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Original Research Article

Depression, anxiety and stress and their predictors among mortuary workers in Uttar Pradesh, India

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ABSTRACT

Background: Mortuary workers are a vital yet under-recognized workforce within the healthcare system, exposed routinely to distressing and potentially traumatic situations. The aim of the study was to assess the levels of depression, anxiety, and stress among mortuary workers in Uttar Pradesh using the DASS-21 scale, and to explore associations with their socio-demographic and occupational characteristics.
Methods: A cross-sectional descriptive study was conducted among 107 mortuary workers across district mortuaries of Uttar Pradesh. Data were collected through a structured, pretested questionnaire comprising socio-demographic information and the standardized Depression Anxiety Stress Scale-21 (DASS-21). Statistical analysis was performed using SPSS v25, applying chi-square and Fisher's exact tests to explore associations between mental health scores and independent variables. A p-value of <0.05 was considered statistically significant. Findings are exploratory.
Results: Based on the DASS-21 assessment, 1.9% of mortuary workers (1 mild, 1 moderate case) exhibited symptoms of depression, while 17.8% demonstrated symptoms of anxiety and 20.6% showed symptoms of stress. Anxiety and stress were significantly associated with shorter work experience, working more than eight hours per day, alcohol consumption, and lack of immunization. The sample was heavily male-skewed (106 of 107 participants).
Conclusions: While most mortuary workers reported normal levels of mental health, a vulnerable subgroup experienced elevated symptoms of depression, anxiety, and stress, particularly among newer, overworked, or non-immunized workers. Findings underscore the need for regular psychological screening, workplace support systems, and targeted mental health interventions.

Keywords: Mortuary workers, DASS-21, Depression, Anxiety, Stress, Occupational health, Occupational safety, Mental health, Uttar Pradesh, Healthcare workforce, Cross-sectional study

INTRODUCTION

Mortuary workers play a critical but often overlooked role in the healthcare system, ensuring the dignified handling of deceased individuals and supporting medico-legal processes. Despite their essential contribution, the nature of their work frequent exposure to death, human remains, traumatic injuries, and grieving families- places them at increased risk of psychological distress.[1,2] The environment in which mortuary workers operate is often

perceived as emotionally and physically taxing, characterized by contact with disfigured or decomposed corpses, potential biohazard exposure, and the persistent emotional weight of bereavement and mortality.[3,4]

Existing literature from various regions has highlighted the presence of mental health concerns among corpse handlers, including symptoms of depression, anxiety, and post-traumatic stress disorder.[5] Studies in South Africa, Nigeria, and Kenya have documented high levels of occupational stress among mortuary personnel, citing stressors such as inadequate protective gear, poor working conditions, high workload, lack of formal psychological support, and social stigma.[6-8] For many, the psychological toll is compounded by long working hours, shift duties, and limited opportunities for emotional decompression or counseling.[9,10]

Despite global recognition of the psychosocial risks faced by this occupational group, there remains a significant gap in empirical research specific to the Indian context, particularly in states like Uttar Pradesh, where mortuary facilities are often under-resourced, and staff work under challenging conditions. Cultural perceptions around death and impurity further exacerbate the stigma associated with mortuary work in India, potentially contributing to social isolation and underreporting of mental health issues among workers.

Moreover, studies have shown that coping mechanisms among mortuary staff vary widely- from humor, emotional detachment, and role modeling to maladaptive behaviors such as alcohol use or denial.[11-13] These strategies, while offering temporary relief, may not address the root causes of distress and may contribute to long-term mental health deterioration if not complemented by systemic support.[14]

Beyond mental health per se, prior work from other mortuary and deathcare settings has also raised concerns about gaps in occupational safety knowledge, attitudes, and practices - for example, inconsistent use of personal protective equipment, incomplete immunization coverage, and limited formal training among mortuary attendants.[15,16] This raises important questions for the present study population: are workers underestimating the risks associated with their work due to inadequate training and exposure? Is the apparent emotional stability observed in some settings a result of desensitization or normalization of hazards - especially among those with longer working hours and years of service? Could such gaps in preparedness eventually manifest as chronic stress, burnout, or long-term health complications? These concerns underscore the need to evaluate not only the current mental health status of mortuary workers but also the broader context of their occupational environment, safety practices, and coping strategies. The present study aims to address this by assessing mental health using the DASS-21 scale and examining associated socio-demographic and occupational factors among mortuary workers in Uttar Pradesh. This study did not administer a validated instrument to assess occupational safety knowledge, attitudes, and practices (KAP) directly among participants; formal assessment of KAP in this specific cohort is therefore identified as a priority for future research rather than reported as a finding of the present study (see Future Research).

Objectives

Taken together, the literature indicates that mortuary work is associated with meaningful psychosocial risk internationally, but that Indian, and specifically Uttar Pradesh-specific, empirical data using a validated psychometric instrument are lacking. This absence of state-level Indian data, set against a backdrop of under-resourced mortuary facilities and pronounced cultural stigma around death-related work, constitutes the research gap this study addresses.

The objective of this study was to assess the levels of depression, anxiety, and stress among mortuary workers in Uttar Pradesh using the DASS-21 scale, and to explore associations between these outcomes and socio-demographic and occupational characteristics. Given the large number of bivariate comparisons involved, this study is explicitly framed as exploratory and hypothesis-generating rather than confirmatory.

METHODS

Study design and setting

This study adopted a cross-sectional, descriptive research design to assess the mental health status of mortuary workers in Uttar Pradesh, India. The research was conducted in district mortuaries located in both urban and rural districts across the 18 divisions of Uttar Pradesh to capture a diverse representation of work environments. These settings were purposively chosen to reflect the typical occupational exposures and psychosocial stressors encountered by mortuary staff who are routinely engaged in handling human remains and assisting with post-mortem processes. The study was conducted from August 2024 to July 2025. Data were collected in district mortuaries of Uttar Pradesh, while data analysis and compilation were carried out at King George's Medical University, Lucknow.

Study population

The study population comprised 107 mortuary workers employed in district mortuaries at the time of data collection. This included individuals directly or indirectly involved in handling deceased bodies, such as body handlers, mortuary attendants, helpers, and support staff. Participants were selected through purposive sampling, based on the following inclusion criteria was age 18 years or older, currently employed in a mortuary setting for at least one month, and willingness to provide informed consent. Workers who were absent during the data

collection period or who declined participation were excluded from the study.

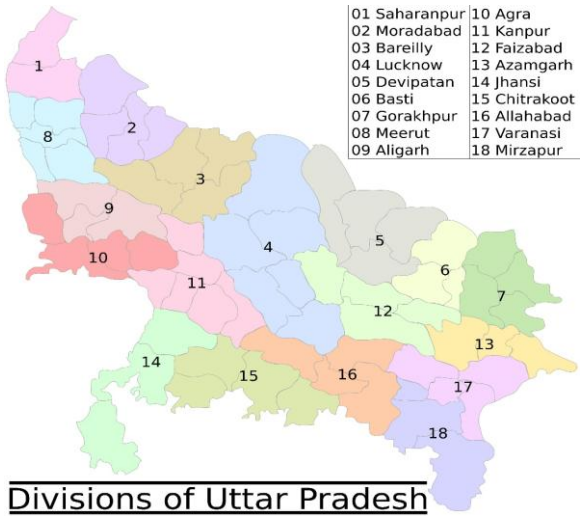

Figure 1: Geographical distribution of the study area across the 18 divisions of Uttar Pradesh. This map illustrates the administrative divisions of Uttar Pradesh from which mortuary workers were sampled, covering diverse urban and rural districts across the state.

Data collection tools and procedure

Data were collected using a structured, pretested questionnaire divided into two sections. The first section captured socio-demographic and occupational details including age, sex, marital status, education level, religion, dietary habits, place of residence (urban/rural), family type, number of family members, duration of employment, daily working hours, annual leave entitlements, immunization history, substance use (alcohol, tobacco, smoking), previous health ailments, and whether the participant had received formal occupational training.

The second section employed the Depression Anxiety Stress Scale - 21 items (DASS-21), a validated tool for assessing psychological distress. The scale contains 21 items divided equally across three subscales: Depression, Anxiety, and Stress. Each item was rated on a 4-point Likert scale ranging from 0 ("Did not apply to me at all") to 3 ("Applied to me very much or most of the time"), reflecting the severity of symptoms experienced in the past week. The tool is well-established for use in non-clinical populations, including occupational health assessments.

Data collection was conducted via face-to-face interviews in a private setting to ensure participant confidentiality and minimize response bias. Interviewers were trained in administering the DASS-21 and handling sensitive psychological topics.

Ethical considerations

This study was conducted in accordance with the ethical principles governing research involving human participants.

Ethical approval for this study was granted by the Institutional Ethics Committee (IEC) of King George's Medical University, U.P., Lucknow.

Written informed consent was obtained from all participants after an explanation of the study's purpose, procedures, confidentiality safeguards, and the voluntary nature of participation, including the right to withdraw at any stage without any effect on their employment. Each participant signed a consent form prior to enrolment.

Interviews were conducted in a private setting to protect confidentiality.

Data preprocessing

Data were entered and cleaned in Microsoft Excel prior to analysis in SPSS version 25.

Statistical analysis

Descriptive statistics - including frequencies, percentages, means, medians, and standard deviations - were computed to summarize demographic variables and DASS-21 scores. Each DASS-21 subscale score was derived by summing the seven corresponding items (each rated 0-3), giving a possible raw range of 0-21 per subscale prior to any conversion. The psychological states of depression, anxiety, and stress were categorized into severity levels (normal, mild, moderate) as per DASS-21 interpretation guidelines.

To explore associations between psychological outcomes and socio-demographic or occupational variables, inferential statistics were applied. Chi-square tests were used for bivariate analyses, and Fisher's exact test was employed where expected cell values were below 5. A p value of <0.05 was considered statistically significant.

Approximately 18 socio-demographic and occupational variables were tested against each of the three outcome domains, yielding roughly 50 individual bivariate significance tests, none of which was adjusted for multiple comparisons (e.g., Bonferroni or false-discovery-rate correction). At an uncorrected alpha of 0.05, several 'significant' results are expected to arise by chance alone even in the absence of any true association, and several of the p values reported here (e.g., 0.050, 0.045, 0.038) sit close to this threshold. Accordingly, this analysis is explicitly framed as exploratory and hypothesis-generating rather than confirmatory, and findings - particularly for the depression outcome, where the total number of non-normal cases was only two - should be interpreted with this in mind.

Only univariate (bivariate) associations are reported. Multivariable modelling (e.g., logistic or ordinal regression) to identify which predictors remain independently associated with each outcome after adjusting for plausibly correlated variables (for example, years of experience, immunization status, and work hours are all likely related to one another and to age) was beyond the scope of the present analysis and is identified as a

priority for future work. Similarly, effect-size measures (e.g., odds ratios or relative risk with 95% confidence intervals) alongside the p values reported here are planned for a subsequent analysis of this dataset.

Results were organized into tabular format and interpreted in the context of relevant literature.

RESULTS

Analysis of anxiety symptoms and their associations with socio-demographic and occupational variables

The assessment of anxiety among 107 mortuary workers using the DASS-21 scale revealed that the majority of participants experienced minimal symptoms. For instance, 100 participants reported no awareness of dryness in the mouth, while only 6 and 1 reported mild and moderate experiences, respectively. Similarly, 101 participants denied experiencing breathing difficulties unrelated to physical exertion, with only a small fraction (5 and 1) reporting mild to moderate symptoms. Trembling was absent in 103 participants, and only 4 participants expressed worry about situations that could lead to panic and embarrassment. The majority (97) did not feel close to panic, and 98 participants were unaware of increased heart activity in non-exertional situations. Moreover, 103 respondents did not report feeling scared without a valid reason. (These item-level figures illustrate individual DASS-21 anxiety items and should not be read as the overall severity distribution, which is summarized below and in Table 1).

The overall mean anxiety score was 1.33, with a standard deviation (SD) of 2.72, indicating low variability and a generally low level of anxiety among the participants. The median score was 0, with a minimum of 0 and a maximum of 14, further confirming that most individuals experienced little to no anxiety symptoms during the past week.

The analysis explored the relationship between anxiety levels and various socio-demographic and occupational variables among mortuary workers. The majority of participants (82.2%) exhibited normal anxiety levels, while 9.3% reported mild anxiety and 8.4% moderate anxiety. Although age did not show a statistically significant association ($p = 0.079$), higher proportions of mild and moderate anxiety were observed among younger workers, especially in the 18-30 years age group. Gender was not associated with anxiety ($p=0.897$); because the sample was 106 of 107 male, this null result reflects the extreme gender imbalance of the sample rather than a substantive finding and should not be read as evidence that gender is unrelated to anxiety in a more balanced cohort.

Education level showed varying patterns, with those having intermediate education displaying higher anxiety prevalence, though not statistically significant ($p=0.170$). Religion, dietary history, and family background also did not show significant associations. A key finding was the strong association between years of work experience and anxiety levels ($p<0.001$); those with less than one year of experience showed the highest proportion of moderate anxiety (55.6%).

Work hours were also significantly associated ($p=0.021$), with longer working hours (>8 hours/day) correlating with higher anxiety levels. Alcohol consumption had a statistically significant relationship with anxiety ($p=0.008$), where moderate anxiety was more frequent among alcohol consumers. Immunization status was at the conventional significance threshold ($p=0.050$), with non-immunized workers displaying higher anxiety levels.

Other variables, including marital status, family structure, tobacco use, smoking, leave entitlements, and training, were not significantly associated with anxiety. These findings highlight that limited work experience, longer working hours, and lifestyle factors such as alcohol use may contribute to elevated anxiety among mortuary workers.

Analysis of stress symptoms among mortuary workers using DASS-21

The assessment of stress among mortuary workers using the DASS-21 revealed generally low levels of stress symptoms in the study population. Most participants reported minimal or no stress across all seven items. For example, 102 participants did not find it hard to wind down, and only 5 participants reported moderate or higher levels of nervous energy. Agitation was uncommon, with 98 participants denying experiencing it. Similarly, the majority did not report difficulty relaxing (96 participants), overreacting to situations (88 participants), or feeling intolerant of obstacles to their work (89 participants). Notably, 99 respondents did not feel touchy, indicating low emotional irritability.

The mean stress score was 2.15, with a standard deviation of 3.78, suggesting a slightly broader variation in stress responses compared to anxiety. The median score was 0, and the range spanned from 0 to 22, indicating that while most participants experienced minimal stress, a few individuals reported elevated stress levels.

The analysis of stress levels among mortuary workers, categorized using DASS-21 into normal, mild, and moderate, revealed several patterns of association with demographic and occupational variables. A majority (79.4%) of workers exhibited normal stress levels, while 14.0% had mild and 6.5% moderate stress.

Age appeared to influence stress, with younger workers (18-30 years) showing higher proportions of mild (66.7%) and moderate (42.9%) stress compared to older age groups, though the association was not statistically significant ($p = 0.053$). Gender had no significant relationship with stress ($p = 0.878$); as with anxiety, this null result reflects the near-total male composition of the sample rather than a substantive finding.

Education level did not show a strong association with stress (p = 0.409), but participants with intermediate-level education showed a relatively higher prevalence of moderate stress (42.9%). Religion and dietary preferences were not significantly associated with stress levels.

A notable association was found between years of work experience and stress levels (p<0.001). Participants with less than one year of experience showed the highest proportion of moderate stress (57.1%), while those with more than five years of experience were mostly in the normal category. Similarly, alcohol consumption was significantly associated with stress (p<0.001), with moderate stress being more prevalent among alcohol users (57.1%).

Working hours also showed a significant relationship (p=0.023), where all participants with mild stress and most with moderate stress reported working more than 8 hours a day. Immunization status was another important factor (p=0.038); those who were not immunized had higher rates of moderate stress (85.7%).

Other variables such as marital status, background (rural/urban), family structure, number of family members, tobacco use, smoking, leave entitlement, health status, and formal training did not show statistically significant associations with stress levels.

These findings suggest that stress among mortuary workers may be influenced by limited work experience, long working hours, alcohol use, and lack of immunization, underlining the need for targeted occupational health interventions.

Depression levels among mortuary workers

The evaluation of depression symptoms among 107 mortuary workers, based on the DASS-21 scale, revealed that most participants reported very low levels of depressive symptoms. For several items, such as "I felt that life was meaningless", all 107 participants reported no depressive symptoms, and responses to other items followed a similar trend.

For instance, 97 participants indicated no difficulty in experiencing positive feelings, and 97 reported no issues with initiating tasks. Feelings of having nothing to look forward to were uncommon, with only 4 participants reporting mild symptoms and 6 reporting moderate symptoms. While 95 participants did not feel "down-hearted or blue," 9 reported mild and 3 moderate symptoms. Enthusiasm loss was almost nonexistent, with only 3 participants showing mild or moderate signs. Additionally, self-worth issues and feelings of being "not worth much" were mostly absent, though 11 participants reported mild to moderate levels.

The mean depression score was 1.36, with a standard deviation of 2.47, and a median of 0, indicating that depressive symptoms were absent or minimal for most respondents. The minimum score was 0, and the maximum was 14, suggesting that while depression was rare, a small number of workers experienced moderate levels.

These findings highlight that clinically relevant depressive symptoms were uncommon among this sample of mortuary workers, with most individuals reporting good mental well-being in relation to depression.

This analysis examined the associations between depression levels- classified as normal, mild, and moderate based on DASS-21 scores - and various demographic and occupational characteristics among mortuary workers. The vast majority of participants (98.1%) exhibited normal depression scores, with only 1 participant (0.9%) reporting mild and 1 participant (0.9%) reporting moderate depression, for a combined depression prevalence of 1.9%.

Age was not significantly associated with depression (p=0.600), although the single participant each with mild and moderate symptoms were both from the 18-30 years group. Gender showed no significant relationship (p=0.990), consistent with the overwhelming male majority. Similarly, education level (p=0.721), background (rural/urban), and family structure did not show meaningful associations, though the intermediate-education category contained both non-normal cases.

Religion showed a nominally significant association (p=0.042): the single moderate-depression case happened to be the only Muslim participant among those with any depressive symptoms. Work experience (p=0.002) and marital status (p=0.026) showed similarly nominal associations. Because the entire 'mild' and 'moderate' depression category together comprises only two individuals in the whole sample, every one of these p values is driven entirely by the placement of those two specific people across categories, rather than by a generalizable pattern; they are reported here for completeness but should not be treated as evidence of a robust risk factor for depression in this population.

Other factors, including number of family members, work hours, leave entitlements, training, and immunization status, did not show significant associations. Overall, depression was uncommon in this population, and the few associations observed with early-career stage, marital status, and religion should be interpreted with particular caution given that they emerged from only two cases within a model containing many variables; they very likely reflect statistical fluctuation rather than robust relationships. Nevertheless, these preliminary signals may highlight areas worth exploring more rigorously in a larger, adequately powered future study.

Table 1: Association between socio-demographic and work-related factors and levels of anxiety among mortuary workers (total n=107; normal n=88, mild n=10, moderate n=9).

Variables	Category	Normal		Mild		Moderate		P value
		N	%	N	%	N	%	
Age intervals (years)	18-30	22	25.0	7	70.0	4	44.4	0.079
	31-40	32	36.4	3	30.0	3	33.3	
	41-50	25	28.4	0	0.0	1	11.1	
	51-60	9	10.2	0	0.0	1	11.1	
Gender	Female	1	1.1	0	0.0	0	0.0	0.897
	Male	87	98.9	10	100.0	9	100.0	
Education level	Uneducated	3	3.4	0	0.0	1	11.1	0.170
	Primary	8	9.1	1	10.0	1	11.1	
	High school	22	25.0	1	10.0	1	11.1	
	Intermediate	16	18.2	4	40.0	4	44.4	
	Graduation	33	37.5	4	40.0	0	0.0	
	Post-graduate	6	6.8	0	0.0	2	22.2	
Religion	Hindu	76	86.4	9	90.0	7	77.8	0.724
	Islam	12	13.6	1	10.0	2	22.2	
Dietary history	Non-vegetarian	45	51.1	4	40.0	7	77.8	0.224
	Vegetarian	43	48.9	6	60.0	2	22.2	
Body handler*	Yes	64	72.7	7	70.0	6	66.7	0.917
	No	24	27.3	3	30.0	3	33.3	
Years of working	<1	1	1.1	0	0.0	5	55.6	<0.001
	1-5	11	12.5	6	60.0	3	33.3	
	>5	76	86.4	4	40.0	1	11.1	
Marital status	Married	80	90.9	9	90.0	8	88.9	0.986
	Unmarried	7	8.0	1	10.0	1	11.1	
	Widow	1	1.1	0	0.0	0	0.0	
Family structure	Joint	79	89.8	7	70.0	6	66.7	0.081
	Separate	6	6.8	2	20.0	1	11.1	
	Single	3	3.4	1	10.0	2	22.2	
Background	Rural	49	55.7	4	40.0	6	66.7	0.492
	Urban	39	44.3	6	60.0	3	33.3	
No. of family members	Up to 4	30	34.1	2	20.0	2	22.2	0.529
	5-10	47	53.4	7	70.0	7	77.8	
	>10	11	12.5	1	10.0	0	0.0	
Health ailment	No	85	96.6	10	100.0	9	100.0	0.717
	Yes	3	3.4	0	0.0	0	0.0	
Illness in past year	No	85	96.6	9	90.0	9	100.0	0.481
	Yes	3	3.4	1	10.0	0	0.0	
Tobacco use	No	43	48.9	4	40.0	4	44.4	0.851
	Yes	45	51.1	6	60.0	5	55.6	
Alcohol use	No	57	64.8	9	90.0	2	22.2	0.008
	Yes	31	35.2	1	10.0	7	77.8	
Smoking status	No	70	79.5	7	70.0	6	66.7	0.565
	Yes	18	20.5	3	30.0	3	33.3	
Work hours/day	≤8	16	18.2	1	10.0	5	55.6	0.021
	>8	72	81.8	9	90.0	4	44.4	
Annual leave	0 leaves	55	62.5	8	80.0	6	66.7	0.560
	<12 leaves	30	34.1	2	20.0	2	22.2	
	12-24 leaves	3	3.4	0	0.0	1	11.1	
Formal training	No	75	85.2	10	100.0	6	66.7	0.125
	Yes	13	14.8	0	0.0	3	33.3	
Immunized	No	33	37.5	3	30.0	7	77.8	0.050
	Yes	55	62.5	7	70.0	2	22.2	

*Body handler: worker directly involved in handling deceased bodies (as opposed to attendants, helpers or support staff).

Table 2: Association between socio-demographic and work-related factors and stress levels among mortuary workers (n=107; normal n=85, mild n=15, moderate n=7).

Variables	Category	Normal		Mild		Moderate		P value
		N	%	N	%	N	%	
Age intervals (years)	18-30	20	23.5	10	66.7	3	42.9	0.053
	31-40	33	38.8	3	20.0	2	28.6	
	41-50	23	27.1	2	13.3	1	14.3	
	51-60	9	10.6	0	0.0	1	14.3	
Gender	Female	1	1.2	0	0.0	0	0.0	0.878
	Male	84	98.8	15	100.0	7	100.0	
Education level	Uneducated	3	3.5	0	0.0	1	14.3	0.409
	Primary	9	10.6	0	0.0	1	14.3	
	High school	20	23.5	3	20.0	1	14.3	
	Intermediate	17	20.0	4	26.7	3	42.9	
	Graduation	31	36.5	6	40.0	0	0.0	
	Post-graduate	5	5.9	2	13.3	1	14.3	
Religion	Hindu	72	84.7	14	93.3	6	85.7	0.674
	Islam	13	15.3	1	6.7	1	14.3	
Dietary history	Non-vegetarian	44	51.8	7	46.7	5	71.4	0.541
	Vegetarian	41	48.2	8	53.3	2	28.6	
Years of working	<1	1	1.2	1	6.7	4	57.1	<0.001
	1-5	6	7.1	11	73.3	3	42.9	
	>5	78	91.8	3	20.0	0	0.0	
Marital status	Married	79	92.9	12	80.0	6	85.7	0.428
	Unmarried	5	5.9	3	20.0	1	14.3	
	Widow	1	1.2	0	0.0	0	0.0	
Family structure	Joint	76	89.4	12	80.0	4	57.1	0.060
	Separate	6	7.1	2	13.3	1	14.3	
	Single	3	3.5	1	6.7	2	28.6	
Background	Rural	47	55.3	8	53.3	4	57.1	0.984
	Urban	38	44.7	7	46.7	3	42.9	
No. of family members†	Up to 4	32	37.6	0	0.0	2	28.6	0.045
	5-10	43	50.6	13†	86.7†	5	71.4	
	>10	10	11.8	2	13.3	0	0.0	
Health ailment	No	82	96.5	15	100.0	7	100.0	0.671
	Yes	3	3.5	0	0.0	0	0.0	
Illness in past year	No	82	96.5	14	93.3	7	100.0	0.726
	Yes	3	3.5	1	6.7	0	0.0	
Tobacco use	No	39	45.9	10	66.7	2	28.6	0.192
	Yes	46	54.1	5	33.3	5	71.4	
Alcohol use	No	53	62.4	12	80.0	3	42.9	<0.001
	Yes	32	37.6	3	20.0	4	57.1	
Smoking status	No	65	76.5	14	93.3	4	57.1	0.144
	Yes	20	23.5	1	6.7	3	42.9	
Work hours/day	≤8	17	20.0	0	0.0	1	14.3	0.023
	>8	68	80.0	15	100.0	6	85.7	
Annual leave	0 leaves	53	62.4	12	80.0	4	57.1	0.385
	<12 leaves	29	34.1	3	20.0	2	28.6	
	12-24 leaves	3	3.5	0	0.0	1	14.3	
Formal training	No	74	87.1	12	80.0	5	71.4	0.451
	Yes	11	12.9	3	20.0	2	28.6	
Immunized	No	31	36.5	6	40.0	6	85.7	0.038
	Yes	54	63.5	9	60.0	1	14.3	

†Fisher's exact test applied (expected cell count <5).

Table 3: Association between socio-demographic and work-related variables and depression levels among mortuary workers (n=107; normal n=105, mild n=1, moderate n=1).

Variables	Category	Normal		Mild		Moderate		P value
		N	%	N	%	N	%	
Age intervals (years)	18-30	31	29.5	1	100.0	1	100.0	0.600
	31-40	38	36.2	0	0.0	0	0.0	
	41-50	26	24.8	0	0.0	0	0.0	
	51-60	10	9.5	0	0.0	0	0.0	
Gender	Female	1	1.0	0	0.0	0	0.0	0.990
	Male	104	99.0	1	100.0	1	100.0	
Education level	Uneducated	4	3.8	0	0.0	0	0.0	0.721
	Primary	10	9.5	0	0.0	0	0.0	
	High school	24	22.9	0	0.0	0	0.0	
	Intermediate	22	21.0	1	100.0	1	100.0	
	Graduation	37	35.2	0	0.0	0	0.0	
	Post-graduate	8	7.6	0	0.0	0	0.0	
Religion	Hindu	91	86.7	1	100.0	0	0.0	0.042
	Islam	14	13.3	0	0.0	1	100.0	
Dietary history	Non-vegetarian	55	52.4	0	0.0	1	100.0	0.366
	Vegetarian	50	47.6	1	100.0	0	0.0	
Years of working	<1	5	4.8	1	100.0	0	0.0	0.002
	1-5	20	19.0	0	0.0	0	0.0	
	>5	80	76.2	0	0.0	1	100.0	
Marital status	Married	96	91.4	0	0.0	1	100.0	0.026
	Unmarried	8	7.6	1	100.0	0	0.0	
	Widow	1	1.0	0	0.0	0	0.0	
Family structure	Joint	90	85.7	1	100.0	1	100.0	0.988
	Separate	9	8.6	0	0.0	0	0.0	
	Single	6	5.7	0	0.0	0	0.0	
Background	Rural	57	54.3	1	100.0	1	100.0	0.436
	Urban	48	45.7	0	0.0	0	0.0	
No. of family members	Up to 4	34	32.4	0	0.0	0	0.0	0.820
	5-10	59	56.2	1	100.0	1	100.0	
	>10	12	11.4	0	0.0	0	0.0	
Health ailment	No	102	97.1	1	100.0	1	100.0	0.971
	Yes	3	2.9	0	0.0	0	0.0	
Illness in past year	No	101	96.2	1	100.0	1	100.0	0.961
	Yes	4	3.8	0	0.0	0	0.0	
Tobacco use	No	50	47.6	0	0.0	1	100.0	0.366
	Yes	55	52.4	1	100.0	0	0.0	
Alcohol use	No	67	63.8	0	0.0	1	100.0	0.313
	Yes	38	36.2	1	100.0	0	0.0	
Smoking status	No	82	78.1	0	0.0	1	100.0	0.152
	Yes	23	21.9	1	100.0	0	0.0	
Work hours/day	≤8	22	21.0	0	0.0	0	0.0	0.768
	>8	83	79.0	1	100.0	1	100.0	
Annual leave	0 leaves	67	63.8	1	100.0	1	100.0	0.991
	<12 leaves	34	32.4	0	0.0	0	0.0	
	12-24 leaves	4	3.8	0	0.0	0	0.0	
Formal training	No	90	85.7	1	100.0	0	0.0	0.052
	Yes	15	14.3	0	0.0	1	100.0	
Immunized	No	41	39.0	1	100.0	1	100.0	0.219
	Yes	64	61.0	0	0.0	0	0.0	

DISCUSSION

The findings of our study present a compelling paradox. Despite the inherently distressing nature of mortuary work-characterized by prolonged exposure to death, bodily disfigurement, and often hazardous working conditions-the majority of our participants exhibited surprisingly low levels of anxiety, stress, and depression. Using the DASS-21 scale, we found that 82.2% of mortuary workers reported normal anxiety levels, 79.4% fell within the normal range for stress, and 98.1% had no clinically significant symptoms of depression. The mean scores for anxiety, stress, and depression were remarkably low -1.33 (SD=2.72), 2.15 (SD=3.78), and 1.36 (SD=2.47) respectively - with median scores of zero for each domain, suggesting minimal psychological disturbance across the cohort. These results not only challenge prevailing assumptions about the psychological vulnerability of this occupational group but also invite deeper exploration into cultural, environmental, and systemic buffers that might underlie this apparent resilience.[1,3,17]

When juxtaposed with international literature, however, our results stand in striking contrast. For instance, Nöthling et al reported that 13.3% of South African mortuary workers experienced self-reported depression and 4.4% PTSD, with significantly higher levels observed among less experienced workers.[5] Similarly, our data indicated that years of work experience had a strong statistical association with psychological distress, particularly stress ($p<0.001$) and anxiety ($p<0.001$). Workers with less than one year of experience reported the highest levels of moderate anxiety (55.6%) and moderate stress (57.1%), echoing Nöthling et al findings and reinforcing the idea that early occupational exposure without adequate psychological preparation heightens vulnerability.[5,7,17]

Furthermore, lifestyle and workplace variables emerged as important factors. Alcohol consumption was significantly associated with both anxiety ($p=0.008$) and stress ($p<0.001$), suggesting maladaptive coping mechanisms may be at play among some workers.[6,7,18] Likewise, those who worked more than 8 hours per day exhibited higher levels of anxiety ($p=0.021$) and stress ($p=0.023$), indicating that excessive workload may act as a cumulative stressor.[10,12] Immunization status, although not conventionally linked to psychological health, sat at the conventional significance threshold for anxiety ($p=0.050$) and showed a significant association with stress ($p=0.038$), perhaps reflecting broader concerns around occupational safety and vulnerability, consistent with reports of inconsistent immunization and protective-equipment practices in other mortuary settings.[8,15,18-20]

Despite the low overall prevalence of mental health symptoms in our sample, these associations with modifiable occupational factors are particularly salient. They align with earlier recommendations by Peterson et al who emphasized the importance of structured psychological interventions in their post-9/11 study of mortuary workers in the U.S. military.[22] Their behavioral health consultant model demonstrated how timely, culturally attuned, and professionally guided interventions could mitigate psychological risks. Our findings suggest that a similar proactive approach may be warranted - even in populations that do not outwardly exhibit high distress - particularly by targeting high-risk groups such as newly recruited workers, those working extended hours, and those lacking immunization or formal training.[9,10,13]

A recent global scoping review of deathcare workers similarly found that safety controls and sociodemographic characteristics - including education, gender, age, and work experience - are major predictors of occupational safety climate, and that deathcare facilities in resource limited settings frequently lack the social support systems and compensation schemes that might otherwise buffer workers against these occupational stressors.[16] This is consistent with the pattern observed in our data, where less-experienced and non-immunized workers in an under resourced state mortuary system showed disproportionately higher psychological symptom levels, and it reinforces the case for structured organizational support rather than reliance on individual resilience alone.[21,22]

While our study is novel in the Indian context and possibly among the first to systematically assess psychological health among mortuary workers in an Indian state using a validated psychometric scale, the low levels of reported distress may also point to underrecognition or underreporting. Cultural stigma, limited mental health literacy, or normalization of occupational trauma may contribute to this apparent emotional stoicism.[4,16,17] This underscores the value of mental health awareness efforts, occupational safety training, and structured occupational health policies tailored to the mortuary workforce - though, this study did not directly measure occupational safety knowledge, attitudes, or practices, and this recommendation should therefore be read as informed by the wider literature rather than as a direct finding of the present dataset. Formal induction modules incorporating psychological preparedness, periodic mental health screenings, and resilience-building workshops could serve as useful interventions in promoting long-term mental well-being, a possibility we intend to examine directly in future work.[9,14,15]

In conclusion, while our data challenge conventional narratives of psychological distress among mortuary workers, they also reveal underlying fissures that warrant attention. The statistically significant associations with work experience, alcohol use, work hours, and immunization status should guide future policy and practice, while the depression-specific associations described above should be treated as preliminary given their reliance on only two cases. The paradox of low symptom reporting amid high-risk occupational exposure demands a nuanced interpretation - one that balances the observed resilience with proactive strategies for

sustainable mental health in this overlooked yet vital workforce.[2,6,23]

Limitations

Several limitations should be considered when interpreting these findings. Participants were selected through purposive, non-probability sampling of district mortuaries across Uttar Pradesh, and while this pragmatic approach was appropriate for reaching a dispersed and hard-to-access occupational group, it limits how far the findings can be generalized beyond the sampled sites and to mortuary workers in other Indian states. The cross-sectional design further permits estimation of prevalence and identification of candidate associated factors but cannot establish the direction of any relationship; associations described as significant throughout this paper should accordingly be read as cross-sectional correlations rather than causal effects. The sample was also heavily skewed toward male participants (106 of 107), so the absence of a significant gender difference for any outcome reflects this imbalance rather than a genuine finding about gender and should not be generalized to a more balanced workforce. A further set of limitations concerns the statistical analysis itself. Only two participants in the entire sample scored above the normal range for depression, so the bivariate associations reported for this outcome are best regarded as descriptive observations rather than robust risk-factor findings. More broadly, roughly fifty bivariate significance tests were carried out across the three outcomes without correction for multiple comparisons, and the analysis is therefore best read as exploratory and hypothesis-generating rather than confirmatory; some of the associations close to the p=0.05 threshold may not replicate in an independent sample. Because bivariate testing cannot separate the effect of one variable from another with which it is correlated - years of experience, immunization status, and work hours are all plausibly related to one another and to age - the independent contribution of any single factor could not be established from this analysis, and effect sizes such as odds ratios or relative risks with confidence intervals, which would indicate the practical magnitude of each association, are not reported here. Finally, all psychological outcomes were based on self-report using the DASS-21, and the sample included a number of participants with little or no formal education. Because the questionnaire administration procedure did not include a formally validated translated version of the instrument or a documented comprehension-support protocol, some degree of measurement error cannot be ruled out for this subgroup, and this is a point the authors intend to address more systematically in future data collection.

CONCLUSION

This study assessed the mental health and associated factors among mortuary workers in Uttar Pradesh using the DASS-21 scale and found that while the large majority reported normal levels of depression, anxiety, and stress, a small but identifiable subgroup experienced elevated symptoms. Those who exhibited mild to moderate DASS symptoms were often early in their careers, worked longer hours, lacked immunization, or consumed alcohol - indicating that both occupational and behavioral factors may play a role in psychological vulnerability in this workforce. This study did not include a formal, validated assessment of occupational safety knowledge, attitudes, and practices (KAP) among participants; given evidence of gaps in this area from other mortuary and deathcare settings, a dedicated KAP assessment among Uttar Pradesh mortuary workers is recommended as a priority for future research rather than reported here as a finding of this study. It remains plausible, consistent with the wider occupational-safety literature though not directly tested by this dataset, that apparent psychological resilience in some workers may coexist with functional under-preparedness for occupational hazards; confirming this interpretation is an important direction for future work. These findings, taken together, point to the need for structured training, mental health support, and regular risk-focused interventions to strengthen both the physical safety and psychological resilience of this essential workforce.

Future Research

Building on these findings, a longitudinal design would help clarify the temporal, and potentially causal, relationships among work experience, work hours, immunization status, and psychological distress. A larger, adequately powered study focused specifically on the depression outcome is also warranted, given that only two cases were identified in the present sample, alongside a formal, validated Knowledge-Attitude-Practice (KAP) assessment of occupational safety and mental health awareness among Uttar Pradesh mortuary workers, which this study did not undertake. Once a larger dataset permits it, multivariable modelling with adjustment for correlated predictors should be carried out, reporting adjusted odds ratios with 95% CI alongside effect-size measures such as relative risk or Cramer's V for all retained associations. We also see value in evaluating structured psychological support interventions - such as the behavioral health consultant model described by Peterson et al adapted to the Indian mortuary workforce, and in including a more gender-balanced sample where feasible, so that gender differences in occupational mental health in this field can be assessed meaningfully.[22]

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