.001$) with male gender, marital status, low education, reduced family income, and rural occupation. Additionally, systemic barriers such as inadequate follow-up and lack of counseling significantly contributed to poor adherence.

Conclusion: The findings highlight that socio-demographic, economic, knowledge-related, and systemic challenges are strongly linked to poor TB treatment adherence. Addressing these through community-based, patient-centered interventions focusing on financial support, improved access to care, and enhanced health education is essential to improve adherence and reduce TB-related morbidity and mortality in high-burden regions such as Kotri, Sindh, Pakistan.

Keywords: Tuberculosis, Treatment Non-Adherence, Factors, Adherence ,knowledge

1. Introduction

Tuberculosis (TB) remains a leading global health concern. In 2025, an estimated 10.8 million people developed TB worldwide, corresponding to 134 cases per 100,000 population, with 1.25 million deaths reported in 2023. [(1)] Pulmonary TB, caused by Mycobacterium tuberculosis, primarily affects the lungs but can spread systemically. [(2)] Non-adherence to anti-TB treatment is a critical challenge, leading to treatment failure, higher mortality, ongoing transmission, and the emergence of drug-resistant TB strains. [(3)] Effective management requires adherence rates above 90%. TB transmission occurs through airborne droplets, highlighting the urgency of early diagnosis and strict treatment adherence. [(4)] Since 2000, global efforts have saved an estimated 79 million lives, though TB eradication by 2030 remains a key WHO and UN Sustainable Development Goal. Non-compliance, whether through irregular dosing, early discontinuation, or refusal of therapy, is influenced by demographic, socioeconomic, psychological, and cultural factors, with consequences including multidrug-resistant (MDR-TB)and extensively drug resistant TB

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(XDR-TB). [5] Following COVID-19, TB has re-emerged as the deadliest infectious disease globally. [6] The WHO South-East Asia Region accounted for 45% by Africa (24%) and the Western Pacific (17%). Twelve countries, including India, Indonesia, China, Pakistan, and Nigeria, represented 87% of the global burden.[12] Risk factors such as undernutrition (0.96 million cases), alcohol use (0.75 million), smoking (0.70 million), HIV (0.61 million), and diabetes (0.38 million) further complicate outcomes. **(7)** Nearly half of TB-affected households face catastrophic costs, exceeding 20% of annual income. **(8)** Drug-susceptible TB is treated with a 6-month regimen of first-line drugs, while drug-resistant TB requires longer, more toxic, and costlier regimens. **(9)** New shorter regimens, such as 4-month moxifloxacin-based and 6-month BPaL protocols, show promise but face implementation barriers.[18] Adherence is hindered by side effects, pill burden, poor health literacy, mental health disorders, and substance use. **(10)** In Pakistan, stigma significantly impedes treatment, with many concealing diagnoses due to fear of rejection or job loss. **(11)** Logistical barriers, such as long travel distances, healthcare staff shortages, and drug stock-outs, further compromise adherence. **(12)** Although Directly Observed Treatment Short-Course (DOTS) remains central, real-world challenges limit its acceptability. Digital adherence tools show potential but require technological access. **(13)** Adherence is also shaped by poverty, unemployment, and housing instability, with adverse drug reactions frequently prompting treatment discontinuation. Despite extensive research, gaps remain in context-specific data from high-burden areas like Sindh. **(14)** Pakistan ranks among the top 30 high-burden countries, contributing 6% of the global TB burden, with 611,000 new cases reported in 2021. **(15)** Non-compliance persists due to poverty, malnutrition, low literacy, stigma, side effects, and systemic healthcare deficiencies. **(16)** In 2022, undernutrition caused 2.2 million new TB cases globally, while HIV, smoking, alcohol, and diabetes further undermined treatment outcomes. **(17)** Addressing these multifactorial barriers is essential to improve adherence and reduce TB morbidity and mortality.

2. Materials & Methods

The WHO South-East Asia Region accounted for 45% Study Design: An analytical cross-sectional study was conducted at the study at the Institute of Chest Diseases Hospital Kotri, Sindh. A non-probability purposive sampling technique was used. Sample size: The sample size was calculated using a formula, 95% confidence level, a 5% margin of error, alpha 0.05, and P=16.5% from a previous study a sample of 212 considered.Duration of the Study: The study was conducted March to August 2025. Patients aged 18 years and above.All Tuberculosis Patients who took anti TB medication at least for one month.Willing to participate and provide informed consent Exclusion Criteria atients aged below 18 years.TB Patients who were seriously ill and or unable to hear and speak will excluded.Those unwilling to provide informed consent.

3. Results

TABLE 1. SOCIO-DEMOGRAPHIC PROFILE OF THE STUDY PARTICIPANTS (n=212)

Variables	Frequency	Percentage
Age of Participants		
18-24 years	39	18.4%
25-31 years	21	9.9%
32-38 years	25	11.8%
39 > above	127	59.9%
Total	212	100.0%
Gender of Participants		
Male	148	69.8 %
Female	64	30.2 %
Total	212	100.0 %
Marital Status of Participants		
Un-married	42	19.8 %
Married	152	71.7 %
Divorced	5	2.4 %
Widow	13	6.1 %

Total	212	100.0 %
Educational Status		
Illiterate	128	60.4 %
Literate	84	39.6 %
Total	212	100.0 %
Family Income		
10k-15k	110	51.9 %
16k-25k	52	24.5%
26k-35k	50	23.6%
Total	212	100.0%
Residence		
Rural	160	75.5%
Urban	52	24.5%
Total	212	100.0%
Distance from Residence to Health Facility		
5-10 km	51	24.1 %
11-20 km	34	16.0 %
21-30 km	28	13.2 %
>30 km	99	46.7%
Total	212	100.0%
Cost of Travel		
100-300 rupees	52	24.5%
400-600 rupees	51	24.1%
>1000 rupees	109	51.4%
Totals	212	100.0%

Table 1 presents participants' socio-demographic characteristics. Most were above 39 years (59.9%), male (69.8%), and married (71.7%). A majority were illiterate (60.4%), and over half reported low family income of PKR 10,000–15,000 (51.9%). Most resided in rural areas (75.5%). Nearly half (46.7%) lived more than 30 km from a health facility, and more than half (51.4%) incurred travel costs exceeding PKR 1000.

Figure 1. Education status of the Participants (n=212)

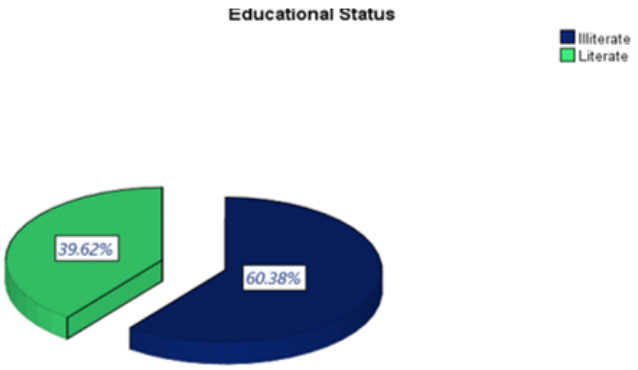

Figure 1. shows that most participants (60.38%) were illiterate, while 39.62% were literate. Education significantly influences health behaviors; illiteracy may limit understanding of illness and treatment, leading to non-compliance, whereas literate individuals are more likely to follow medical advice and adhere to prescribed regimens.

TABLE 2: KNOWLEDGE ABOUT TUBERCULOSIS (n=212)

S.No	Questions	Response	Frequency(n)	Percentage(%)
01	Does a virus cause tuberculosis?	Yes	82	38.7%
		No	130	61.3 %
02	Is it possible to have TB without showing any symptoms?	Yes	106	50.0%
		Yes	106	50.0%
03	Is TB typically treated with a single antibiotic?	Yes	78	36.8%
		No	134	63.2%
04	Can someone with latent TB spread the disease to others?	Yes	118	55.7%
		No	94	44.3%
05	Is a persistent cough one of the common symptoms of active TB?	Yes	94	44.3%
		No	118	55.7%

Table 2 shows mixed knowledge about TB. While 61.3% knew it is not viral and 63.2% knew it requires more than one antibiotic, only 50% recognized asymptomatic cases and 44.3% identified persistent cough as a symptom. Moreover, 55.7% incorrectly believed latent TB is transmissible, indicating substantial gaps in awareness of transmission, symptoms, and disease forms.

Table 3 : Treatment Adherence Category of the study participants (n=212)

Adherence Category	Frequency	Percent
Low	94	44.3 %
Medium	90	42.5 %
High	28	13.2 %
Total	212	100.0 %

Table 3 shows treatment adherence levels: 44.3% had low adherence, 42.5% medium, and only 13.2% high. This indicates substantial non-compliance, raising risks of treatment failure and drug resistance.

Table 4: Association Between Reasons for Non-Compliance and Treatment Adherence (n=212)

S.No	Items	Adherence Category			Total	P-Value
		Low	Medium	High		
01	Adverse drug side effects	7	14	8	29	< 0.000
02	Perceived improvement in symptoms before completion	9	29	7	45	
03	Treatment is not necessary as I am so old	25	30	4	59	
04	Appetite is influenced after taking drugs	28	10	9	47	
05	Forgetfulness or lack of treatment literacy	25	7	0	32	
Total		94	90	28	212	

Table 4: shows a significant association between reasons for non-compliance and treatment adherence (p = 0.000). Adverse drug effects were common across all groups, especially medium adherence (48.3%). Symptom improvement (64.4%) and old age beliefs (50.8%) were also frequent in medium adherence patients, while appetite loss (59.6%) and forgetfulness (78.1%) were predominant in low adherence. These factors strongly influence adherence, particularly among low and medium groups.

4. Discussion

Pulmonary tuberculosis (TB) remains a global health challenge, largely due to non-adherence to multidrug regimens. This study examined socio-demographic, knowledge-related, and systemic predictors of adherence in a low-income, rural population. The mean participant age was 43.7±10.2 years, with findings showing that 86.8% demonstrated low (44.3%) or medium (42.5%) adherence, and only 13.2% achieved high adherence similar to results from Ethiopia (2019). [18]Age showed no significant association with adherence (p=0.073), contrasting with findings from Indonesia (2023). [19] However, gender, marital status, and education were significantly associated with adherence, consistent with a Ghanaian study (2024). Men had higher rates of low adherence, possibly due to work-related pressures in patriarchal settings. Marital status showed an inverse relationship, with married participants reporting lower adherence, echoing findings by Nasrullah et al. (2023). [20] This may reflect competing financial and familial responsibilities that limit treatment compliance. Educational status also demonstrated a strong association (p<0.001). Illiterate participants were concentrated in low- and medium-adherence groups, underscoring the role of poor health literacy. This aligns with knowledge assessments showing that 66.5% had inadequate understanding of TB symptoms and transmission. Family income and residence were likewise significant, with low-income and rural participants disproportionately represented in low adherence, reflecting travel costs (over PKR 1000 for half the sample) and high unemployment (53.8%). These findings support previous evidence from Lakara et al. (2025) and Tadesse et al. (2024), linking poverty, low education, and high travel costs with poor adherence. [21] Systemic and psychosocial barriers also played a decisive role. Inadequate counseling, limited follow-up, and weak patient–provider communication were significantly associated with low adherence. Self-reported reasons included forgetfulness, adverse side effects, and premature treatment cessation due to perceived recovery. Cultural factors such as stigma and behavioral risks like smoking further compounded non-compliance. This study contributes original insights by highlighting context-specific patterns, particularly the unexpected inverse relationship between marital status and adherence, and the nuanced role of gender in a rural, low-income setting. By integrating socio-demographic, systemic, and cultural determinants, it

presents a comprehensive understanding of adherence barriers. The findings point to clear policy implications. TB control programs must expand beyond biomedical approaches toward patient-centered, community-based models. Priorities should include financial and logistical support for low-income and rural patients, reliable medication supply, and tailored health education to improve literacy and correct misconceptions. Such interventions are essential to improve adherence and curb the risks of treatment failure and drug resistance in high-burden regions

Conclusion:

This study highlights that 86.8% of participants had low or medium adherence to TB treatment, driven by socio-demographic, economic, systemic, and psychosocial factors. Male gender, marital status, low income, illiteracy, rural residence, unemployment, and high travel costs were key determinants, compounded by inadequate follow-up, limited counseling, drug side effects, stigma, and misconceptions. These findings stress the need for patient-centered, community-based strategies that address financial and geographic barriers while improving health literacy and continuous support to enhance adherence and reduce TB-related morbidity and mortality

Limitations

One of the drawback was the limited duration, size of sample and only target two surgical infirmaries so that were we not generalized our results to the whole targeted population. Due to the above-mentioned limitations we used convenience sampling technique that may have led to selection bias.Differences in postoperative care standards recognizing differences in pain management, rehabilitation techniques, and follow-up policies could have impacted both the outcome for patients and the reported incidence of kinesiophobia and dissatisfaction. Since the current study had a cross-sectional design, it only offered a point-time measurement of kinesiophobia and dissatisfaction, without observing changes in them following the postoperative recovery phase**.**

Disclosure /Conflict of interest:

Authors declare no conflict of interest.

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Original Article

Short-Form Video Addiction, Mindfulness, And Cognitive Failure Among Undergraduate University Students

Tehniat Shuja ,[1] Wania Wazir ,[2] Zafar Ahmad [3]

Abstract

Objective: This quantitative study aimed to investigate the impact of short-form video addiction and mindfulness on cognitive failures among undergraduate university students.

Place and duration of study: The study was conducted in various health care units of Rawalpindi and Islamabad for 6 months from .

Material and Methods: The Data were gathered through a survey method from undergraduate university students (N = 239) using the convenience sampling technique. The instruments included the Short-form Video Addiction Scale, Mindfulness Attention Awareness Scale, and Cognitive Failure Questionnaire 2.0.

Results: Multiple regression analysis showed that short-form video addiction positively predicts cognitive failures, meaning that participants with higher short-form video addiction experienced higher cognitive shortcomings. Conversely, mindfulness was negatively associated with cognitive failures, indicating that more mindful participants experienced fewer lapses in their cognitive functioning during day-to-day tasks

Conclusion: The findings suggest that mindful students struggle less with cognitive lapses, and mindfulness may help counteract the adverse effects of short-form video addiction. These results provide a foundation for further research on mitigating the cognitive costs of short-form video addiction.

Keywords: *:* Short-Form Video Addiction; Cognitive Failure; Mindfulness

1. Introduction

The internet and social media have reshaped communication and self-presentation, with short-form video applications (SVAs) like TikTok and Instagram Reels gaining massive popularity. TikTok alone has over 2.05 billion users worldwide, including 54.38 million in Pakistan. Despite their brief 1–5 minute format, these videos often foster addictive behaviors through continuous auto-play. While not clinically classified, social media addiction activates the brain's reward system like gambling, posing risks to mental health, relationships, and quality of life. Excessive use of SVAs has been linked to impaired attention, time management, and learning, alongside a global decline in attention spans due to constant information overload. Mindfulness can be cultivated through daily awareness, meditation, and structured interventions [(1)] and is understood both as a trainable state and as a personal trait that varies among individuals. [(2)] Research shows that mindfulness helps individuals regulate fear-based reactions [(3)] , reduces workplace errors and accidents, [(4)] and improves memory, executive control, and academic performance . [(5)] Research shows that frequent context switching during short-form video use negatively impacts memory and attention. [(6,7)] Attention, essential for encoding information into memory, can be trained but is also weakened by constant digital stimulation. Norman (1981) categorized cognitive failures into errors in intention, schema activation, and action triggering. This study focuses on how Short-Form Video addiction and mindfulness interact with these cognitive processes.

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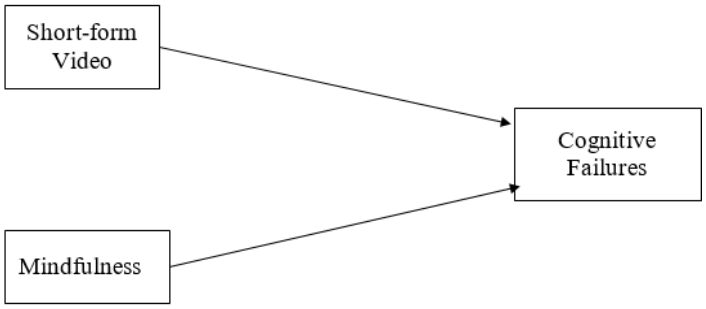
Research shows that excessive internet and social media use, especially short-form video applications like TikTok and Instagram Reels, negatively impacts cognition, attention, and decision-making, often leading to addictive behaviors. [8,9,10] Studies highlight associations between problematic internet use, reduced academic performance, irritability, depression, and cognitive failures such as memory lapses and distractibility. [11,12,13] Neurological evidence suggests internet use overstimulates decision-making regions of the brain, fostering addictive patterns. [14] Media multitasking further reduces cognitive control and attentional focus. [15] In contrast, mindfulness is consistently shown to protect against cognitive failures by enhancing attention, working memory, flexibility, and emotional regulation, with both trait and trained mindfulness linked to improved executive functioning across diverse populations. [16,3,17,5] Overall, while excessive SVA use impairs cognition, mindfulness serves as a protective factor.

Social media use has been explained through conceptual frameworks like Uses and Gratification Theory, which highlights goal-oriented media use to fulfill personal needs, but excessive reliance can lead to irrational dependence and instant gratification tendencies, particularly harmful for students balancing academic goals.[18,19,20] Short-form video applications (SVA) exacerbate cognitive failures by overloading attentional resources, impairing concentration, and fostering internet addiction, which disrupts memory, inhibitory control, and emotional well-being. [9,21,22,23] Theories such as Cognitive Resource Theory and Distraction-Conflict Theory explain these deficits, while the Broaden-and-Build Theory suggests that mindfulness can counteract them by enhancing positive emotions, broadening attention, improving cognitive flexibility, and reducing errors. [24,25,26]

This study aims to examine the impact of short-form video addiction (SVA) and mindfulness on the cognitive functioning of university students. SVA is a relatively newer concept linked to cognitive failures such as memory lapses, attention deficits, and poor decision-making. University students are the key demographic due to their heavy use of these platforms. Prior research suggests that higher mindfulness reduces cognitive failures by improving attention and reducing distractions. [27] However, the direct relationship between mindfulness and cognitive failures remains underexplored, which this study seeks to address.

Conceptual Framework



2. Materials & Methods

This is a quantitative study that followed a cross-sectional correlational design as data were collected via the survey method at a single point in time. The sample size calculated using G-Power was 140; however, the current study employed a sample of 239 undergraduate students in the age range of 18-25 years with access to short-form video applications. 241 responses (Male=106 Female=135) were gathered from which 2 cases were discarded due to one form being empty and the other not meeting the inclusion age criteria, in the age range of 18-25 years old (M = 20.82, SD = 1.80) from all departments of Bahria University, Islamabad, where data was gathered using a convenience sampling technique.

Instruments

Short-form Video Addiction Scale

Short-form video addiction was assessed using the short-form video addiction subscale from the Mobile Phone Addiction Type scale, which was developed by Liu and colleagues in 2022. It has excellent internal reliability as its reported alpha value is 0.89. This self-

report scale has 15 items, which are scored on a 5-point Likert scale ranging from very often to never.

Mindfulness Attention Awareness Scale

Mindfulness was evaluated using the Mindfulness Attention Awareness Scale, [16] which has 15 items rated on a 6-point Likert scale ranging from 1 (almost always) to 6 (almost never). Total scores are calculated by computing the sum and then finding the average. Higher total scores indicate greater levels of mindfulness. The scale has demonstrated good internal consistency reliability, with Cronbach's alpha of 0.82.

Cognitive Failure Questionnaire 2.0

Cognitive failure was measured using the Cognitive Failure Questionnaire 2.0 (CFQ 2.0), which measures attention, memory, maladaptive emotion regulation failure, and cognitive functioning in the everyday life of the individual, considering the past 6 months. The scale has good reliability as its Cronbach's alpha value is 0.80. [28]

Procedure

The study commenced after obtaining permission from the respective authors to use the selected scales. A consent form was attached to the survey, outlining the purpose of the research, ensuring confidentiality, and informing participants of their right to withdraw at any stage. The demographic section collected information on age, gender, socioeconomic status, family type (nuclear or joint), student type (hostelite or day scholar), department, daily time spent on short-form videos, and the applications used. After securing approval from the administration and institutional bodies, the questionnaires were distributed to undergraduate students across various departments at Bahria University. Participants were provided with a brief overview of the study and were encouraged to contact the researchers for any questions during the process, with an email address provided for further clarification. On average, it took participants 15–20 minutes to complete the survey.

3. Results

The demographic characteristics showed that the majority of the participants were females. The students were mostly from the engineering department, followed by the psychology and business departments, and the least number of respondents reported that they were attending a media science course. The respondents mostly came from a nuclear family and attended university as day scholars. The social media application popular for viewing short-form videos was Instagram, followed by YouTube and TikTok. The applications reported in the 'others' category were LinkedIn and Pinterest. The participants, on average, spent 2.78 hours watching short-form videos daily

Table 1

Psychometric Properties of Short-form Video Addiction Scale, Mindfulness Attention Awareness Scale and Cognitive Failures Questionnaire 2.0

No.	Scales	*k*	*M*	*SD*	Range		α
					Actual	Potential	
1	SVA	7	18.83	6.10	7-35	7-35	.83
2	MAAS	15	3.51	.96	1-6	1-6	.87
3	CFQ 2.0	15	22.23	11.04	0-56	0-75	.87

Note. k = number of items; M = mean; SD = standard deviation; N = 239; SVA = Short-form Video Addiction; MAAS = Mindfulness Attention Awareness Scale; CFQ 2.0 = Cognitive Failure Questionnaire 2.0

The measures used in this study, the Short-form Video Addiction Scale, Mindfulness Attention Awareness Scale, and Cognitive Failures Questionnaire 2.0 demonstrated excellent internal reliability as their respective Cronbach's α values were greater than 0.7 when administered on the study's sample.

Table 2

Pearson's Product-Moment Correlation Analysis for Short-form Video Addiction, Mindfulness, and Cognitive Failures in Undergraduate University Students (N = 239)

Variable	*M*	*SD*	1	2	3
1. Short-form Video Addiction	18.83	6.10	-	-.42***	.58***
2. Mindfulness	3.51	.96		-	-.50***
3. Cognitive Failure	22.23	11.04			-

Note. p < .001 = ***; M = mean; SD = standard deviation; SVA = Short-form Video Addiction; MAAS = Mindfulness Attention Awareness Scale; CFQ 2.0 = Cognitive Failure Questionnaire 2.0

The results of Pearson's Product-Moment Correlation showed that short-form video addiction had a significant correlation with cognitive failures, which means that participants with greater levels of SV-addiction had higher levels of cognitive failures. The findings also showed that SV-addiction had a significant negative relation with mindfulness, meaning that the higher the levels of short-form video addiction, the lower the mindfulness in the students. Mindfulness is negatively correlated with cognitive failures.

Table 3

Multiple Linear Regression to Predict Cognitive Failures by Short-Form Video Addiction and Mindfulness (N=239)

Predictors	*B*	*SE*	*B*	*p*	95% *CI*
Constant		3.48	19.77	<.001	[12.91, 26.64]
Short-form Video Addiction	.49	.099	.81	<.001	[.62, 1.01]
Mindfulness	-.32	.63	-3.65	<.001	[-4.90, -2.41]
$R^2 = .418$, $F = 84.91$, $p = <.001$					

Note. SE= standard error, R^2 = coefficient of determination, β = coefficient of regression, SVA = Short-form Video Addiction, MAAS = Mindfulness Attention Awareness Scale, CFQ 2.0 = Cognitive Failure Questionnaire 2.0

The results of multiple linear regression showed that short-form video addiction and mindfulness accounted for 41.8% of the variance in cognitive failures, where short-form video addiction is a significant positive predictor of cognitive failures, whereas mindfulness is a significant negative predictor of cognitive failures in undergraduate university students.

4. Discussion

The present study examined the impact of short-form video addiction and mindfulness on cognitive failures in university students. Short-form video addiction had a significant positive association with cognitive failures, meaning that participants with greater levels of short-form video addiction had higher levels of cognitive failure. Mindfulness as a trait has a significant negative association with cognitive failure, which implies that the presence of higher levels of mindfulness translates to lower levels of cognitive failure. These findings align with past research. (14,7,10,29,9,27,5,30-32)

The positive association of SVA to cognitive failure can be explained using the cognitive resource theory, which says that cognitive failures occur when cognitive resources are depleted due to excessive use of internet-based applications. An individual's

psychological balance can be disrupted because of this, which results in them not being able to pay focused attention to life situations, encode and process information important to perform daily tasks, or make cognitive judgments. This results in cognitive failure. [33,34]. Kohler et al (2023) found that SVA does not produce immediate effects, but people report feeling less concentrated in their daily lives and their attention spans shortening.

The Broaden-and-Build theory states that by practicing mindfulness, a person can enhance their positive emotions and thus be more aware of their environment and experience fewer cognitive errors. [26] Similarly, the distraction-conflict theory states that cognitive performance can be improved by practicing mindfulness, as it could enhance cognitive flexibility. [23]

Results indicate mindfulness and short-form video addiction are negatively correlated. Short-form video addiction is used as a means of escaping from unpleasant events, as described by the Uses and Gratification theory, which says that individuals use short-form video applications to obtain positive emotions and avoid negative emotions. Mindfulness, on the other hand, is based on Buddhist meditation, where the person is aware of their surroundings. A past study performed on a sample of university students found that those with high mindfulness traits scored lower on the social media addiction scale. Mindfulness is not only known to increase metacognitive alertness but also to help develop positive coping mechanisms so that a person becomes less prone to developing addictions .[35] Individuals with a low level of mindfulness lack awareness and the motivation to acquire knowledge from their surroundings. [23]

In the past, mindfulness-based interventions were used for other addictions, such as substance abuse and even video game addictions. Studies show that the practice of mindfulness-based interventions can enhance self-regulation of attention by helping individuals focus attention on present moment events and letting go of their cognitive fixations. By enhancing the regulation of attention, there can be positive effects on coping with negative feelings, unwanted thoughts, and cravings related to addiction. Mindfulness practices are also related to distress reduction as they foster the ability to accept stressful events in life. [36]

Conclusion:

The findings suggest that mindful students struggle less with cognitive lapses, and mindfulness may help counteract the adverse effects of short-form video addiction. These results provide a foundation for further research on mitigating the cognitive costs of short-form video addiction.

Limitations

Some limitations in this study need to be addressed for future research. Firstly, some participants were not aware of their time spent on short-form video applications, in addition to that, some participants did not know where on their mobile phones they could check their screen time. As a result, a few reported their overall phone use time while others gave an estimate. In the future, researchers should add proper instructions on where to access screen time information on mobile phones in the questionnaires and make sure that the participants understand.

Future Recommendations

Some students that provided their information could be under the influence of response bias. Being in an academic setting they may want to play down their use of short-form video applications or provide falsified information when asked to report the number of hours spent on these applications. Thus, in the future better steps should be taken to convince them that their reputations will not be harmed in any way so that they feel at ease to provide accurate details. The participants involved belonged to semi-private university so the generalizability of the results may be limited. Pakistani culture is diverse and in order to represent that the

sample should be expanded in future research to encapsulate students of various backgrounds.

Disclosure /Conflict of interest:

Authors declare no conflict of interest.

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Original Article

Influencing Factors of Breastfeeding Practices in Working Mothers Visiting Tertiary Care Hospitals: A Study at Kotri and Liaquat University Hospital, Hyderabad

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Abstract

Objective: To assess the influencing factors of breastfeeding practices among working women visiting tertiary care hospitals in Hyderabad.

Study Design: A descriptive cross-sectional quantitative study was conducted.

Place and duration of study: The study was conducted at Kotri and Liaquat University Hospitals, Hyderabad, Pakistan, from February to June 2025.

Material and Methods: A total of 359 working mothers of infants aged 0–12 months were recruited using convenience sampling. Data were collected using a structured questionnaire covering demographics, breastfeeding practices, and workplace support. Analysis was performed using descriptive statistics and Chi-square tests (SPSS v26). Statistical significance was set at $p < 0.05$ with a 95% confidence interval.

Results: Most working mothers were 26–35 years (47.6%), had 1–2 children (32.6%–36.5%), and intermediate (42.3%) or undergraduate education (38.7%). The majority were full-time employees (82.7%), with children aged 4–7 months (38.2%), and 56.5% lived in joint families. Overall, 65% were breastfeeding. Continuation was significantly associated with flexible time (36.4%, $p = 0.012$), private room (33.9%, $p = 0.034$), maternity leave (50.8%, $p = 0.005$), and employer-provided information (50.4%, $p = 0.011$). Refrigeration (26.9%), breast pumps (13.6%), nursery facilities (56.8%), and task adjustments (54.3%) were not significant.

Conclusion: Workplace accommodations, including flexible schedules, private lactation spaces, maternity leave, and employer-provided breastfeeding guidance, facilitate breastfeeding continuation among working mothers. Additionally, socio-cultural, family, and individual factors influence breastfeeding practices. Promoting breastfeeding effectively requires interventions that address both workplace policies and broader personal and social determinants

Keywords: Breast Feeding; Working Women; Workplace; Maternal Employment, Lactation Maternity Leave, Pakistan

1. Introduction

Breastfeeding is the most natural and optimal source of infant nutrition, providing essential nutrients, immune protection, and developmental benefits during the first six months of life. [1, 2] It reduces the risk of malnutrition, infections, obesity, and certain childhood cancers, while also improving maternal health by lowering the risk of breast and ovarian cancers, diabetes, and postpartum complications. [3-5] The World Health Organization (WHO) and UNICEF recommend exclusive breastfeeding for the first six months, followed by continued breastfeeding with complementary foods up to two years or beyond. [6,7] Despite these global recommendations, breastfeeding rates remain suboptimal. Globally, only 44% of infants under six months are exclusively breastfed, far below the WHO target of 50%.[8,9] Employment status significantly influences breastfeeding continuation, with working mothers less likely to sustain exclusive breastfeeding compared to non-working mothers. [10] In Pakistan, the situation is similar. The national

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Nutrition Survey (2018) reported that only 45.8% of infants were breastfed within the first hour of birth, and 48.4% were exclusively breastfed during the first six months. [11] Studies consistently show that working mothers in Pakistan have much lower breastfeeding rates than non-working mothers, with employment, short maternity leave, and lack of workplace facilities identified as major barriers. [12,13] Within Sindh province, breastfeeding practices are further constrained by sociocultural factors, insufficient counseling, and work-related challenges. Regional studies highlight early discontinuation and reliance on formula feeding, particularly among employed women in urban settings. [14, 15] However, there is limited evidence from tertiary care hospitals in Hyderabad, where a large number of working mothers seek healthcare services.

Given these gaps, it is important to explore the workplace, institutional, and cultural factors that affect breastfeeding among working mothers in this setting.

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2. Materials & Methods

This cross-sectional quantitative study assessed workplace factors influencing breastfeeding practices among working mothers visiting Kotri and Liaquat University Hospitals, Hyderabad, Pakistan. Ethical approval was obtained from the Ethical Review Committee of Liaquat University of Medical & Health Sciences (Ref: NO.LUMHS/REC/-616), along with authorization from the Medical Superintendent and departmental heads. All participants provided informed consent and were briefed on study objectives, procedures, voluntary participation, and confidentiality. The study adhered to the principles of the Declaration of Helsinki. The study population included working mothers aged 14–45 years with infants aged 0–12 months visiting the outpatient departments between February and June 2025. Mothers who were not breastfeeding, had infants with illnesses preventing breastfeeding, or had multiple births were excluded. Convenience sampling was used, and the sample size of 359 participants was calculated using OpenEpi (Version 3) based on a 37.2% prevalence [16], 95% confidence level, and 5% margin of error. Data were collected using a structured questionnaire adapted from validated instruments, covering demographics, breastfeeding practices, and workplace factors. The questionnaire was administered in Urdu and Sindhi in a private setting, requiring approximately 20 minutes per participant. Data analysis was performed using SPSS Version 26. Descriptive statistics summarized demographic characteristics, breastfeeding practices, and workplace factors, while Chi-square tests assessed associations between workplace support and breastfeeding continuation. Statistical significance was set at $p < 0.05$.

3. Results

Participants were mostly aged 26–35 years (47.6%), with the majority having one or two children (32.6% and 36.5%, respectively). Most mothers were educated at the intermediate (42.3%) or undergraduate level (38.7%), employed full-time (82.7%), and living in joint families (56.5%). The children's ages ranged primarily from 4 to 7 months (38.2%). Participants were employed across various sectors, including schools (26.4%), hospitals (25.6%), and government offices (19.7%). Monthly income varied, with 38.3% earning more than PKR 40,000 and 31.7% earning below PKR 20,000 (Table 1).

Table 1. Socio-demographic characteristics of working mothers (N = 359

Variable	Category	Frequency (f)	Percentage (%)
Age of mother	≤25	113	31.5 %
	26–35	171	47.6 %
	≥36	75	20.9 %
Age of the child	0–3 months	93	25.9 %
	4–7 months	137	38.2 %
	8–12 months	129	35.9 %
Monthly income	<20,000	114	31.7 5
	20,000–40,000	107	29.7 5
	>40,000	138	38.3 5
Number of children	1	117	32.6 %
	2	131	36.5 %
	3	73	20.3 %
	≥4	38	10.6 %

Education	Matriculation	68	18.9 %
	Intermediate	152	42.3 %
	Undergraduate	139	38.7 %
Employment type	Full-time	297	82.7 %
	Part-time	62	17.3 %
Family type	Joint	203	56.5 %
	Nuclear	156	43.5 %
Workplace	Hospital	92	25.6 %
	School	95	26.4 %
	Government office	71	19.7 %
	Bank	19	5.3 %
	Other	82	22.8 5

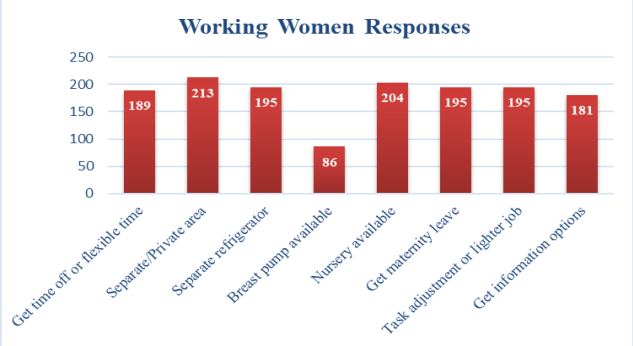
Breastfeeding Practices of Working Mothers

More than half of the participants (51.3%, n = 184) were currently breastfeeding. Nearly half (47.6%, n = 171) breastfed 4–6 times daily, while 41.2% (n = 148) introduced complementary feeding at 6 months. Difficulties after returning to work were reported by 31.8% (n = 114).

Table 2. Breastfeeding Practices of Working Mother

Item	Category	Frequency (n)	Percentage (%)
Currently breastfeeding	Yes	184	51.3 %
	No	175	48.7 %
Breastfeeding frequency per day	1–3 times	113	31.5 %
	4–6 times	171	47.6 %
	>6 times	75	20.9 %
Age of complementary food initiation	Before 6 months	92	25.6 %
	At 6 months	148	41.2 %
	After 6 months	119	33.1%
Faced difficulties after returning to work	Yes	114	31.8 %
	No	245	68.2 %

Figure 1. Proportion of working mothers reporting availability of workplace supports



Association between Workplace Factors and Breastfeeding Continuation Chi-square analysis revealed significant associations between breastfeeding continuation and several workplace factors, including flexible hours (p = 0.037), private room availability (p = 0.016), refrigerator availability (p = 0.020), nursery facilities (p = 0.004), maternity leave (p = 0.020), task adjustments (p < 0.001), and employer-provided information (p = 0.005). Breast pump availability showed borderline significance (p = 0.050). Task adjustments during lactation showed the strongest association, with mothers receiving adjustments significantly more likely to continue breastfeeding (77.4% vs 20.1%). These findings are summarized in Table 3.

Table 3. Association of workplace factors with breastfeeding continuation

Workplace Factor	Category	Breastfeeding Practice: Yes (f, %)	Breastfeeding Practice: No (f, %)	χ^2 value	df	p-value
Flexible time to express breast milk	Yes	87 (46.0%)	102 (54.0%)	4.36	1	0.037*
	No	97 (57.1%)	73 (42.9%)			
Private room availability	Yes	98 (46.0%)	115 (54.0%)	5.77	1	0.016*
	No	86 (58.9%)	60 (41.1%)			
Refrigerator availability	Yes	89 (45.6%)	106 (54.4%)	5.38	1	0.020*
	No	95 (57.9%)	69 (42.1%)			
Breast pump availability	Yes	52 (60.5%)	34 (39.5%)	3.84	1	0.050
	No	132 (48.4%)	141 (51.6%)			
Nursery facility availability	Yes	118 (57.8%)	86 (42.2%)	8.21	1	0.004*
	No	66 (42.6%)	89 (57.4%)			
Maternity leave availability	Yes	89 (45.6%)	106 (54.4%)	5.38	1	0.020*
	No	95 (57.9%)	69 (42.1%)			
Task adjustments during lactation	Yes	151 (77.4%)	44 (22.6%)	117.12	1	<0.001*
	No	33 (20.1%)	131 (79.9%)			
Employer breastfeeding info on return	Yes	106 (58.6%)	75 (41.4%)	7.81	1	0.005*
	No	78 (43.8%)	100 (56.2%)			

4. Discussion

This study assessed workplace factors influencing breastfeeding practices among working mothers visiting Kotri and Liaquat University Hospitals,

Hyderabad. The findings provide insights into how workplace supports, socio-demographic characteristics, and employment conditions collectively shape breastfeeding behaviors. The majority of participants were aged 26–35 years (47.6%), consistent with global trends showing that mid-reproductive age women are more likely to be employed and face challenges in sustaining breastfeeding. [17] Maternal age is a recognized determinant of breastfeeding decisions, as older mothers often possess greater confidence and knowledge about breastfeeding, while younger mothers may lack experience or face higher work-related pressures. Children in the study were predominantly aged 4–7 months (38.2%), corresponding to the critical exclusive breastfeeding period recommended by WHO. [18] Despite this, only 41.2% of mothers adhered to exclusive breastfeeding until six months, while 25.6% introduced complementary feeding earlier, reflecting persistent gaps between recommended practices and actual behaviors, as similarly reported in Western Ethiopia and regional Sindh. [19-21] Educational attainment was relatively high, with 81% of mothers having intermediate or undergraduate education. This aligns with literature showing that higher maternal education positively correlates with breastfeeding knowledge, intention, and duration. [22.23] Family structure also influenced breastfeeding practices: 56.5% of participants lived in joint families, which may provide caregiving support but also reinforce traditional norms that limit exclusive breastfeeding, consistent with studies from Pakistan and India. [24-27]

Monthly income was moderately distributed, with 38.3% earning more than PKR 40,000, reflecting that household resources may facilitate access to workplace support and reduce financial pressures associated with childcare. [28.29] Breastfeeding practices in this population revealed both challenges and opportunities. More than half (51.3%) were currently breastfeeding, with 47.6% feeding 4–6 times daily. Early complementary feeding was common, and 31.8% of mothers reported difficulties after returning to work. These findings are consistent with previous studies demonstrating that workload, time constraints, and limited employer support are major barriers to continued breastfeeding. [11.30.31] Workplace supports vary in availability and impact. Flexible time to express milk (52.6%), private lactation rooms (59.3%), refrigerators (54.3%), nurseries (56.8%), and maternity leave (54.3%) were moderately available, but only 54.3% received task adjustments. Statistical analysis confirmed that task adjustments during lactation were the strongest predictor of breastfeeding continuation ($\chi^2 = 117.12$, $p < 0.001$, $\Phi = 0.571$). Flexible time ($\chi^2 = 4.36$, $p = 0.037$), private room availability ($\chi^2 = 5.77$, $p = 0.016$), refrigerator availability ($\chi^2 = 5.38$, $p = 0.020$), nursery facilities ($\chi^2 = 8.21$, $p = 0.004$), maternity leave ($\chi^2 = 5.38$, $p = 0.020$), and employer-provided breastfeeding information ($\chi^2 = 7.81$, $p = 0.005$) also significantly influenced breastfeeding continuation, whereas breast pump availability showed borderline significance ($\chi^2 = 3.84$, $p = 0.050$). These findings support the study hypothesis that workplace factors significantly influence breastfeeding behaviors. Comparisons with previous research highlight both consistencies and unique contributions. Vilar-Compte et al. (2021) reported that formal workplace accommodations, privacy, and employer guidance enhance breastfeeding continuation [6] , consistent with our findings. Tsai (2025) demonstrated that lactation rooms and breast-pumping breaks correlated with longer breastfeeding duration, although colleague support was relevant only in the initial months after returning to work. [32] Unlike some studies in high-income countries where breast pump access strongly influences breastfeeding duration, this study found it less impactful, possibly due to cultural norms, personal preferences, or limited workplace promotion. [33] The study underscores the multifactorial nature of breastfeeding among working mothers, where workplace policies interact with maternal motivation, family support, socio-economic factors, and cultural expectations. Interventions that focus on task adjustments, privacy, and structured employer guidance are likely to yield the greatest benefits.

Conclusion:

The study demonstrates that workplace factors, including flexible schedules, private lactation spaces, maternity leave, task adjustments, and employer-provided breastfeeding guidance, are significantly associated with breastfeeding continuation among working mothers. Task adjustments during lactation had the strongest association. These findings highlight the importance of workplace support in promoting breastfeeding practices among employed mothers.

Strengths and Limitations

This study provides context-specific insights into breastfeeding practices among working mothers in urban Pakistan, using a structured questionnaire and a robust sample of 359 participants. Ethical standards, including informed consent and confidentiality, were maintained, enhancing credibility. Limitations include the use of convenience sampling, limiting generalizability, and the cross-sectional design, which prevents assessment of long-term impacts. Factors such as family support, cultural norms, and psychological influences were not explored, and not all workplace support factors showed statistically significant associations with breastfeeding continuation, indicating the presence of unexamined variables.

Disclosure /Conflict of interest:

Authors declare no conflict of interest.

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Original Article

Comparative Analysis of Isolated Versus Compound Weightlifting Patterns on Core Strength in Female Gym Participants

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Abstract

Objective: To compare the effects of Isolated versus Compound weightlifting patterns on core strength among female gym participants.

Study Design: A comparative cross-sectional study was conducted.

Place and duration of study: A cross-sectional comparative study was carried out on 186 healthy female gym members, aged 20 to 30 years.

Material and Methods: A cross-sectional comparative study was carried out on 186 healthy female gym members, aged 20 to 30 years. The participants were separated into two categories: Isolated weightlifting (n=93) and Compound weightlifting (n=93). Core strength was then evaluated through the Plank Test and Leg Lowering Test. Data analysis was conducted using SPSS v.25, employing the Mann Whitney test for comparison among these groups.

Results: In descriptive analysis, mean and standard deviation of age and BMI came out to be 25.73 ± 2.91 and 25.52 ±15.41 respectively. In inferential analysis, we used Shapiro-wilk test on age and BMI to check the normality. Normality value was 0.001, therefore we used a non-parametric, Mann Whittney test to compare the plank timing and leg lowering angles between compound and isolated weight lifting groups. P-value of both were 0.001 which showed statistically significant differences between compound and isolated weight lifting groups.

Conclusion: Compound weightlifting patterns lead to better core strength than isolated ones among female gym participants. Therefore, including compound exercises can enhance core engagement and overall strength advantages.

Keywords: Compound exercises, Core strength, Isolated exercises, Leg lowering test, Plank test, Weightlifting patterns

1. Introduction

The core muscles are essential for stabilizing the torso, supporting posture, and enabling effective force transfer during dynamic activities. [(1)] Enhancing these muscles not only boosts athletic performance but also lowers the likelihood of musculoskeletal injuries. [(2)] In recent years, weightlifting has gained popularity among female gym participants, with training approaches broadly classified into two groups: isolated exercises, which target a specific muscle group, and compound exercises, which involve multiple joints and muscle groups simultaneously. Isolated patterns are often recommended for targeted hypertrophy or rehabilitation purposes. Women generally have lower core muscle mass than men, influenced by hormonal and anatomical factors, which increases the need for specific core strengthening to prevent lower back pain, pelvic floor dysfunction, and other musculoskeletal issues. [(3)] Although the benefits of weightlifting for strength and posture are well established, there is limited research comparing the effects of isolated versus compound weightlifting patterns on core strength specifically in female gym participants. [(4)] Isolated exercises are used to isolate specific muscles without engaging surrounding muscle groups. While in comparison, compound patterns focus on the execution of more than one joint and muscle group at once and are more favorable in the quest to achieve a balanced level of fitness.

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These drills require greater coordination and muscle recruitment from various regions of the body. Some classic examples of compound exercises are squats, bench press, and deadlifts. All of which target multiple muscle groups, but require a significant amount of core engagement for stability and power output. [5] Although both modalities offer advantages, the evidence regarding their distinct impact on core strength in female groups is still scarce. [6] This study aimed to investigate whether isolated or compound weightlifting patterns elicit greater improvements in core strength.

Beyond enhancing posture and performance, a well-conditioned core also plays a significant role in safeguarding spinal health and facilitating efficient movement mechanics. [7] By supporting optimal alignment and distributing loads evenly during physical activity, core strength can reduce the risk of overuse injuries and improve movement efficiency in both training and daily tasks. [8,9] This is especially relevant for gym-based populations, where exercise intensity and load progression can place considerable demands on trunk stability.

In physiotherapy core strengthening has a major role in reducing lower back pain. Weak core muscles often lead to compensatory movements and strain in the lower back. Strengthening of these muscles reduces the strain from such compensatory movements providing relief. [10]

In addition, weightlifting offers female participants unique physiological benefits that extend beyond muscular development. [4,11] Having a strong core also helps alleviate lower back pain which is one of the main issues women face and aids in child bearing as it also helps avoid excessive bulging due to weak core muscles. During pregnancy, the baby's weight exerts pressure on these muscles. Weak pelvic floor and core muscles can lead to a bulging or sagging pelvic floor which can lead to urinary incontinence (loss of urine when sneezing or coughing). Prolapse of pelvic organs also occurs. Strong pelvic floor muscles prevent excessive bulging or distension, control the increased pressure, and assist in the delivery. Strong core and pelvic floor muscles, Improved posture aids in back pain relief, Reduction of back pain, Improved pushing force during delivery, and faster postpartum recovery during pregnancy due to increased weight of baby. [12] Engaging in structured resistance training can improve bone mineral density, aid in metabolic health, and support hormonal balance, all of which contribute to overall well-being. [13] These benefits highlight the importance of selecting effective training patterns that maximize results while addressing the specific biomechanical and physiological needs of women in resistance-based fitness programs. [14]

2. Materials & Methods

This was a comparative cross-sectional. This study was conducted in various gyms across Islamabad and Rawalpindi, Pakistan, over the course of 6 months. Participants: 186 healthy female gym participants aged 20–30 years were recruited through purposive sampling. Participants were recruited using a non-probability convenience sampling technique. We used Epitool to determine our sample size, applying the standard deviation for the plank test from a previous study as our gold standard for core strength assessment. With a 95% confidence interval, this approach estimated a sample size of 186. [15] Participants were included if they had a minimum of six months of consistent weight training experience, defined as engaging in weight training at least 3 sessions per week, each lasting 30 to 60 minutes, at a moderate to high intensity, with no history of musculoskeletal injury in the past six months. Exclusion criteria included pregnancy, recent surgery, chronic back pain, current injuries, participation in other structured core-specific programs, or the use of medications that could affect core strength or weightlifting performance. Participants were then categorized into the following two groups based on their existing training patterns:

Group A (Isolated weightlifting): Exercises focused on single muscle groups (For example, planks (rectus abdominis, transverse abdominis), and russian twists (obliques

Group B (Compound weightlifting): Multi-joint exercises engaging several muscle groups

simultaneously. For example, squats (quadriceps, hamstrings, gluteus maximus, erector spinae, core stabilizers) and deadlifts (hamstrings, gluteus maximus, erector spinae, trapezius, forearm flexors, and core stabilizers).The Plank Test and Leg lowering Test was used to assess core strength. For Plank test the participants were instructed to perform the plank in a prone position, with elbows placed directly under the shoulders and forearms resting on the ground. The body was maintained in a straight line from head to heels, with the neck neutral, core muscles engaged, gluteal muscles slightly contracted, and hips neither sagging nor elevated. Feet were positioned hip-width apart, and participants were asked to maintain steady breathing throughout the exercise.

As the scoring of the Plank test was in categories, we marked plank time according to categories in SPSS as Category 1 as very poor <15 sec,Category 2 as poor 15-30 sec,Category 3 as below average 30-60 sec,Category 4 as average 1-2 min,Category 5 as above average 2-4 min,Category 6 as very good 4-6 min,Category 7 as excellent >6 minor the leg lowering test For the leg lowering test participants were positioned supine on a flat surface with the pressure biofeedback unit (inflatable cuff) placed beneath the lumbar spine at the level of L4–L5 and inflated to 40 mmHg. Arms were placed alongside the trunk with palms facing downward for stability. Both hips were flexed to 90° with knees extended. Participants were instructed to slowly lower their legs while maintaining the pressure at 40 mmHg by engaging the deep abdominal muscles. Any deviation of more than 10 mmHg from baseline was considered a point of failure, and the angle of hip flexion at that moment was recorded.

The scoring for leg lowering test was also in categories, therefore we marked leg lowering angle according to categories in SPSS as Angle 0 as excellent,Angle 15 as very good,Angle 30 as above average,Angle 45 as average,Angle 60 as below average,Angle 75 as poor, Angle 90 as very poor.Data was analyzed using SPSS v.25. A non-parametric test, Mann Whitney test was used to compare data between groups. A p-value <0.05 was considered statistically significant.An analytical cross-sectional study was conducted at the study at the Institute of Chest Diseases Hospital Kotri, Sindh.A non-probability purposive sampling technique was used.The sample size was calculated using a formula, 95% confidence level, a 5% margin of error, alpha 0.05, and P=16.5% from a previous study a sample of 212 considered. The study was conducted March to August 2025. Patients aged 18 years and above,All Tuberculosis Patients who took anti TB medication at least for one month.‹Willing to participate and provide inform consent.Exclusion Criteria: Patients aged below 18 years,TB Patients who were seriously ill and or unable to hear and speak will excluded,Those unwilling to provide informed consent

3. Results

A total of 186 female gym participants were included, with a mean age of 25.73 ± 2.91 years and mean BMI of 25.51 ± 15.4 kg/m².

Table 1: Frequency and Percentage of Plank Time of Compound Weightlifting Participants

	Frequency	Percentage
Very poor	0	0
Poor	0	0
Below average	0	0
average	21	22.6
Above average	53	57
Very good	18	19.4
excellent	1	1.1

Table 2: Frequency and Percentage of Plank time in Isolated Weightlifting Participants

	Frequency	Percentage
Very poor	2	2.2
Poor	14	15.1
Below average	46	49.5
Average	29	31.2
Above average	2	2.2
Good	0	0
Excellent	0	0

Compound group mean rank 135.70 vs. isolated group 51.30. Mann–Whitney test showed a statistically significant difference (p = 0.001), with compound lifters sustaining plank positions longer.

Table 3: Frequency and Percentage of Leg Lowering Angles of Compound Weightlifting Participants

	Frequency	Percentage
Excellent	22	23.7
Good	32	34.4
Above average	29	31.2
Average	10	10.8
Below average	0	0
Poor	0	0
Very poor	0	0

Table 4: Frequency and Percentage of Leg Lowering Angle of Isolated Weightlifting Participants

	Frequency	Percentage
Excellent	0	0
Good	0	0
Above average	2	2.2
Average	27	29
Below average	37	39.8
Poor	22	23.7
Very poor	5	5.4

Compound group mean rank 48.98 vs. isolated group 138.02, also statistically significant (p = 0.001). Lower angles indicate better core control, showing compound lifters had superior stability.

Table 5: Mean and Standard Deviation of Plank time and Leg lowering of compound weight lifting & Isolated weight bearing participants

Groups	Compound Weightlifting	Isolated Weightlifting
Parameters	Mean ± S.D	Mean ± S.D
Plank time	4.98 ± 0.68	3.16 ± 0.784
Leg lowering angle	19.35 ± 14.26	60.16 ± 13.7

4. Discussion

This study set out to compare the effects of isolated versus compound weightlifting patterns on core strength in female gym participants. The results revealed a statistically significant difference between the two groups ($p < 0.05$), indicating that the choice of training pattern can meaningfully influence core strength development.

Participants who performed compound movements such as squats, deadlifts, and bench presses demonstrated greater improvements in core strength compared to those engaging in isolated exercises. This supports the idea that multi-joint exercises recruit a wider range of muscles, including deep stabilizers, resulting in superior overall core activation and

strength. [16] Our sample of 186 females, evenly divided between the two patterns, showed that compound training consistently outperformed isolated training across both plank and leg-lowering tests, with the statistical outcomes supporting rejection of the null hypothesis.

Findings from related literature offer both supporting and contrasting perspectives. For example, a randomized clinical trial assessing two different exercise programs, one focused on core-specific movements and another combining core with balance training reported significant improvements in core strength for both interventions, although no significant difference between the two ($p > 0.05$). [16] While this outcome differs from ours, it still underscores the value of targeted core training.

Similarly, EMG-based studies have shown that isolated core exercises can produce higher peak activation in specific muscles such as the rectus abdominis and erector spinae compared to certain integrated movements. [17] These findings suggest that isolation work may be more effective for targeted hypertrophy, whereas integrated, functional patterns are more beneficial for multi-muscle coordination. This distinction helps explain why our results favor compound training for overall core performance, but does not discount the utility of isolated exercises for focused muscle development.

Evidence from strength training research also supports our conclusions. A within-participant comparison of single versus multi-joint lower body resistance training found that multi-joint movements were significantly more effective for strength gains ($p < 0.05$). [18] Likewise, Gottschall et al. reported that compound exercises engaging both proximal (abdominal, lumbar) and distal (deltoid, gluteal) muscles generated greater overall activation than isolation work, with all p-values < 0.05. [19]

Additional studies have highlighted the role of integrating core activation with breathing techniques such as deep breathing during crunches, rotational crunches, leg raises, and planks in further improving performance in plank tests and McGill's torso endurance measures. [20] This suggests that programming variables beyond exercise selection, such as breathing and bracing strategies, can further enhance training outcomes.

From a practical perspective, our findings indicate that compound lifts are more effective for building functional core stability, making them especially relevant for athletes and individuals seeking performance improvements. However, isolated exercises remain valuable for targeting specific weaknesses, aesthetic goals, or rehabilitation purposes. Program design should therefore be guided by the trainee's objectives: compound exercises for functional and sports performance, and isolation work for muscle-specific development or recovery.

In summary, this study contributes to the evidence base favoring compound weightlifting patterns for enhancing core strength in females. By engaging multiple muscle groups and demanding greater stabilizer recruitment, compound lifts appear to provide broader benefits for core stability than isolated exercises. Future research should explore the long-term effects of these patterns, their impact on different populations, and their role when combined within periodized training programs

Conclusion:

Compound weightlifting patterns are associated with significantly greater core strength than isolated patterns in female gym participants. Integrating multi-joint exercises into training programs may yield superior functional benefits and overall stability. Further research should explore the long-term adaptations of these training modalities across diverse populations.

Limitations:

This study employed a cross-sectional design, which limits causal inference. The sample size was relatively small, and core strength assessment relied on a single field test. Future longitudinal studies with

electromyographic analysis could provide deeper insights into muscle activation patterns.

Disclosure /Conflict of interest:

Authors declare no conflict of interest.

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Original Article

Assessing the impact of Psychological Distress on Burnout among nurses: the protective role of Self-Compassion

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Abstract

Objective: The current study aimed to investigate the relationship between psychological distress and burnout and to explore whether self-compassion would moderate the relationship between psychological distress and burnout among nurses

Study Design: A cross-sectional research design was employed.

Place and duration of study: The study was conducted at Private Hospitals of Islamabad and Rawalpindi.

Material and Methods: The study was conducted to examine the relationship between study variables among nurses. The sample consisted of 300 participants, including both male (N=48) and female (N=252), taken from different public and private hospitals in Islamabad and Rawalpindi, through convenience sampling. The age range of the participants were 25 to 45 years. The Depression, Anxiety and Stress Scale-21, Copenhagen Burnout Inventory, and Self-Compassion Scale-Short Form were used to collect data. SPSS Version 25 was applied to analyze and interpret the data in statistical terminology.

Results: The results indicated that regression model is significant and predicted total 26% variance in the outcome (R^2= 0.26, F=107.2, p<0.05). Furthermore, psychological distress was a significant positive predictor of burnout (β= 0.51, p=0.000). It was also found that self-compassion (B= -0.29, p=0.001) acted as a significant moderator in the relationship between psychological distress and burnout of nurses.

Conclusion: Psychological distress and burnout are prevalent among nurses because of their highly stressful profession. The finding has implications for healthcare interventions, may contribute to the growing body of research literature in the field and also suggests avenues for future research.

Keywords: Burnout; Nurses; Psychological Distress; Self-Compassion

1. Introduction

Nurses are frontline healthcare personnel who serve more patients, work longer hours, take part in infection control measures, and treat infected patients directly during emergencies and pandemics. [1,2]. According to the Pakistan Economic Survey 2020-2021, with a population of over 200 million, the total number of registered nurses in Pakistan was 116,659. The Pakistan Nursing Council recommends a nurse-to-patient ratio of 3:10 in the general wards of Pakistani hospitals, however the present ratio is 1: 40. Nurses face a variety of work-related stressors, such as relationships with physicians and other personnel, work volume encompassing tasks outside of direct care, the demands of providing effective quality care, and meeting expectations in their role as nurses.[3] They struggle to handle the responsibilities of their jobs, which can be emotionally strenuous and has been linked to a decline in professional commitment. [4,5] Psychological distress refers to the distinguishing unpleasant psychological state that an individual experiences as a reaction to a specific stressor or circumstance that harms them, either permanently or temporarily [6] (Bhutto et al., 2019). Numerous researchers have demonstrated that psychological distress among nurses is rising as they are continuously confronted with the psychologically exhausting task of providing treatment for patients with chronic illnesses which affects their mental health

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work performance, social relationship, and overall well-being. [7,8,9] In Pakistan, 45% of nurses had psychological distress. [10] According to Huang et al. (2025), positive relationship exists between psychological distress and burnout, with an increase in psychological distress indicating an increase in burnout. Similarly, Hamid and Hee (2024) indicated that psychological stress and social stress have significant positive relationships with emotional exhaustion and depersonalization. [11]

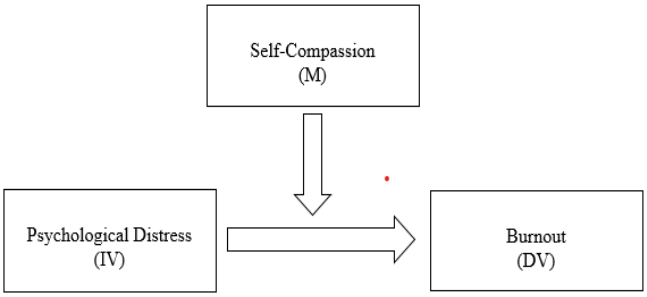
Burnout is one of the most significant psychological occupational hazards defined as a specific kind of long-lasting work-related stress that appears to affect human services workers the most and characterized by emotional tiredness, an absence of energy and an escape from work.[12] Pakistan reported a high burnout rate of 79% linked to the increasing work burden .[13] Furthermore, 48.6% of Pakistani nurses experienced burnout, with 37.2% reporting severe emotional exhaustion, 46.9% stating decreased personal achievement and 36.8% indicating severe depersonalization.[14] Nurses have a heightened vulnerability to burnout due to predisposing factors including work rotations, female gender, placement to highly challenging fields of work (oncology, intensive care unit, etc.), lack of experience and an unstable work environment.[15] Furthermore, numerous structural factors, such as the shortage of nurses, the potential for workplace violence, low pay, low social status, long work hours, and health issues, can be attributed for the high levels of emotional exhaustion among nurses.[16] There is ample evidence in literature that nurses suffering from burnout are more prone to neglect essential elements of patient care like administering medication, communicating, and monitoring.[17] Previous literature has supported the positive relationships between psychological distress and burnout. According to a study by Emilia et al. (2017), a significant portion of nursing employees in a variety of medical settings are at susceptible phase of burnout. Additionally, burnout was found to be significantly predicted by psychological distress.[18] Additionally, those who experience burnout tend to have diminished self-confidence, negative self-perceptions, and a lower sense of work achievement. [19.20] As a result, developing useful coping mechanisms is crucial.

Self-compassion is investigated by Neff (2003) in three dimensions. [21] Self-kindness is the first dimension which is described as accepting oneself and other people's thoughts, feelings, and behaviors without passing judgment. Second dimension is common humanity, which highlights that failures and flaws are a natural part of the human experience because no one is perfect. The third aspect is mindfulness, which entails confronting suffering and unpleasant ideas head-on rather than avoiding or overanalyzing them. Self-compassion is considered as a personal intrinsic resource [22] and nurses can use these resources to help them deal with the emotional demands of their work. [23] Through the integration emotional control and offering efficient coping approaches for stressful situations, self-compassion sustains an individual's good mental health. [23,24] When presented with challenging circumstances, nurses with self-compassion may stay composed and optimistic because they perceive difficulties as normal and avoiding negative thinking. This helps them learn from mistakes and continue providing quality care. [25] Transactional Theory of Stress and Coping by Lazarus and Folkman (1984) provide a valuable explanatory theoretical framework. It explains how people evaluate and react to stress through primary appraisal (determining whether a situation is hazardous) and secondary appraisal (assessing coping resources). Stress in nurses can result in psychological suffering and burnout when coping mechanisms are thought to be inadequate. Self-compassion serves as an effective coping strategy that helps nurses prevent burnout, regulate stress, and lessen distress. Empirical evidence suggests that greater self-compassion was associated with reduced job burnout and stress at work, as well as improved life quality among nurses.[26,27,28] Additionally, literature suggests self-compassion might act as a shield against the adverse effects of depression and burnout. [29] The majority of the researches that is now available is frequently extrapolated from Western context, which could not adequately represent the distinct cultural, social, and economic elements that influence Pakistani nurses. Particularly, in context of

Pakistan, there are limited empirical studies specifically focusing on self-compassion as a protective power in the relationship between psychological distress and burnout among registered nurses. Thus, there is a need for more research exploring the protective factors against negative outcome among Pakistani nurses as it plays a fundamental role in patient safety. To fill the literature gap, the predominant objective of current research was to examine the relationship between psychological distress and burnout among nurses and to explore whether self-compassion may play any role to reduce the effect of psychological distress and subsequently burnout.

The hypotheses formulated were: H1) Psychological distress would positively predict burnout among nurses. H2) Self-compassion would negatively moderate the relationship between psychological distress and burnout among nurses.

Figure 1: Presumed structural connections between psychological distress, self-compassion and burnout



2. Materials & Methods

A cross-sectional research design i.e. correlational research strategy was employed to examine the relationship between study variables among nurses employed in different hospitals of Islamabad and Rawalpindi, Pakistan. This study was conducted from November 2024 to April 2025 at the Department of Psychology, National University of Medical Sciences (NUMS). The sample consists of registered nurses (N=300) including men (N=48) and women (N=252) of age range of 25 to 45 years, currently working in medical/general wards, intensive care units and emergency wards of different departments of hospitals. Sample size was calculated using G power formula (N>50 + 8m; m represents the total number of predictors in the model, So N>50 + 8 x 3 = 75. Convenience sampling technique was applied to collect data from participants. Since this study examine the risk factors, registered Nurses must have had two years of experience working in general wards, emergency wards, and intensive care units of different hospitals were included and nursing students, internees and off-duty nurses were excluded.

The approval was taken from the Institutional review board (IRB) to conduct the study. Permission to use scales was attained by respective authors. Ethical considerations were strictly followed, and the participants provided informed consent. Three standardized measures were administered for the collection of data along with demographic sheet, named as Depression Anxiety Stress Scale (DASS-21) (Lovibond, 1998), Copenhagen Burnout Inventory (Kristensen et al., 2005) and Self-Compassion Scale Short Form (SCS-SF) (Raes et al.,2011), to evaluate the levels of psychological distress, burnout, and self-compassion among nurses. [30,31]

For the statistical analysis, SPSS Statistics 25 version was utilized to evaluate data. Analysis was conducted in a quantitative manner. Descriptive statistics was used to analyze frequencies and percentages of demographic variables of participants (see Table 1). Reliability analysis was run for the psychometric properties (see Table 2). Furthermore, regression analysis was used to assess prediction among study variables (see Table 3). Moderation was done using Process by Hayes (2018) to assess the moderating effect of self-compassion on the association among psychological distress and burnout (see Table 4).

3. Results

Table 1

Descriptive statistics of the sample (N=300)

Characteristics of Participant		*f*	%
Age			
	25 to 30	153	51
	31 to 35	86	28.7
	36 to 40	42	14
	41 to 45	19	6.3
Gender			
	Male	48	16
	Female	252	84
Marital Status			
	Single	124	41.3
	Married	173	57.7
	Divorced	3	1
Employment Status			
	Full Time Employed	258	86
	Part Time Employed	42	14
Work Experience			
	2 to 5 years	152	50.7
	6 to 10 years	98	32.7
	11 to 15 years	26	8.7
	More than 15 years	24	8

Note: F= Frequency, %= Percentage

Table 1 shows the demographic characteristics of participants consists of a data of a total of 300 nurses. The sample consisted of participants of ages 25 to 45 years, where there were 153 participants aged between 25 and 30 years (51%), 86 participants in the age range of 31 to 35 years (28.7%), 42 participants aged between 36 and 40 years (14%) and 19 **participants in age** bracket of 41 to 45 years (6.3%). Based on gender, the number of female participants were greater than male, 252 (84%) and 48 (16%) respectively. When we segregate on the basis of marital status, 124 participants (41.3%) were single, 173 participants (57.7%) were married and only 1% were divorced. 258 participants (86%) were full time employed and 42 participants (14%) were part time employed. Data on work experience was found in five slabs. The first one shows there were a total of 152 (50.7%) participants had work experience of 2 to 5 years. 98 participants (32.7%) had a work experience of 6 to 10 years, 26 participants (8.7%) had a work experience of 11 to 15 years and 24 participants (8%) had a work experience of more than 15 years.

Table 2

Psychometric Properties of the Study Variables/Scales (N=300)

Variables		*k*	*α*	*M*	*SD*	Range		Skewness	Kurtosis
						Potential	Actual		
DASS-21		21	.84	36.34	17.33	0-126	6-90	0.42	-0.67
	DS	7	.61	11.07	6.35	0-42	0-30	0.41	-0.45
	AS	7	.70	12.56	7.49	0-42	0-36	0.52	-0.39
	SS	7	.60	12.72	6.28	0-42	0-30	0.29	-0.53
CBI		19	.89	34.42	16.46	3-100	3.95-81.5	0.51	-0.19
	PB	6	.81	35.64	18.25	0-100	0-91.67	0.53	0.04
	WB	7	.74	38.02	19.57	0-100	3.57-96.4	0.54	-0.05
	CB	6	.74	29.00	17.91	0-100	0-79.17	0.49	-0.36
SCS-SF		12	.73	3.28	0.43	1-5	1.83-4.5	-0.17	0.51

Note: DASS-21 = Depression Anxiety and Stress Scale-21, DS= Depression Subscale, AS= Anxiety Subscale, SS= Stress Subscale, CBI = Copenhagen Burnout Inventory, PB= Personal Burnout, WB= Work Burnout, CB= Client Burnout, SCS-SF = Self-Compassion Scale-Short Form

Table 2 presented the alpha reliability coefficient and descriptive statistics for the study variables. The Cronbach's alpha reliability for the Depression, Anxiety and Stress Scale (DASS-21) is 0.84. For the subscales of DASS-21 have reliability 0.61 (Depression), 0.70 (Anxiety) and 0.60 (Stress) respectively. On the Copenhagen Burnout Inventory (CBI), alpha reliability is found to be 0.89. For subscales of CBI, alpha reliability is 0.81 for personal burnout and 0.74 for the work-related burnout and client-related burnout. Self-Compassion Scale- Short Form (SCS-SF) has a good reliability (0.73). The data is normally distributed as skewness and kurtosis fall within their respective ranges.

Table 3

Linear Regression for Psychological Distress in predicting Burnout (N=300)

Variables	*B*	*SE*	95% CI		*β*	*p*
			LL	*UL*		
Constant	16.67	1.89	12.94	20.41		
PD	0.48	0.04	0.39	0.58	0.51	0.000
R^2					0.26	
F					107.2	0.000

Note: PD= Psychological Distress, R^2= Correlation Square, F= Statistic

Table 3 shows linear regression to find predictor of burnout among nurses. Psychological Distress was entered as a predictor variable. The emerged model of regression proved to be significant, R2 = 0.26, F= 107.2, $p<0.05$. This model predicted total 26% variance in the outcome. Furthermore, Psychological Distress is significant positive predictor of burnout ($\beta = 0.51$, $p<0.000$). It indicates that having psychological distress results in increase in burnout.

Table 4

Moderating effect of Self-Compassion on the relationship between psychological distress and burnout (N=300)

Variables			95% Confidence Interval				
	B	SE	LL	UL	R^2	P	F
					0.34	0.000	50.88
Constant	33.85	0.79	32.28	35.41			
PD	0.41	0.05	0.31	0.49			
SC	-8.72	1.84	-12.35	-5.09			
X*M	-0.29	0.09	-0.47	-0.12			
Interaction					$\Delta R^2 = 0.025$	0.001	11.06

Note: PD = Psychological Distress, SC=Self-Compassion

Table 4 shows moderation analysis was performed using PROCESS by Hayes on study variables. In this model, Self-Compassion acted as moderator which influence the relationship between psychological distress and burnout. The interaction effect shows that the moderation is significant ($p<0.01$) and self-compassion negatively moderated the effect of psychological distress on burnout (B = -0.29). Thus, indicating that higher self-compassion levels weaken the positive relationship between burnout and psychological distress. The overall model added 34% additional variance in burnout ($R^2 = .34$) and including the interaction term results in a substantial gradual change in explained variance ($\Delta R^2 = 0.025$).

Figure 2: Statistical model of moderation process indicating effect of self-compassion on burnout through psychological distress.

4. Discussion

The present study aims to explore how psychological distress affects burnout and to assess the moderating influences of resilience and self-compassion on the connection between psychological distress and burnout among nurses. The findings offer a thorough comprehension of how the study variables relate to one another. The current study's findings are linked to existing literature.

The findings of the current study indicate that psychological distress would positively predict burnout among nurses. These results align with previous research that found psychological distress as a significant positive predictor of burnout.[33] Another research found that nurses' burnout is positively predicted by their anxiety, stress and depression. [34] Similarly, a study by Ren et al. (2023) showed that there was a positive correlation between psychological distress and emotional exhaustion as well as depersonalization, while job satisfaction was negatively correlated with psychological distress. Psychological distress had been found associated with significant effects such as burnout. [35]

This study also highlighted that self-compassion negatively moderates the relationship between psychological distress and burnout among nurses. Previous studies have also confirmed the findings of the present study indicates that self-compassion can aid in preventing burnout. The study by Abdollahi [37] showed that nurses' job burnout is lessened by self-compassion in relation to perceived stress so that nurses with greater self-compassion had lower job burnout rates, while those with higher perceived stress exhibited increased job burnout. Likewise, the moderating effect of self-compassion is also in line with research carried out by [29] showing higher depressed symptoms were reported by those with high burnout and low to moderate self-compassion, indicating that self-compassion moderated this association. In reference to current findings, previous research found that self-compassion results in lower stress levels and acts as a preventive measure against burnout. [38] Moreover,

Aiken, L. H., Sloane, D. M., Bruyneel, L., Van den Heede, K., Sermeus, W., & Rn4cast Consortium. (2013). Nurses' reports of working conditions and hospital quality of care in 12 countries in Europe. International journal of nursing studies, 50(2), 143-153.another study found that self-compassion moderated the association between stressors and psychological consequences. [(39)]

There are limitations to our study that future research should consider. The study's cross-sectional design offers a snapshot of data collected at one specific moment. This limits the generalizability of results and the ability to make causal inferences. Future research should adopt longitudinal designs to track how burnout and psychological distress change over time and how nurses learn to manage it. The findings on gender differences are not explored, because most of the nursing sample was female in this study. Future studies should also include data from male nurse staff. The study used self-reported measures which may produce several biases and have negative impact on the internal validity. There is a need for indigenous scales that are appropriate to our culture for the better understanding and interpretations of items.

Conclusion:

Results suggested that psychological distress is a significant positive predictor of burnout. Psychological distress not only directly impacted burnout but also buffer it through the influence of self-compassion. Thus, self-compassion should be valued as important protective factors for the prevention of psychological distress and burnout and enhancing nurses' quality of life. Overall, this study contributes to the growing body of literature on mental health in the nursing profession.

Disclosure /Conflict of interest:

Authors declare no conflict of interest.

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Original Article

Role Preparedness and Associated Challenges of Principalship in Nursing Academia: An Exploratory Study

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Abstract

Objective: This study aimed to explore the preparedness of principals and vice principals in nursing institutions.
Place and duration of study: This study was conducted at nursing colleges in Islamabad and Rawalpindi that offer undergraduate BSN programs, including both public and private institutions. This study was conducted from March to September 2023.
Material and Methods: An exploratory, descriptive, and qualitative study design was used. Participants were selected using purposive and snowball sampling. Data were collected through face-to-face interviews using a semi-structured interview guide. Content analysis was performed. The study was approved by the ethics and research board.
Results: Twelve interviews were conducted. Nine out of twelve participants were female and three were male. Two were vice principals, and the rest were principals. The analysis of the data brought the findings into five main categories and twenty subcategories. The categories included role preparedness for principalship, challenges related to role preparedness, participants, and recommendations. The subcategories followed each category.
Conclusion: Principals and vice principals performed academic planning and management, capacity building, quality assurance, and program excellence. A few challenges were constraints in planning budgets, financial management, operational hindrances, and resource limitations due to a lack of educational management knowledge and experience.

Keywords: Nursing, Institute/College, Principal, Role Preparedness, Challenges, MSN

1. Introduction

In developing countries, principalship is often limited to administrative duties within centralized education systems, offering little autonomy. Principals typically emphasize routine management, adopt autocratic leadership styles, resist change, and provide limited instructions. [(1)] Over the past 30 years, there has been extensive discussion on the importance of higher education for nurses. [(2)] The dynamic nature of the healthcare delivery system emphasizes the importance of the nursing profession to look forward. The purpose was to forecast the healthcare demands that nurses are required to meet. [(3,4)] Nurses' education is influenced by various factors, such as disease and revolutions. [(2,4)] The future of nursing requires further training and education to fulfill the increasing demand for healthcare. [(4)] (4) Several preparational methods have been introduced for master's and doctoral programs owing to the evolution of nursing education. [(2)] Consequently, rethinking and strengthening nursing as a practice discipline integrates theoretical and practical knowledge. [(5)] Master's programs in nursing have evolved from general degrees to specialized tracks, allowing students to focus on areas such as administration, education, clinical management, or advanced practice to prepare for senior roles. [(6)] A Master of Nursing degree equips nurses with advanced clinical skills and scientific knowledge to meet individual and family health needs and enhance healthcare quality. [(7,8)] The Pakistan Nursing Council (PNC) has emphasized that only nurses should lead nursing schools, with the latest directive issued in 2017.However many institutions have failed to meet this requirement. Nurses now hold advanced practice and emotional administrative and senior management

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roles in hospitals and academic settings. [9]

Moreover, it is important to examine the role of principals in ensuring the desired outcomes of nursing education. [6] Most programs focus on leadership- and evidence-based competencies. Whether competencies attained during postgraduate training are utilized in the practice environment needs to be well researched. [8,10] Nevertheless, the phenomenon of principalship is yet to be well studied in the national and international contexts of the nursing domain. Consequently, it is necessary to clearly state the principal capabilities required to create a basis for the nursing education curriculum. [6,7] In nursing higher education, the core outcome is anticipated to maintain leadership management capabilities in academic and clinical settings. [11-13]

In Pakistan, the shift from diploma to degree programs has heightened the emphasis on higher education in nursing. PNC and HEC now require an MSN degree for principal roles in nursing colleges, prompting more nurses to pursue advanced education. This rising demand for principalship and vice-principalship presents challenges, leaving many feelings unprepared for the transformation. According to the researcher, some colleges appoint newly qualified or experienced nurses with higher education, whereas others have principals lacking advanced nursing degrees. Effective Principalship demands specific competencies. Motivated by limited research on principalship in nursing education, especially within academic settings, this study aimed to explore the role performance of principals and vice principals in undergraduate nursing institutes. Most existing studies have focused on clinical or international contexts, highlighting a gap in local academic research

2. Materials & Methods

This study used an exploratory, qualitative descriptive design to examine principalship in nursing. This approach efficiently captured the participants' views for a contextual understanding of the phenomena. [14] To gain in-depth insight into these phenomena, an exploratory qualitative descriptive design is ideal. [15] Thus, the chosen design explored the feelings of principals and vice-principals about their role preparedness.

Study Setting and Duration

This study was conducted at nursing colleges in Islamabad and Rawalpindi that offer undergraduate BSN programs, including both public and private institutions. This study was conducted from March to September 2023.

Study Population

The target population for this study consisted of principals and vice principals who had been serving as principals for at least three months at nursing colleges in Islamabad and Rawalpindi.

Sampling Method

A snowball sampling strategy was used for data collection. In qualitative research, purposeful sampling is widely employed to identify and select information-rich examples related to a phenomenon of interest. [15] Purposive Sampling is the most suitable and appropriate data collection strategy for a qualitative descriptive exploratory study design that examines specific key issues related to the phenomena. [16] Snowball sampling was used when some participants referred others for the study. This method involves asking participants to recommend additional individuals for sampling, which often occurs after the study has begun. [14] Therefore, the aforementioned sampling strategies were used in this study.

Inclusion and Exclusion Criteria

Participants were considered eligible for inclusion in the study if they had a minimum of three months of professional work experience and were formally appointed to the position of Principal or Vice Principal. Individuals occupying temporary, interim, or acting roles were excluded to ensure that the captured perspectives reflected the experiences of those in substantive leadership positions.

The sample size was not predetermined, but was based on data saturation, meaning that it depended on whether the information began to repeat during the interviews. The interviews were conducted until data saturation was achieved. The sample size was not predetermined or fixed but was based on the information provided by participants to meet the study's objectives. [17]

Recruitment Process

After receiving ethical approval, the researcher visited nursing colleges in Islamabad and Rawalpindi to recruit eligible participants. Information about the study was shared through meetings, calls, and email. Once consent was obtained, interviews were scheduled. Snowball sampling was used to recruit additional principals and vice principals from other institutions.

Mock Interview

Before data collection, a pilot interview was conducted to test the research instrument. This mock interview allowed the researchers to adjust the instrument based on feedback from a small sample of participants. [17] The interview guide was revised to include questions about the challenges of principalship related to role preparedness.

Data Collection

Data collection was performed using a semi-structured interview guide that allowed the study participants to reflect and share their feelings openly with the research. The semi-structured interviews were in-depth interviews in which respondents reacted to predetermined open-ended questions; as a result, many healthcare professionals used semi-structured interviews in their studies. [14] Situational or unplanned probing was performed for the convenience of the study population, which needs more clarity or elaboration on the issue. The interview guide was developed in English. Furthermore, the demographic data were taken in a demographic form. The researcher conducted face-to-face interviews in a comfortable and convenient room at the nursing colleges, ensuring confidentiality throughout the process. With the participants' permission, the interviews were recorded in English, lasting about 40-45 minutes. Probing techniques were used as needed, and written notes on participants' facial expressions and nonverbal cues were also taken.

Data Analysis

Data were analyzed manually through content analysis by following qualitative analysis steps. [14] Content analysis, a research technique, identifies specific words, topics, or concepts in qualitative data. The recordings and transcriptions of each interview were stored separately. Responses were read multiple times and coded after translation. Data were repeatedly reviewed to understand hidden meanings, with similar codes grouped into subcategories and main categories. The process was confirmed by the supervisor and committee members.

Study Rigor

Lincoln and Guba's framework of trustworthiness was applied to ensure the rigor of this study. [18] Credibility, Written consent, and unplanned probing clarified questions and enhanced understanding of participants' responses. To ensure credibility, peer debriefing included regular sessions with the participants, the research supervisor, and the co-supervisor. Transferability: Thick descriptions involved detailing categories and subcategories with direct quotes from participants. The study results were verified and validated through the research process. Dependability and Confirmability, Data consistency was maintained over time. Dependability was ensured by the researcher through repeated reviews of audiotapes and transcripts. Confirmability was achieved by thoroughly checking accuracy. Authenticity: Categories were illustrated with direct quotes to convey the perceptions of principals and vice principals

3. Results

Participant's Demographic Characteristics

The study included 12 participants (n=9 females, n=3 males), mostly from private institutions (n = 10). Ten were principals, and n=11 held an MSN degree, with

eight having an education-focused background. Five also had an additional Master's degree (MSPH, MAS, or MHR). Most had over five years of teaching experience, less than five years of clinical experience, and less than five years of experience as principals.

Table 1: Demographic Characteristics of Principals (n=12)

Participants	Gender	Qualification	Experience (Years)	Institute Type
1	Female	MSN-E	04	Public
2	Female	MSN-E	1.5	Private
3	Male	MSN-E	03	Private
4	Female	MSN-E	02	Private
5	Male	MSN-C	04	Private
6	Male	MSN-C	1.5	Private
7	Female	MSN-E	03	Private
8	Female	MSN-C	01	Private
9	Female	PRN-BSN	04	Public
10	Female	MSN-E	01	Private
11	Female	MSN-E	01	Private
12	Female	MSN-E	1.5	Private

Categories and Subcategories

The data analysis was organized into three categories and eleven subcategories, as summarized in Table 2. These categories and subcategories are detailed in the following section, with excerpts and direct quotes from the participants. To improve readability and clarity, minor grammatical corrections were made to the quotes without altering their meanings.

Table 2: List of Categories and Subcategories

Categories	Subcategories
Role Preparedness for Principalship	• Preparation Through Higher Education • Synergy of Experience and Education • Preparation Through Peer Collaboration and Mentorship • Knowledge Acquisition with Experience
Challenges Related to the Role Preparedness	• Lack of Educational Management Knowledge • Curriculum Versus Practical Reality • Lack of Training • Lack of Experience
Participants' Recommendations	• Hiring Criteria and Eligibility • Training and Preparation • Required Soft Skills

Role Preparedness for Principalship

This category emerged from findings on principal role preparation, including higher education, combining experience and education, peer collaboration and mentorship, and knowledge gained through experience.

Preparation through Higher Education

Higher education is crucial for principalship, with most principals and vice principals emphasizing the importance of master's degrees such as MSN, MSPH, and MAS. A principal mentioned, "I did my MSN to groom myself in the academic institute for professional development and the things which I felt were causing the problem, I was able to find out the solution for that just because of my MSN" (5P) Likewise, another principal expressed "My Master's education makes me more capable, wiser, and more confident in my decision, I learned how to be focusing outcome-based education because of the curriculum development course in my masters" (2VP).

Many principals stated that certain MSN courses, like those in leadership and management, curriculum design, educational practicum, and critical thinking, equipped them well for the role of principal. Such as a principal discussed that, "After getting the leadership management and curriculum alignment courses in education of MSN, I am prepared for all the leadership qualities, the type of learner, teaching-learning strategies, and assessment planning, and these all things strengthen my performance being a role principal' (1P). Likewise, a vice principal expressed, "I acquired knowledge from particularly leadership and management, curriculum designing which helped me for my professional development" (3VP).

Similarly, another principals affirmed that, "I learned from curriculum designing about advanced teaching learning strategies and I tried them to incorporate into my teaching such as problem-based learning, case-based learning, and critical thinking I observed that when you teach your students from books and giving them traditional lectures, it is wastage" (2VP).

A few principals emphasized the significance of the education practicum course taken during their MSN studies, as highlighted by the principal. "I learned a lot of things in the education practicum subject, either it is in clinical or in education" (4P) Likewise, the principal elaborated "In MSN we learned through clinical education course was offered us and the expectation was to conduct seminars and workshop" (7P).

Some principals have discussed the value of the critical thinking course and how it aids them in applying it across various clinical settings. A principal stated, "the critical thinking course helped me that how to apply critical thinking in certain difficult situations as well as developed my communication skills during my role" (4P). Similarly, another principal affirmed "The course Critical Thinking which help me in a way that when whenever the situation come how you handle that situation and being an outbox thinker not limited" (10P).

Some principals highlighted the significance of the nursing theories course, which deepened their understanding of the application of theories to achieve better outcomes. A principal stated, "The knowledge of the nursing theories enhances my knowledge about clinical practices and regarding patient care" (1P). However, another principal elaborated "I have acquired knowledge through the nursing theories which directly aligned my role as a principal" (4P).

Synergy of Experience and Education

This subcategory highlighted the importance of relevant teaching and clinical experience, along with the education needed for principalship. Many principals shared their views on the value of teaching and clinical expertise. A principal stated, "Education is mandatory, but experience also matters a lot to become a principal, and I would say both are important because with experience you learn how to solve the problem, and your decision making and problem-solving are based on experience. But with the education, I was able to make appropriate decisions, with critical thinking and farsightedness" (1P).

Likewise, the other principal expressed that, "It is very important for a good leader to having clinical and educational experience both because without clinical experience how would I help my students to learn their clinical expertise, both things are very important to have some experience in clinicaland then in academics" (7P). Few principals elaborated the importance of the professional development "I believe that experience counts but an up gradation of the knowledge through the professional development is very much in having these managerial leadership roles" (6P).

One vice principal discussed that she could apply her knowledge learned from vast experience "I do not have any hesitation and sort of problem, any adjustment issues within this position because of previous vast experience of an educator and clinical nurse to ensure my capabilities and to ensure my efficiencies" (2VP). Similarly, a principal agreed "I am applying my

knowledge in this position either got from my educational career or from my previous clinical experiences" (4P).

Preparation through Peer Collaboration and Mentorship

Most principals shared their insights into how collaboration, peer engagement, and mentor support contributed to their preparation. A vice principal expressed "I learned from my seniors, how to solve that problem by our expert management So, I used to refer that problem to our senior management and I resolve that problem similarly in that way" (2VP). Likewise, a principal stated, "It was very good experience for me under the supervision of my senior I learnt a lot of the things because she was giving me a free hand to manage clinical management and academic management" (8P). Similarly, another principal shared "I had learned with the help of my colleagues on budgeting, roaster making for clinical rotations which based on based teaching experience and skills" (6P).

Preceptorship model is the part of learning to maximize learning, as one principal pointed out "I have learnt a lot from my preceptor like how to supervise students and giving them assignment, checking of the assignments" (12P) similarly, other principal affirmed "I learned from my preceptors at different positions like senior lecturer, clinical instructor, what was their primary role" (11P).

Knowledge Acquisition with Experience

Most principals shared that they gained valuable knowledge for their role as principals through their day-to-day experiences. One principal stated, "I can handle easily the whole college by getting the experience day by day with management" (5P) Likewise, other vice principal expressed "I experienced day-to-day experiences like, managing the students, coordinating with the different teachers, and dealing with the junior staff, admin staff" (3VP).

A few principals emphasized the importance of practical experience and viewed it positively. A principal stated "MSN qualification is not enough for this role because when you come on the reality there are a lot of things where you know the degree is not sufficient and you learn from your challenges"(8P) Similarly, another principal affirmed "I have few challenges day to day like workload management, staff retention, the education content management, faculty and students' attendance, Internet-related issues but they are healthy to me, I took them positively because they developed me professionally" (7P).

Challenges Related to the Role Preparedness

This category arose from several challenges related to role preparedness encountered by various principals, including a lack of educational management knowledge, curriculum deficiencies, insufficient training, and limited experience.

Lack of Educational Management Knowledge

Some principals discussed that they did not know about the management of an academic institute, as one principal stated "I faced challenge because organization expected from me to fulfil all the basic requirements of inspection from Pakistan Nursing College but I can't do because I don't know the process of inspection" (8P) Likewise, other principal "We didn't have a proper session in MSN on how to do the inspection process for an institute and how the institute will grow" (6P).

Knowledge of academic management is essential for running an institute; some principals shared challenges related to having limited knowledge of educational management. As a principal pointed out; "I completed my MSN in the clinical track, so initially, it was challenging for me because this role is entirely focused on the educational track. My background was in the clinical track with experience solely in hospital settings, so the transition to this domain was quite different" (8P). Likewise, another principal affirmed "I had knowledge about the education side only when I was doing master's education otherwise, I don't have any teaching experience, and I know the less practical experience can affect your practice" (6P).

Curriculum versus Practical Reality

Few principals identified deficiencies in the MSN curriculum, which is why they think that they cannot help them perform their role as principals. One principal expressed "There is lot of deficiencies in curriculum designing course because I took the guidance from the other seniors that how they are running their institutes" (5P) Likewise, other principal stated "I felt that this leadership and management subject was related to clinical side scenario because most of the scenarios were from the clinical side rather than from educational side" (12P). Similarly, a vice principal affirmed "We have not studied anywhere that what is teaching workload, national guidelines for how many credits to assign the faculty, what are the policies of different institutions, and similarly budgeting, negotiation skills, stress management skills" (3VP).

Lack of Training

Principalship training and workshops play a significant role in preparing novice principals. As principal mentioned "There is lot of deficiencies in MSN, there must be some additional workshops or training for those who are graduated with the clinical track to get the flavour of educational track" (5P) Likewise, another principal elaborated "Master of Science in nursing prepares nurses to deliver the role as nurse educator but not the administrative is not much strong" (11P).

Lack of Experience

Some newly graduate principals shared about their lack of the practical experiences which put them trouble to resolve the issue such as a principal, "I am not competent as I am fresh graduate, I do not know certain things so being honest with myself and being open to learn the things because I joined this position based on my qualification otherwise my experience is not that much" (8P). Likewise, another principal stated, "I worked mostly in critical areas such as surgical ICUs and medical ICUs, so my main experience in the critical care and after that directly appointed as principal of this institute" (5P). Similarly, other principal affirmed "I wouldn't deny the importance of experience because I have no prior educational institute experience, and I realized that thing after joining this position" (6P).

Participants' Recommendations

This category emerged from the principals' recommendations, which included hiring criteria and eligibility, training and preparation, and necessary soft skills.

Hiring Criteria and Eligibility

A few principals expressed some recommendations for hiring and eligibility criteria for principals such as a vice principal stated "There must be you know written clear guidance from the Pakistan nursing council to avoid the upcoming of new and fresh principals who are ruling the institution without experience without an educational qualification"(2VP) Likewise, another principal discussed "There should be defined criteria for the role of principal, both experience and qualification should be considered for hiring a principal and this should be strictly implemented in the institute"(12P). Similarly, another principal affirmed "One should follow steps such as lecturer, senior lecturer, assistant professor can be suitable for the role of principal" (8P).

Training and Preparation

Some principals suggest training programs for the preparation of the role of principals. According to the principal, "There should be some preparatory classes even for government nurses to take charge of Principalship" (9P). Likewise, another principal shared "I suggest my regulatory body arrange training for principals. It should be based on a few weeks" (12P). Similarly, another principal affirmed "when you are that (Principalship) position you really need trainings, I would say it's not a cup of tea to take a charge of principal and we are performing like a champion" (10P).

Some of the recommendations were specifically for novice leadership roles. A principal expressed "A workshop or training sessions can be arranged specifically and purposefully aligned or designed in a

way that addresses the challenges of for those who are interested and new in the role of principal as for as administrative" (11P) Likewise, other principal specified "For the novice nurses should add some preparedness courses or workshops which specifically talking about the role of principal and administrative position" (4P).

A few recommendations from principals suggested designing or modifying certain courses to better prepare individuals for the role of principal. A principal explained "To strengthening the leadership role only the course is not enough I would really suggest that there should be a track for the leadership in the nursing" (10P). Similarly, another principal affirmed, "I think in the leadership and management course there should be a topic for the academician higher positions to managing the entire situation, institutional affiliation, rules and regulations and the hierarchy" (4P).

Required Soft Skills

Some of the principals shared some required significance soft skills for the role of Principalship, such as a vice principal expressed "A principal must have the confidence to take initiative for students learning, teaching responsibilities, and organizational responsibilities" (2VP). Another principal stated, "The principal should be enough competent for their curriculum and course management ethical, professional, and personal management as well" (6P). Similarly, another principal affirmed "I experienced the political influence in my role as a principal, so principal must have the problem-solving, communication skills, conflict management skills and political awareness to deal with all these things" (4P).

4. Discussion

This study aimed to explore the preparedness of principals in nursing institutions in Rawalpindi and Islamabad. The study identified three main categories and 11 subcategories: principals' role preparedness, challenges related to role preparedness, and participants' recommendations.

The study participants included nine females and three males. Of the 12 participants, 11 held a Master of Science in Nursing (MSN), while one principal had a Master in Health Research. Nine principals graduated with an MSN in education, and three with an MSN in clinical practice. In terms of teaching experience, four principals had 6-months to three years of experience, while the rest had over five years. Regarding clinical experience, seven principals had one to three years, and the others had more than five years. For Principalship experience, seven principals had one to two years, and five had three to four years.

The demographic findings reveal that some principals have less than three years of teaching experience, which does not meet the PNC criteria, underscoring the urgent need for highly qualified faculty in nursing academia. Consequently, even with less experience, MSN prepared nurses are accepted for the Principalship. Key features include clinical MSN track principals, who are expected to work in clinical leadership roles, compared to those with MSN in education. However, three principals had an MSN in the clinical track and one principal held a master's degree in health research. It is assumed that a principal with an MSN degree in the education track would be well prepared for the role of Principal. The main goal of the clinical track in MSN is to prepare leadership for clinical nursing management. Perhaps, there are more opportunities in nursing education than in clinical practice. Furthermore, it is also presumed that the possible cause of the current study's findings could be high-salary packages, other benefits, and incentives that directly help them to strengthen financially. Three of the principals have overall less experience, including principalship. They perform their role as novice principals, which leads to less self-satisfaction for role preparedness as well as performance that is congruent with. [19] (

With regard to principalship preparation, most of the principals indicated that MSN prepared them to perform the principalship role, which is congruent with existing studies. [7,20] Few of them highlighted knowledge gained through specific MSN courses like education practicum, curriculum design and

administration, nursing theories, leadership and management, teaching for critical thinking, and academic writing, which are in line with current studies. [7,11] The findings are congruent with a previous study [11] that MSN makes them more capable, wiser, and confident about their decisions in performing leadership roles. The study also revealed findings that aligned with existing studies in which MSN courses improved their skills such as communication skills, writing skills, and problem-solving. These skills helped them apply knowledge to their practice and fulfil their roles. [10,11]

Additionally, most principals noted that the combination of education and relevant experience helped prepare them for the role of principal, which aligns with the study's findings. [4,7,10,11,20,21] In contrast, a few principals identified that MSN education cannot teach how to perform the role of a principal. Occasionally, they require assistance from their seniors and peers. They gained knowledge through day-to-day encounters and difficulties in their current position. These results cannot be supported by previously published literature and contradict the findings. [6,10,11] It is assumed that the context-related problems, which may be the MSN graduates taught in MSN, are the cause of this incongruity since they prevent them from applying their newly gained knowledge to their practices in Pakistan. Furthermore, few principals are employed as principals who are MSN graduates but have a clinical track, which is most suitable for clinical leadership positions.

A few distinct challenges related to principals' preparation were identified by principals and vice principals, including a lack of educational management knowledge, insufficient experience, and some deficiencies in the MSN curriculum. They affirmed that they did not have sufficient knowledge of the educational management of academic institutes. These findings are not consistent with the available literature. It is considered that this could be due to the contextual issue; in Pakistan, newly established nursing institutes have existed for BSN where newly MSN graduates are employed as a principal with less clinical and educational experience. Furthermore, it also assumed that the area of specialty or perhaps less educational institutional working experience is the root cause. If this is not addressed in time, this could lead to compromised educational leadership competencies for upcoming principals.

The study findings also included recommendations from principals and vice principals, such as establishing specific hiring criteria for principalship appointments, with a preference for MSN graduates specializing in education. Few principals suggest that this should be followed by a career ladder for hiring principals, such as relevant qualifications that is MSN with education track and enriched educational experience. Some principals recommend organizing specialized training or workshops to better prepare individuals for principalship. This demonstrates the multifaceted nature of leadership roles and the diverse range of soft skills required to effectively lead educational institutions. Required competencies such as professional expertise in terms of problem-solving, communication skills, conflict management skills, and research expertise to handle organizational responsibilities. [22]

Conclusion:

The findings revealed that while most principals felt prepared through their MSN education, some faced challenges due to lack of educational management knowledge and curriculum deficiencies. Recommendations include revising hiring criteria, developing a Principalship practice scope, establishing an educational career structure, and offering enrichment programs. The study highlights the need for further research to address contextual challenges and improve Principalship preparation in nursing education

Limitations

This study, conducted in Rawalpindi and Islamabad nursing institutes with MSN graduates from both educational and clinical tracks, may not reflect the conditions in other parts of the country, so the findings

should be interpreted cautiously. The study's limitations include a lack of relevant literature on principalship in nursing, but its strength lies in contributing to this knowledge gap and ensuring trustworthiness. The study's findings, applicable to both the public and private sectors, suggest the need for further research in other settings to explore principalship challenges in nursing.

Future Recommendations

Disclosure /Conflict of interest:

Authors declare no conflict of interest.

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