

# BMJ Open Prevalence and factors associated with symptoms of depression, anxiety and stress among traffic police officers in Kathmandu, Nepal: a cross-sectional survey

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## ABSTRACT

**Objective** This study aimed to assess the prevalence of depression, anxiety and stress, associated factors and stress-coping strategies among traffic police officers in Kathmandu, Nepal.

**Design** Cross-sectional survey.

**Setting** Kathmandu Valley, Nepal.

**Participants** A total of 300 traffic police officers working under the different traffic units of Kathmandu Valley for at least 6 months were recruited via a simple random sampling procedure.

**Primary outcome measures** State of depression, anxiety and stress among traffic police officers based on the Depression, Anxiety and Stress Scale.

**Secondary outcome measures** Coping strategies under stressful conditions based on the Coping Orientation to Problems Experienced Inventory (Brief-COPE) tool.

**Results** Altogether 124 (41.3%) traffic police officers had symptoms of depression, 141 (47%) had anxiety symptoms and 132 (44%) had symptoms of stress. Smoking was significantly associated with an increased likelihood of experiencing symptoms of depression (adjusted OR (AOR): 10.7, 95% CI: 4.8 to 23.6), anxiety (AOR: 7.1, 95% CI: 3.4 to 14.9) and stress (AOR: 6.8, 95% CI: 3.3 to 14.1). Similarly, longer working hours was significantly associated with higher odds of experiencing symptoms of depression (AOR: 3.4, 95% CI: 1.8 to 6.4), anxiety (AOR: 2.3, 95% CI: 1.3 to 3.9) and stress (AOR: 1.9, 95% CI: 1.1 to 3.4), and lack of physical exercise was associated with an increased likelihood of exhibiting depressive symptoms (AOR: 2.3, 95% CI: 1.1 to 4.7). Participants in this study used positive coping strategies more than negative coping strategies.

**Conclusion** Our study found a high prevalence of depression, anxiety and stress symptoms among traffic police officers in Kathmandu Valley, Nepal. Smoking and longer working hours were associated with an increased likelihood of experiencing symptoms of depression, anxiety and stress, and lack of physical exercise was associated with an increased likelihood of depressive symptoms.

## INTRODUCTION

Occupation plays a major role in anyone's life as the major portion of life is spent there.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ We used Depression, Anxiety and Stress Scale, which is a commonly used screening tool and has been validated for use in the Nepalese context.
- ⇒ Participants were randomly selected from the list of total traffic police officers in Kathmandu Valley, Nepal.
- ⇒ This study followed a cross-sectional design that limits our ability to infer causal relationships between independent variables and mental health outcomes.
- ⇒ The impact of environmental hazards and air pollution on mental health was not assessed in this study.
- ⇒ The tool used in the study was a screening tool and the outcome measures should not be interpreted as diagnoses of mental health conditions.

International Labour Organization/ World Health Organization (ILO/WHO) Joint Committee on Occupational Health has adopted a comprehensive aim of the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations.<sup>1</sup> The physical, psychological and social factors in the job have a great role in the physical and mental health of an individual.<sup>2</sup> Law enforcement agencies are considered to be highly stressful organisations around the world<sup>3</sup> and policing is one of the most mentally taxing occupations consisting of long and often rotating shifts, threats of violence, increased need for hypervigilance and a lack of public support creating chronic stress.<sup>4-7</sup>

Studies on occupational stress have shown that police officers are exposed to acute and chronic stressful events at work, which can result in impaired psychosocial well-being and physical health.<sup>8-10</sup> Traffic police are a special branch of the police force that direct traffic or serve in traffic or road policing

units enforcing rules of the road. The increasing population and vehicles have amplified the work and stress of traffic police officers. Previous research has identified work overload, poor work environment, lack of resources, infrastructure facilities, and the number of traffic police officers proportionate to population and number of vehicles as the main sources of stress among traffic police officers.<sup>11–13</sup> The lifestyles and working environment of police officers are under constant stress with the higher rate of smoking and alcohol addiction.<sup>14</sup> Traffic police personnel are at the highest risk of pollution-related diseases as they are constantly exposed to air pollution (vehicular emissions).<sup>15</sup> These factors might be playing a significant role in their psychosocial well-being.

Kathmandu Valley is the most populous city in the country and is one of the fastest-growing metropolitan cities in South Asia. Due to rapid urbanisation in the valley, there is a tremendous increase in vehicle numbers, especially personal vehicles, in recent years.<sup>16</sup> Though the population and vehicles in Kathmandu Valley are increasing at a rapid rate, neither the road conditions are developed to the extent nor the physical infrastructures are added to facilitate the proper traffic functioning. This has increased the workload of the traffic police.

Occupational safety and health (OSH) is a key issue in public health today. It is immensely important that workers have a healthy and safe environment at work, which should be of certain standards.<sup>17</sup> Despite the increasing interest in OSH, it has been subjected to continuous neglect by the governments. Despite the various health risks associated with the profession of the traffic police, one of the major aspects, that is, psychological well-being, remains unexplored. Hence, this study aimed to assess the prevalence of depression, anxiety and stress, its associated factors and stress-coping strategies among traffic police officers in Kathmandu, Nepal.

## METHODS

### Study design and setting

A cross-sectional study was conducted in the Kathmandu Valley, Nepal. Kathmandu Valley comprises three big cities of Nepal: Kathmandu, Bhaktapur and Lalitpur, and employs the largest number of traffic police officers in the country. Data were collected from October 2018 to April 2019.

### Study population and sampling

The study population was the traffic police working under the different traffic units of Kathmandu Valley for at least 6 months. The list of names of the traffic police officers was obtained from the Metropolitan Traffic Police Division. One thousand eighty-five traffic police officers meeting the inclusion criteria were entered in MS Excel 2010 to generate random numbers. The required sample size was obtained by applying a simple random sampling procedure. The sample size was calculated by using the finite population correction formula

with a 5% margin of error and 95% confidence level, and taking the prevalence of anxiety as 41.4%.<sup>18</sup> After adding a 10% non-response rate, the final sample size of 308 was calculated.

### Measures

Depression, Anxiety and Stress Scale (DASS-21)<sup>19</sup> was used to measure the emotional states of depression, anxiety and stress among the traffic police officers. DASS-21 is a commonly used and validated tool for measuring mental health outcomes in many countries including Nepal.<sup>20–23</sup> This is a 21-item scale measured on a 4-point rating scale (0–3), '0' denoting 'did not apply to me at all' and '3' denoting 'applied to me very much, or most of the time'. DASS-21 score was the outcome variable that ranged from 0 to 42. The cut-off (threshold) scores for detecting depression, anxiety, and stress were 10, 8, and 15, respectively.<sup>22</sup> Internal consistency of the tool was ascertained by calculating Cronbach's alpha, which was 0.7, 0.6, and 0.7, for depression, anxiety, and stress, respectively, and considered acceptable.

The Brief COPE, a 28-item inventory tool, was used to assess the coping strategies under stressful conditions.<sup>24</sup> The 28 items measure 14 coping strategies, and each item has scores ranging from 1 to 4. The possible scores on each strategy range from 2 to 8. Besides this, socio-demographic, behaviour characteristics and work-related factors were assessed to identify possible associations. Variables and their definition used in the study are provided in online supplemental table 1.

### Data collection

A self-administered questionnaire was used to collect the data from the participants at their respective traffic units. The principal investigator herself was involved in the data collection procedure and was assisted by research assistants. The participants were oriented about the purpose of the study and general instructions were given to fill in the questionnaire. It took about 15–20 min for each participant to fill in the questionnaire.

### Data management and analysis

Data were compiled, edited and checked for consistency, and processed through EpiData V.3.1, before exporting to IBM SPSS V.21 for the statistical analysis. Descriptive analysis of the variables was done in terms of frequency and percentage. Association between independent and dependent variables was measured by Chi square tests. To determine potential factors associated with the outcome variable, multivariable logistic regression analysis was performed, and adjusted OR (AOR) and 95% CI were calculated. Only those variables which were significant at a 5% significance level in bivariate analysis were included in the multivariable logistic regression analysis.

### Patient and public involvement

Patients or the public were not involved in the design, or conduct, or reporting, or dissemination plans of our research.

## RESULTS

### Sociodemographic, behavioural and work-related characteristics of study participants

A total of 300 traffic police officers participated in the study, giving a response rate of 97.4%. The mean age ( $\pm$ SD) of the participants was 29.10 ( $\pm$ 5.75) years. Among the participants, the majority were male (92.0%) and 63% were married. Brahmin/Chhetri (62.7%) was the major ethnic group followed by Janajati (22.7%). About 69.0% of the respondents belonged to joint/extended family but 63.0% were not staying with their family due to their duty placement. About two-thirds (61.0%) of the participants had a family income below 20 000 Nepalese rupees. Nearly 37% of the participants mentioned having health insurance. Around 95% of traffic police officers had to work in both day and night shifts, and almost half of them were working for 12 hours or more per day. Around 42% were willing to change their profession if given an opportunity with the same amount of income. In regard to support in the workplace, almost half of the respondents mentioned that they get support from their supervisor sometimes, whereas around 28% mentioned that they never received support from their supervisor. Nearly 60% of the respondents were not aware of any provision of stress management training in the traffic police force. Out of the total respondents, 28.3% were smokers, whereas 42% were alcohol consumers. Only 47.3% of the respondents were getting 6 hours of sleep. About 44% of the participants reported that they never get to eat food on time (table 1).

### Prevalence of stress, anxiety and depression among traffic police officers

The prevalence rates of stress, anxiety and depression were found to be 44%, 47% and 41.3% among the traffic police officers (table 2).

### Stress-coping strategies among traffic police officers

Distribution of the mean scores of stress-coping strategies assessed through the Brief COPE inventory tool is provided in online supplemental table 2. The top three positive coping strategies reported by respondents were use of instrumental support (mean (SD): 5.65 (1.75)), acceptance (mean (SD): 5.64 (1.92)) and planning (mean (SD): 5.56 (1.81)). Similarly, the top three negative coping strategies were venting (mean (SD): 5.38 (1.81)), use of emotional support (mean (SD): 5.15 (1.79)) and self-distraction (mean (SD): 4.59 (1.87)). Traffic police officers in this study used positive coping strategies more than negative coping strategies (online supplemental table 2).

### Factors associated with depression among traffic police officers

The traffic police officers who smoked were 10.7 (95% CI: 4.8 to 23.6) times more likely to have depressive symptoms compared with non-smokers. The traffic police officers who did not exercise regularly were 2.3 times more

**Table 1** Sociodemographic, behavioural and work-related characteristics of study participants (n=300)

Characteristics	Number	Percentage
Age (in years)		
21–30	196	65.3
31–40	90	30.0
>40	14	4.7
Gender		
Male	276	92.0
Female	24	8.0
Marital status		
Married	189	63
Unmarried	111	37
Ethnicity		
Brahmin/Chhetri	188	62.7
Janajati	68	22.7
Madhesi	29	9.6
Dalit	15	5.0
Family type		
Joint/extended	207	69.0
Nuclear	93	31.0
Staying with family		
Yes	111	37
No	189	63
Income per month (Nepalese rupees)		
<20 000 (<US\$163)	183	61.0
≥20 000 (≥US\$163)	117	39.0
<b>Work-related characteristics</b>		
Health insurance		
Yes	111	37.0
No	189	63.0
Working hours per day		
≤12	152	50.7
>12	148	49.3
Shift of work		
Day	17	5.7
Both	283	94.3
Switching of profession		
Yes	125	41.7
No	175	58.3
Interference of work in family time		
Most of the time	96	32.0
Sometimes	121	40.3
Never	83	27.7
Support from supervisor		
Most of the time	109	36.3

Continued

**Table 1** Continued

Characteristics	Number	Percentage
Sometimes	149	49.7
Never	42	14
Provision of stress management training		
Yes	123	41
No	177	59
Normal working environment		
Yes	25	8.3
No	275	91.7
<b>Behavioural characteristics</b>		
Smoking habit		
Yes	85	28.3
No	215	71.7
Alcohol drinking habit		
Yes	128	42.7
No	172	57.3
Sleeping hours		
<6	104	34.7
6	142	47.3
>6	54	18.0
Regularity of food		
Most of the time	120	40
Sometimes	47	15.7
Never	133	44.3
Regular health check-up		
Yes	83	27.7
No	217	72.3
Physical exercise		
Yes	221	73.7
No	79	26.3

likely to have depressive symptoms (AOR: 2.3, 95% CI: 1.1 to 4.7) than those who exercised. Those who were working 12 hours or more in working days most often in a week had 3.4 (95% CI: 1.8 to 6.4) times higher odds of having depression compared with those working less than 12 hours daily (table 3).

#### Factors associated with anxiety among traffic police officers

Multivariate analysis showed that smoking habit, alcohol drinking habit and working hours were statistically significantly associated with anxiety symptoms in the traffic police. Traffic police officers who used to smoke were almost seven times more likely to have anxiety than those who did not smoke (AOR: 7.10, 95% CI: 3.4 to 14.9). Alcohol drinkers had higher odds of having anxiety disorder compared with their counterparts (AOR: 1.9, 95% CI: 1.1 to 3.4). Those who were working 12 hours or more per day on most working days were 2.3 times more

**Table 2** Prevalence of stress, anxiety and depression among traffic police officers (n=300)

Outcomes	Categories	Number (%)
Depression (score of depression subscale)	Normal (0–9)	176 (58.7)
	Mild (10–13)	36 (12.0)
	Moderate (14–20)	52 (17.3)
	Severe ( $\geq 21$ )	36 (12.0)
	Total with depression	124 (41.3)
	Mean ( $\pm$ SD)	10.2 ( $\pm$ 7.3)
Anxiety (score of anxiety subscale)	Normal (0–7)	159 (53.0)
	Mild (8–9)	51 (17.0)
	Moderate (10–14)	43 (14.3)
	Severe ( $\geq 15$ )	47 (15.7)
	Total with anxiety	141 (47)
	Mean ( $\pm$ SD)	8.1 ( $\pm$ 5.6)
Stress (score of stress subscale)	Normal (0–14)	168 (56.0)
	Mild (15–18)	46 (15.3)
	Moderate (19–25)	48 (16.0)
	Severe ( $\geq 26$ )	38 (12.7)
	Total with stress	132 (44.0)
	Mean ( $\pm$ SD)	14.9 ( $\pm$ 7.9)

likely to have anxiety (AOR: 2.3, 95% CI: 1.3 to 3.9) than those working less than 12 hours daily (table 4).

#### Factors associated with stress among traffic police officers

Traffic police officers with smoking habits were 6.85 times more likely to have stress (AOR: 6.8, 95% CI: 3.3 to 14.1) than those who do not smoke. Those who had to work 12 hours and more in working days were 1.9 times more likely to have stress than those who work less than 12 hours (AOR: 1.9, 95% CI: 1.1 to 3.4). Similarly, the traffic police officers who wanted to change their profession were 2.2 times more likely to have stress (AOR: 2.2, 95% CI: 1.3 to 3.9) (table 5).

## DISCUSSION

This study found a high prevalence of depression, anxiety and stress symptoms among traffic police officers in Kathmandu, Nepal. More than 40% of traffic officers had experienced mild to severe symptoms of either depression, anxiety or stress. A similar study conducted among traffic police officers in Nepal reported a high prevalence of stress and anxiety.<sup>25</sup> However, studies among general police officers from countries like the UK, Malaysia, India and France have shown prevalence lower than that of the present study.<sup>26–29</sup> The difference in the prevalence could be attributed to the difference in the study tool used and the harsh working environment that traffic police officers in Kathmandu are exposed to during working hours.

The proportion of traffic police officers reporting symptoms of depression was lower than that reported by

**Table 3** Factors associated with depression among traffic police officers (n=300)

Variables	Depression n (%)	Crude OR (95% CI)	Adjusted OR (95% CI)
Gender			
Male	120 (43.5)	3.8 (1.3 to 11.5)*	1.0 (0.3 to 3.6)
Female	4 (16.7)	Reference	Reference
Physical exercise			
No	45 (57)	2.4 (1.4 to 4.0)**	2.3 (1.1 to 4.7)*
Yes	79 (35.7)	Reference	Reference
Smoking habit			
Yes	70 (82.4)	13.9 (7.4 to 26.3)**	10.7 (4.8 to 23.6)**
No	54 (25.1)	Reference	Reference
Alcohol drinking habit			
Yes	80 (62.5)	4.8 (2.9 to 7.9)**	1.8 (0.9 to 3.6)
No	44 (25.6)	Reference	Reference
Regular health check-up			
No	99 (45.6)	1.9 (1.1 to 3.3)*	1.1 (0.5 to 2.4)
Yes	25 (30.1)	Reference	Reference
Support from supervisor			
Never	21 (50.0)	2.1 (1.0 to 4.4)*	2.1 (0.8 to 5.5)
Sometimes	68 (45.6)	1.8 (1.1 to 2.9)*	1.4 (0.6 to 3.4)
Most of the time	35 (32.1)	Reference	Reference
Interference of work in family time			
Most of the time	47 (49.0)	2.2 (1.2 to 4.1)*	0.7 (0.3 to 1.6)
Sometimes	52 (43.0)	1.7 (0.9 to 3.2)	0.7 (0.4 to 1.6)
Never	25 (30.1)	Reference	Reference
Normal working environment			
No	119 (43.3)	3.0 (1.1 to 8.4)*	0.6 (0.2 to 1.9)
Yes	5 (20.0)	Reference	Reference
Provision of stress management training			
No	82 (46.3)	1.7 (1.0 to 2.7)*	0.6 (0.3 to 1.2)
Yes	42 (34.1)	Reference	Reference
Shift of work			
Both	122 (43.1)	5.7 (1.3 to 25.3)*	2.6 (0.5 to 14.3)
Day	2 (11.8)	Reference	Reference
Working hours per day			
>12	80 (54.1)	2.8 (1.8 to 4.6)**	3.4 (1.8 to 6.4)**
≤12	44 (28.9)	Reference	Reference

\*P<0.05; \*\*p<0.001.

Dhakai *et al.*<sup>30</sup> However, the studies conducted in Taiwan<sup>31</sup> and the USA<sup>32</sup> reported the prevalence of depression as 36% and 9%, respectively, which are lower than the findings of our study. The variation in the findings could be because those studies involved the general police rather than traffic police, and there was an availability of mental health services in the developed countries. In addition, other factors like rapid urbanisation, industrialisation, maintenance and widening of roads, and increasing

number and poor maintenance of vehicles in Kathmandu might have contributed to poor mental health symptoms in our study population.<sup>33</sup>

In the present study, no significant association was found between age and mental health outcomes of traffic police officers. It is in contrast to the study done by Husain *et al* where junior police officers reported higher stress, anxiety and depression.<sup>34</sup> All traffic police officers in Kathmandu, regardless of age, are subjected to a similar

**Table 4** Factors associated with anxiety among traffic police officers (n=300)

Variables	Anxiety n (%)	Crude OR (95% CI)	Adjusted OR (95% CI)
Regularity of food			
Most of the time	45 (37.5)	1.7 (0.9 to 3.4)	1.9 (0.8 to 4.6)
Sometimes	24 (51.1)	1.9 (1.2 to 3.2)*	1.7 (0.9 to 3.3)
Never	72 (54.1)	Reference	Reference
Smoking habit			
Yes	70 (82.4)	9.5 (5.1 to 17.7)**	7.1 (3.4 to 14.9)**
No	71 (33.0)	Reference	Reference
Alcohol drinking habit			
Yes	86 (67.2)	4.3 (2.7 to 7.1)**	1.9 (1.1 to 3.4)*
No	55 (32.0)	Reference	Reference
Health insurance			
No	100 (52.9)	1.9 (1.2 to 3.1)*	0.6 (0.3 to 1.1)
Yes	41 (36.9)	Reference	Reference
Shift of work			
Both day and night	138 (48.8)	4.4 (1.2 to 15.8)*	2.6 (0.6 to 10.3)
Day	3 (17.6)	Reference	Reference
Working hours per day			
>12	88 (59.5)	2.7 (1.7 to 4.4)**	2.3 (1.3 to 3.9)*
≤12	53 (34.9)	Reference	Reference

\*P&lt;0.05; \*\*p&lt;0.001.

harsh and hectic working environment. Contrary to the present study, several studies have found higher psychological stress in female police personnel.<sup>35–37</sup> Gender was not found to be significantly associated with mental health outcomes. The reason for this could be that overall, the number of female traffic police officers in the workforce is very few compared with men, and this was reflected in our study as well.

In this study, smoking was associated with higher odds of depression, anxiety and stress among traffic police officers. Similarly, traffic police officers with alcohol consumption habits had higher odds of having anxiety symptoms. This finding is supported by various studies where dependence on smoking, alcohol and substance use has been mentioned among the police due to their lifestyles and working environment.<sup>38–40</sup> Previous studies had shown that lack of resources, poor infrastructure and a high number of vehicles contributed to poor mental health in traffic police officers. In addition, this study has highlighted the role of personal habits like smoking and alcohol use that can increase the risk of suffering from mental illnesses.

In our study, traffic police officers who had to work more than 12 hours had higher odds of exhibiting depression, anxiety and stress compared with those working less than 12 hours. A study conducted in Scotland among police officers found that the main work-related stressors impacting the mental health of this key group were long

working hours and heavy workload.<sup>40</sup> A systematic review conducted by Purba and Demou also showed the significant associations of long working hours with mental health outcomes among police officers.<sup>41</sup>

Active and instrumental coping strategies (eg, gaining social support) have been associated with good adaptation to traumatic stress, while more passive coping strategies (eg, excessive alcohol intake) are often considered maladaptive, negative coping strategies.<sup>42–43</sup> Our study found that most of the participants used positive coping strategies more than negative coping strategies. Use of instrumental support, acceptance, planning and active coping were the major coping strategies. A similar result was observed in a study conducted among police officers in Italy.<sup>42</sup>

Occupational health has been a neglected field of public health in Nepal for many years. There has been some progress in this sector in the past few years like the enactment of the OSH policy. However, full implementation of the provisions in the policy is lagging. Just like traffic police officers, workers in many other occupations in civil service are very likely to suffer the same level of mental health symptoms. Organisational management of psychosocial hazards at the workplace should be given priority to ensure that workers remain in sound mental health.

The present study has some limitations which need to be acknowledged. Even though the participation in the study

**Table 5** Factors associated with stress among traffic police officers (n=300)

Variables	Stress n (%)	Crude OR (95% CI)	Adjusted OR (95% CI)
Gender			
Male	130 (47.1)	9.7 (2.3 to 42.5)**	0.3 (0.1 to 1.3)
Female	2 (8.3)	Reference	Reference
Smoking habit			
Yes	68 (80)	9.4 (5.1 to 17.3)**	6.8 (3.3 to 14.1)**
No	64 (29.8)	Reference	Reference
Alcohol drinking habit			
Yes	79 (61.7)	3.6 (2.2 to 5.7)**	1.5 (0.8 to 2.7)
No	53 (30.8)	Reference	Reference
Switching of profession			
Yes	70 (56)	2.3 (1.5 to 3.7)**	2.2 (1.3 to 3.9)*
No	62 (35.4)	Reference	Reference
Interference of work in family time			
Most of the time	48 (50)	2.3 (1.2 to 4.3)*	0.7 (0.3 to 1.5)
Sometimes	59 (48.8)	2.2 (1.2 to 3.9)*	0.6 (0.3 to 1.2)
Never	25 (30.1)	Reference	Reference
Normal working environment			
No	126 (45.8)	2.7 (1.0 to 6.9)*	0.5 (0.2 to 1.6)
Yes	6 (24.0)	Reference	Reference
Income (Nepalese rupees)			
<20000 (<US\$163)	89 (48.6)	1.6 (1.0 to 2.6)*	0.7 (0.4 to 1.3)
≥20000 (≥US\$163)	43 (36.8)	Reference	Reference
Working hours per day			
>12	81 (54.7)	2.4 (1.5 to 3.8)**	1.9 (1.1 to 3.4)*
≤12	51 (33.6)	Reference	Reference

\*P<0.05; \*\*p<0.001.

was entirely voluntary with an assurance of non-disclosure of identity and confidentiality, chances of respondent bias may occur. Importantly, the tool used in the study should be taken into consideration while reporting mental health outcomes. The tool used in the study was a screening tool and the findings should not be interpreted as a diagnosis of mental health outcomes. Since there is a dearth of studies assessing the mental health status among the traffic police officers, we had to discuss the findings with studies that have included other police officers as well. As the number of female traffic police officers is comparatively low, our study represented a relatively less number of female participants as compared with men. This might have created a discrepancy while analysing the data. The impact of environmental hazards and air pollution on mental health was not assessed in this study. This study followed a cross-sectional design that limits our ability to infer causal relationships between independent variables and mental health outcomes.

Despite limitations, this study has explored the neglected area of occupational health in Nepal and can serve as a basis to introduce organisational-level management of

psychosocial hazards in the traffic police departments and prioritise behavioural changes to improve the mental health status of traffic police officers.

## CONCLUSION

This study finds a high prevalence of depression, anxiety and stress among Nepalese traffic police personnel. Smoking habit was significantly associated with higher odds of experiencing symptoms of depression, anxiety and stress. Similarly, longer working hours were significantly associated with a higher likelihood of experiencing symptoms of depression, anxiety and stress. Traffic police officers who did not exercise regularly were almost twice as likely to have depressive symptoms compared with those who exercised.

Workplace mental health screening is necessary for the early detection of mental illness and early intervention. Though the traffic police officers have little control over the sources of stress in the workplace, the measures like stress management training/programmes for all the officers, and regular physical and mental health check-ups

can help reduce the mental health problems. Future interventions and, potentially, broader screening policies in law enforcement agencies appear to be needed to systematically identify and refer officers to healthcare services while mitigating their concerns.

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**Contributors** BY—conceptualisation, methodology, acquisition of data, software, formal analysis, supervision, writing (original draft preparation). AKC—supervision, writing (original draft preparation). SB—software, formal analysis, writing (reviewing and editing). PMSP—conceptualisation, methodology, software, formal analysis, supervision, writing (original draft preparation), reviewing and editing. PMSP was the guarantor of this study. All authors revised, read and approved the final version of the manuscript.

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**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Not required.

**Ethics approval** Ethical approval was obtained from the Institutional Review Committee of the Institute of Medicine, Tribhuvan University, Nepal (reference number: 238 (6-11-E)/075/076). Permission was taken from the Metropolitan Traffic Police Office and respective traffic police stations. The objectives of the study were shared and written informed consent was taken from each of the participants. We ensured voluntary participation in the study, and the confidentiality and privacy of the participants were maintained.

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