

BEHIND THE MASK: UNVEILING THE MENTAL HEALTH CHALLENGES OF OPERATION THEATRE PROFESSIONALS, A MULTICENTER STUDY OF DISTRICT SWAT PAKISTAN

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ABSTRACT

Background: Operating theatre professionals play a crucial role in healthcare delivery but face significant mental health challenges including anxiety, depression and burnout, owing to their high stress environment. These issues remain underexplored in resource constrained rural settings such as District Swat, Pakistan, where healthcare infrastructure is limited.

Objectives: This study assessed the prevalence and severity of mental health challenges among OT professionals in District Swat and evaluated their impact on wellbeing using the WHO-5 Well Being Index.

Materials and Methods: A cross sectional study was conducted among 269 OT professionals including anesthetists, surgeons, surgical technicians and OT nurses working in government and private hospitals in the Swat district. Validated instruments namely the Hospital Anxiety and Depression Scale (HADS), Maslach Burnout Inventory Human Services Survey (MBI HSS) and WHO-5 Well Being Index were used for data collection. Statistical analyses were performed using SPSS version 22 IBM.

Results: Mental health problems were significantly associated with workplace condition. Private hospital staff showed higher anxiety (mild 70.4%, moderate 86.4%) and depression (mild 67.1%, moderate 81.5%) than government hospital staff. Anesthesiologists, OT nurses and surgical technicians showed the highest burnout levels. Demographics were not associated with mental health outcomes. Poor mental health was correlated with lower well Being and normal anxiety/depression levels showed high WHO-5 scores, whereas moderate levels reduced well Being. Burnout features emotional exhaustion, depersonalization and diminished accomplishments.

Conclusion: Work related stress from hospital type and job duties is a key contributor to mental health problems among OT professionals in the District Swat. These challenges affect their well Being, requiring interventions such as stress management training and workload optimization. Addressing these issues is vital for improving healthcare worker resilience and patient outcomes in the future.

Keywords: operation theatre professionals, anxiety, depression, burnout, workplace stressors, wellbeing.

INTRODUCTION

Operating theatre (OT) professionals including surgeons, anesthesiologists, surgical technicians and nurses play an essential role in healthcare delivery by providing critical services within highly demanding and stressful environments. Globally, these professionals encounter numerous occupational stressors such as extended working hours, inadequate sleep, fatigue, burnout, complex tasks, continuous vigilance, unpredictable outcomes, adverse events, fear of litigation, workplace violence and pressures related to competence and productivity (1). These stressors can impair job performance, compromise patient safety, reduce job satisfaction and increase turnover rates.

Mental health challenges among OT professionals are associated with significant consequences including depression, anxiety, strained interpersonal relationships, substance abuse, marital dysfunction, premature aging, suicide, impaired decision making, decreased efficiency, medical errors, adverse patient outcomes, hostility toward patients, disengagement and early retirement (1). Beyond demographic factors such as age and marital status, emotional suppression and feelings of being unrewarded have also been identified as risk factors for depression, anxiety and stress (2). The high pressure environment of emergency and elective surgeries, characterized by long working hours, sleep deprivation, frequent emergency calls and life or death, decision making contributes substantially to burnout among surgical staff (3). Burnout negatively impacts both healthcare workers and patient care resulting in inadequate treatment and increased medical errors (4). Persistent stress in hostile work environments elevates the risk of psychosomatic disorders, anxiety, depression and burnout particularly among surgical nurses facing increased workloads, resource shortages and emotional strain (5)

Healthcare workers worldwide have struggled under immense pressure to manage patient surges

while experiencing exhaustion and emotional distress. Workload management challenges and professional conflicts have been identified as key stressors for nurses (6). Understanding the prevalence and determinants of physician burnout, distress and depression is crucial for developing effective preventive and intervention strategies (7) In Pakistan, poor public awareness and low adherence to safety measures contribute to high stress, anxiety and depression rates among OT professionals (8). Urban centers such as Karachi, report high burnout rates among physicians, exacerbated by workplace violence and mental health challenges, especially in emergency departments (9). Resource constraints, including shortages of essential medications and critical equipment, further compound the psychological burden on healthcare professionals striving to provide life saving care. In resource limited and rural settings such as District Swat, OT professionals face intensified mental health challenges due to long working hours, insufficient support and heavy patient workloads. Despite the critical role of OT professionals in healthcare delivery, there is a limited understanding of their specific mental health challenges in Pakistan, particularly in rural regions such as District Swat. While prior studies have documented significant mental health issues among healthcare workers in major Pakistani cities (8) focused research on smaller cities and remote areas are scarce. OT professionals in these settings often face resource limitations and have restricted access to mental health support. This study aims to address this gap by evaluating the mental health challenges faced by OT professionals in the District Swat.

In resource limited settings such as Swat, which are characterized by predominantly rural populations and constrained healthcare infrastructure, OT professionals face intense workloads with minimal support. This study sought to identify specific stressors contributing to mental health issues among OT professionals in Swat, Pakistan. The findings will enrich the

global occupational mental health literature and inform tailored policies, interventions and support systems. Addressing these challenges will foster a resilient and productive workforce essential for maintaining high standards of patient care.

MATERIALS AND METHODS

This cross sectional study was conducted from July to December 2024 across various tehsils in the district of Swat, KPK to assess the mental health challenges among operation theatre (OT) professionals. The study included surgeons, anesthesia providers, surgical technicians and OT nurses from government and private hospitals with OT facilities including Saidu, Matta, Kabal, Khwazakhela, Madyan and Mingora. Due to the limited availability of surgeons, most data were collected from anesthesia and surgical technicians. A simple random sampling method was employed to ensure equal selection probability among eligible OT professionals, minimize bias and enhance representativeness. A complete list of eligible professionals was obtained from the hospital administration. The population size was approximately 1615 OT professionals. The sample size was calculated using Cochran's formula based on the highest reported prevalence of anxiety (30%) with a 95% confidence level and 5% margin of error. The initial sample size was 323 which was adjusted to 269 after applying the finite population correction. The inclusion criteria comprised currently employed OT professionals (anesthesia providers, surgeons, surgical technicians, OT nurses) who were government recognized or certified, had at least six months of OT experience and were willing to participate with informed consent. The exclusion criteria included professionals with pre existing diagnosed mental health conditions, those addicted to tobacco or alcohol, students or trainees without recognized professional status and those unwilling or unavailable during the study period (e.g. on leave).

Ethical approval was obtained from the KMU IHS Swat Ethical Review Board and permission was secured from the hospital authorities. Data collection tools including structured

questionnaires and standardized mental health scales, were developed and validated. The demographic data collected comprised 11 items such as name, age, hospital, gender, marital status, job role, education, OT experience, salary and working hours. Mental health assessments included the Hospital Anxiety and Depression Scale (HADS-14), which contains 14 items scored on a 4 point Likert scale to categorize anxiety and depression severity, the Maslach Burnout Inventory Human Services Scale (MBI HSS-22) which assesses Emotional Exhaustion, Personal Accomplishment and Depersonalization subscales to evaluate burnout risk and the WHO-5 Well Being Index, a 5 item scale measuring psychological wellbeing scored on a 0-100 scale. The participants were briefed on the study objectives and provided informed consent. Confidentiality was maintained through the assignment of unique identifiers, secure data storage with restricted access and regular backups. Upon completion, the participants received a summary of the study findings as a token of appreciation.

Data obtained from the HADS-14, MBI HSS-22 and WHO-5 were scored and interpreted. Descriptive statistics were used to summarize the sociodemographic variables. All data were anonymized and analyzed independently using SPSS version 22. Inferential statistics, including chi square tests, were used to assess the associations between variables and mental health scales.

RESULTS

A total of 269 Operating Theatre (OT) professionals participated with a mean age of 29.5 ± 7.9 years, mean monthly income of $58,082.9 \pm 47,306.2$ PKR and average work experience of 6.7 ± 6.3 years. The sample comprised 91.8% males and 8.2% females, 53.5% were married and 46.5% were unmarried. Most of the participants worked in private hospitals (63.6%) and 36.4% worked in government hospitals. Occupationally, anesthesia providers accounted for 48.0%, surgical technicians for 34.9%, surgeons for 10.8% and OT nurses for 6.3%. The educational qualifications included diplomas (67.3%),

bachelor's degrees (20.4%) and advanced degrees (12.3%), (Table 1).

Anxiety levels were significantly associated with hospital type ($P = 0.000$) and job role ($P = 0.041$) with severe anxiety predominantly among government hospital staff (75%) and exclusively among anesthesia providers. Mild and moderate anxiety were more frequent among private hospital employees. No significant associations were found between gender, marital status and education (Table 2).

Depression was significantly associated with hospital type ($P = 0.002$) and job role ($P = 0.008$). Private hospital staff exhibited higher rates of mild (67.1%), moderate (81.5%) and severe (100%) depression. OT nurses and surgical technicians had the highest rates of moderate and severe depression, respectively. Gender, marital status and education were not significantly related (Table 3).

Burnout components revealed that Emotional exhaustion was significantly correlated with marital status ($P = 0.012$) and hospital type ($P = 0.000$) being higher among unmarried participants and private hospital staff (Table 4).

Personal accomplishment was significantly associated with hospital type ($P = 0.000$), job role ($P = 0.023$) and education ($P = 0.001$), with higher accomplishments reported among private hospital employees and anesthesia providers (Table 5). Depersonalization was significantly linked to marital status ($P = 0.000$), hospital type ($P = 0.002$), job role ($P = 0.002$) and education ($P = 0.028$) with higher levels among unmarried staff, private hospital employees and anesthesia providers than their counterparts (Table 6).

Anxiety and depression levels were inversely correlated with wellbeing, as measured by the WHO-5 Index ($P = 0.000$ and $P = 0.003$, respectively). Emotional exhaustion showed a borderline negative association with wellbeing ($P = 0.058$). Personal accomplishment was significantly associated with wellbeing ($P = 0.001$), with a complex pattern wherein some participants with high accomplishments also reported poor wellbeing. Depersonalization was not significantly associated with wellbeing ($P = 0.149$), although higher depersonalization tended to coincide with poorer wellbeing (Table 7).

Table 1: Frequency Table of Categorical Variables.

Variables		Frequency (%)
Gender of participants	Male	247(91.8%)
	Female	22(8.2%)
Marital Status of participants	Married	144(53.5%)
	Unmarried	125(46.5%)
Type of Hospital	Private	171(63.6%)
	Government	98(36.4%)
Job Role of participants	Anesthesia provider	129(48.0%)
	Surgical technician	94(34.9%)
	Surgeon	29(10.8%)
	OT nurse	17(6.3%)
Educational Level of participants	Diploma	181(67.3%)
	Bachelor degree	55(20.4%)
	MBBS/Masters/MD	33(12.3%)

Table 2: Level of Anxiety.

Variables		Level of Anxiety				P-Value
		Normal	Mild	Moderate	Severe	
Gender of participants	Male	122(90.4%)	67(94.4%)	54(91.5%)	4(100.0%)	0.716
	Female	13(9.6%)	4(5.6%)	5(8.5%)	0	
Marital Status of participants	Married	79(58.5%)	38(53.5%)	24(40.7%)	3(75.0%)	0.111
	Unmarried	56(41.5%)	33(46.5%)	35(59.3%)	1(25%)	
Type of Hospital	Private	69(51.1%)	50(70.4%)	51(86.4%)	1(25.0%)	0.000
	Government	66(48.9%)	21(29.6%)	8(13.6%)	3(75.0%)	
Job Role of participants	Anesthesia provider	62(45.9%)	38(53.5%)	25(42.4%)	4(100.0%)	0.041
	Surgical technician	48(35.6%)	26(36.6%)	20(33.9%)	0	
	Surgeon	19(14.1%)	5(7.0%)	5(8.5%)	0	
	OT nurse	6(4.4%)	2(2.8%)	9(15.3%)	0	
Educational Level of participants	Diploma	89(65.9%)	50(70.4%)	39(66.1%)	3(75.0%)	0.309
	Bachelor degree	23(17.0%)	16(22.5%)	15(25.4%)	1(25.0%)	
	MBBS/Masters/MD	23(17.0%)	5(7.0%)	5(8.5%)	0	

Table 3: Level of Depression.

Variable		Level of Depression				P-Value
		Normal	Mild	Moderate	Severe	
Gender of participants	Male	120(91.6%)	77(93.9%)	48(88.9%)	2(100%)	0.734
	Female	11(8.4%)	5(6.1%)	6(11.1%)	0	
Marital Status of participants	Married	79(60.3%)	41(50.0%)	24(44.4%)	0	0.074
	Unmarried	52(39.7%)	41(50.0%)	30(55.6%)	2(100.0%)	
Type of Hospital	Private	70(53.4%)	55(67.1%)	44(81.5%)	2(100.0%)	0.002
	Government	61(46.6%)	27(32.9%)	10(18.5%)	0	
Job Role of participants	Anesthesia provider	64(48.9%)	42(51.2%)	23(42.6%)	0	0.008
	Surgical technician	43(32.8%)	32(39.0%)	18(33.3%)	1(50.0%)	
	Surgeon	20(15.3%)	4(4.9%)	5(9.3%)	0	
	OT nurse	4(3.1%)	4(4.9%)	8(14.8%)	1(50.0%)	
Educational Level of participants	Diploma	81(61.8%)	61(74.4%)	37(68.5%)	2(100.0%)	0.451
	Bachelor degree	29(22.1%)	15(18.3%)	11(20.4%)	0	

	MBBS/Masters/MD	21(16.0%)	6(7.3%)	6(11.1%)	0	
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Table 4: Level of Emotional Exhaustion.

Variable		Level of Emotional Exhaustion			P-Value
		Low	Moderate	High	
Gender of participants	Male	152(91.0%)	75(93.8%)	20(90.9%)	0.754
	Female	15(9.0%)	5(6.3%)	2(9.1%)	
Marital Status of participants	Married	101(60.5%)	35(43.8%)	8(36.4%)	0.012
	Unmarried	66(39.5%)	45(56.3%)	14(63.6%)	
Type of Hospital	Private	91(54.5%)	60(75.0%)	20(90.9%)	0.000
	Government	76(45.5%)	20(25.0%)	2(9.1%)	
Job Role of participants	Anesthesia provider	84(50.3%)	38(47.5%)	7(31.8%)	0.166
	Surgical technician	54(32.2%)	31(38.8%)	9(40.9%)	
	Surgeon	21(12.6%)	6(7.5%)	2(9.1%)	
	OT nurse	8(4.8%)	5(6.3%)	4(18.2%)	
Educational Level of participants	Diploma	110(65.9%)	52(65.0%)	19(86.4%)	0.067
	Bachelor degree	32(19.25%)	22(27.5%)	1(4.5%)	
	MBBS/Masters/MD	25(15.0%)	6(7.5%)	2(9.1%)	

Table 5: Level of Personal Accomplishment.

Variable		Level of Personal Accomplishment			P-Value
		Low	Moderate	High	
Gender of participants	Male	90(92.8%)	59(88.1%)	98(93.3%)	0.427
	Female	7(7.2%)	8(11.9%)	7(6.7%)	
Marital Status of participants	Married	59(60.8%)	31(46.3%)	54(51.4%)	0.159
	Unmarried	38(39.2%)	36(53.7%)	51(48.6%)	
Type of Hospital	Private	47(48.5%)	50(74.6%)	74(70.5%)	0.000
	Government	50(51.5%)	17(25.4%)	31(29.5%)	
Job Role of participants	Anesthesia provider	45(46.4%)	31(46.3%)	53(50.5%)	0.023
	Surgical technician	29(29.9%)	31(46.3%)	34(32.4%)	
	Surgeon	18(18.6%)	2(3.0%)	9(8.6%)	
	OT nurse	5(5.2%)	3(4.5%)	9(8.6%)	
Educational Level of participants	Diploma	60(61.9%)	55(82.1%)	66(62.9%)	0.001
	Bachelor degree	16(16.5%)	10(14.9%)	29(27.6%)	
	MBBS/Masters/MD	21(21.6%)	2(3.0%)	10(9.5%)	

Table 6: Level of Depersonalization.

Variable		Level of Depersonalization			P-Value
		Low	Moderate	High	
Gender of participants	Male	97(92.4%)	98(90.7%)	52(92.9%)	0.864
	Female	8(7.6%)	10(9.3%)	4(7.1%)	
Marital Status of participants	Married	73(69.5%)	44(40.7%)	27(48.2%)	0.000
	Unmarried	32(30.5%)	64(59.3%)	29(51.8%)	
Type of Hospital	Private	53(50.5%)	79(73.1%)	39(69.6%)	0.002
	Government	52(49.5%)	29(26.9%)	17(30.4%)	
Job Role of participants	Anesthesia provider	48(45.7%)	48(44.4%)	33(58.9%)	0.002
	Surgical technician	34(32.4%)	46(42.6%)	14(25.5%)	
	Surgeon	20(19.0%)	4(3.7%)	5(8.9%)	
	OT nurse	3(2.9%)	10(9.3%)	4(7.1%)	
Educational Level of participants	Diploma	64(61.0%)	80(74.1%)	37(66.1%)	0.028
	Bachelor degree	20(19.0%)	22(20.4%)	13(23.2%)	
	MBBS/Masters/MD	21(20.0%)	6(5.6%)	6(10.7%)	

Table 7: Anxiety, Depression, Emotional Exhaustion, Personal Accomplishment and Depersonalization Level Association with Wellbeing.

Level of Anxiety	Level of WHO-5 wellbeing index		P-Value
	Good Wellbeing	Poor Wellbeing	
Normal	132(51.8%)	3(21.4%)	0.000
Mild	69(27.1%)	2(14.3%)	
Moderate	52(20.4%)	7(50.0%)	
Severe	2(8%)	2(14.3%)	
Level of Depression			
Normal	128(50.2%)	3(21.4%)	0.003
Mild	78(30.6%)	4(28.6%)	
Moderate	48(18.8%)	6(42.9%)	
Severe	1(4%)	1(7.1%)	
Level of Emotional Exhaustion			
Low	162(63.5%)	5(35.7%)	0.058
Moderate	74(29.0%)	6(42.9%)	
High	19(7.5%)	3(21.4%)	
Level of Personal Accomplishment			
Low	96(37.6%)	1(7.1%)	0.001

Moderate	66(25.9%)	1(7.1%)	
High	93(36.5%)	12(85.7%)	
Level of Depersonalization			
Low	103(40.4%)	2(14.3%)	0.149
Moderate	100(39.2%)	8(57.1%)	
High	52(20.4%)	4(28.6%)	

DISCUSSION

According to the authors, this study represents the first comprehensive exploration in Pakistan of how various workplace factors influence the mental health of professionals in operating theatres (OT). It aims to elucidate how variables such as hospital type, occupational role and burnout contribute to anxiety, depression and psychological distress within this population. The findings highlight significant differences in mental health challenges between private and public hospital staff, with private hospital employees exhibiting higher levels of anxiety and depression (10).

This study identifies specific occupational groups such as anesthesia providers, OT nurses and surgical technicians as facing particularly high risks of psychological distress due to occupational exposure to pathogens during high stakes procedures (11), with anesthesia providers exhibiting the highest severity of distress among hospital staff (11), thereby underscoring the marked heterogeneity of mental health risks within healthcare teams.(11) (12)

The significant association between hospital type and mental health outcomes in our study echoes the findings of (5), who reported that increased workload due to pandemic pressures disproportionately affected surgical and operating room nurses in resource limited settings, leading to heightened depression, anxiety and stress. This supports the observation that private hospital staff, often facing resource constraints and higher patient loads in Swat, exhibited elevated mild and moderate anxiety and depression levels, respectively.

This study (13) highlighted that healthcare workers in Egypt's pandemic environment

experienced increased psychological distress linked to workplace stressors such as inadequate protective equipment and overwhelming responsibilities. Our findings reinforce this by demonstrating that anesthesia providers, OT nurses and surgical technicians roles demanding high vigilance and direct patient care bear a heavier burden of mental health challenges, consistent with (14), who emphasized the vulnerability of non-physician staff due to financial strain and limited workplace autonomy. The lack of significant correlations between demographic factors and mental health outcomes in our study aligns with (2) research among Hong Kong nurses, which found that occupational stressors including workplace aggression and job dissatisfaction were more predictive of anxiety and depression than gender or marital status. This convergence suggests that in high pressure healthcare environments, job related stressors eclipse personal characteristics in influencing psychological wellbeing.

The burnout profiles observed, notably the high emotional exhaustion and depersonalization in private hospital staff resonate with (15) framework and the WHO's (2019) classification of burnout as an occupational phenomenon. Our data parallel those of (4) who linked burnout to adverse mental health outcomes among anesthesiologists underscoring the chronic impact of stress in the workplace. This reinforces the imperative for systemic organizational interventions to reduce burnout and foster resilience, as advocated by (16) regarding the consequences of occupational stress on job performance.

Furthermore, the inverse relationship between psychological distress and wellbeing in our study

complements the Meta analytic findings of (17), which identified epidemic related workplace stress as a critical determinant of healthcare workers mental health. Our study extends this evidence to a rural, resource constrained setting, demonstrating that despite contextual differences, the detrimental effects of occupational stress on wellbeing remain consistent.

The heterogeneity of mental health outcomes across job roles found in our research also echoes (6), who reported that nurses in surgical systems faced distinct mental health challenges influenced by their workload and interpersonal dynamics. This supports the need for role specific mental health interventions tailored to the unique stressors experienced by anesthesia providers, surgical technicians and OT nurses.

Finally, the observed relationship between burnout dimensions and wellbeing aligns with the findings of (18), who underscored the mediating role of social support and mental health in managing stress overload and fatigue among operating theatre nurses. This suggests that enhancing workplace support networks could mitigate the impact of burnout on the wellbeing of OT professionals in Swat.

CONCLUSIONS AND RECOMMENDATIONS

This study highlights the prevalence of anxiety, depression and burnout among Operating Theatre (OT) professionals in the Swat District, Pakistan, with variations linked to workplace factors. Private hospital staff experienced greater psychological distress due to their increased workload and limited resources. Anesthesiologists, OT nurses and surgical technicians were identified as the most vulnerable groups. The inverse relationship between psychological distress, burnout dimensions and overall wellbeing demonstrates the impact of occupational stress on mental health. Demographic variables showed limited predictive value, emphasizing the importance of workplace conditions. These findings provide insights into the mental health challenges faced by healthcare workers in Pakistan and highlight the need for

organizational interventions to enhance resilience and improve patient care.

Targeted mental health support should prioritize anesthesiologists, OT nurses and surgical technicians through tailored education, training and psychosocial services that address role specific stressors. Structured workload and stress management programs focusing on time management, conflict resolution and effective communication are essential for reducing burnout. The integration of accessible psychosocial services, including telemedicine counseling and routine mental health monitoring, can provide continuous support. Hospital specific strategies are necessary, private hospitals should focus on workload redistribution, teamwork promotion and employee recognition, whereas government hospitals must improve resource allocation and equitable work distribution. Promoting regular rest breaks, stress management workshops and resilience building activities can enhance psychological health. Establishing on site counseling, peer support groups and regular burnout assessments will foster a supportive work environment, ultimately improving job satisfaction and the quality of patient care.

LIMITATIONS

The study's limitations include its geographic restriction to hospitals within District Swat, which limits its broader generalizability. The predominance of male participants (91.8%) and diploma holders (67.3%) further constrains the representativeness. Reliance on self reported data introduces potential bias in the assessment of anxiety and depression levels. Additionally, the exclusion of OT professionals with preexisting mental health conditions and those addicted to tobacco or alcohol may limit the applicability of these findings. Personal and external stressors were not considered which could influence mental health outcomes.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this paper.

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