

Social determinants of mental health problems among Nepalese migrants living in Australia

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Abstract

Mental health problems are prevalent among migrants living in Australia. This study aims to investigate the social determinants of mental health problems among Nepalese migrants living in Australia. An online Qualtrics survey was conducted with 252 Nepalese adults in Australia between April and June 2025. The questionnaire included validated mental health screening tools, including Depression, Anxiety, and Stress Scale (DASS-21), Multidimensional Scale of Perceived Social Support (MSPSS), and Everyday Discrimination Scale (EDS). Data were analysed using Program for Statistical Analysis (PSPP), and bivariate analysis and multiple linear regression were performed. The mean age of participants was 30.6 ± 7.11 years. The prevalence of stress, anxiety, and depression was 40.5%, 22.6%, and 30.2%, respectively. In Model 1 (unadjusted for lifestyle behaviours), marital status (being married vs others) was negatively associated with stress ($\beta = -0.23$). Food insecurity was positively associated with stress ($\beta = 0.27$), anxiety ($\beta = 0.22$), and depression ($\beta = 0.25$). EDS scores showed positive associations with stress ($\beta = 0.46$), anxiety ($\beta = 0.38$), and depression ($\beta = 0.39$). In Model 2 (adjusted for the influence of lifestyle behaviours), being married remained as a significant negative predictor of stress ($\beta = -0.06$). Food insecurity also remained as a positive predictor of stress, anxiety, and depression ($\beta = 0.26, 0.18, 0.24$, respectively). Discrimination also remained as a positive predictor of stress, anxiety, and depression ($\beta = 0.44, 0.52, 0.49$, respectively). These findings underscore the need to develop culturally sensitive mental health programs among Nepalese migrants living in Australia.

Introduction

Migration is a global trend and a natural process of globalisation and demographic changes ¹. Globally, the number of migrants increased from 174 million in 2000 to 304 million in 2024 [1]. The number of migrants in Australia rose from 5.9 million in 2010 to 8.6 million in 2024, representing an increase of approximately 46% [2]. This reflects a significant and continuing growth of migrants.

People from Nepal migrate to high-income countries for different reasons, including higher education and employment opportunities, and a better lifestyle [3]. The Nepalese community is one of the fastest-growing communities in Australia, with the Nepal-born population increasing to 179,050 in 2024, which is more than five times the 34,750 recorded on 30 June 2013 [3]. As of 30 June 2024, the Nepal-born population residing in Australia was the 8th highest among overseas-born people [3]. The majority of immigrants from Nepal are young adults, with almost 55% male, and are usually first-generation migrants [4]. This demographic pattern is important as younger age groups and first-generation migrants are reported to experience high stress, anxiety, and depression [5]. Education is a major reason among Nepalese migrants, representing 8% of all international students in Australia [6].

Evidence suggests that migrants generally experience poorer mental health than the host populations. For instance, systematic reviews published in 2017 [7] and 2019 [8] reported high rates of stress (15.6%), anxiety (27.31%), and depression (38.99%), among migrants living in industrialised countries. Another systematic review published in 2025 reported that the prevalence of stress, anxiety, and depression ranged from 23% to 59%, 20% to 50%, and 9% to 47%, respectively, among South Asian migrants living in industrialised countries [9]. Among migrants living in Australia, a higher prevalence of mental health problems was also reported, with

migrants from Greece showing a high prevalence of anxiety disorders (43.1%) compared to Australian-born individuals (15.8%). Depression is most prevalent among migrants from Lebanon (33%) and China (19%) [10]. In another industrialised country, Canada, depression rates were reported to be more than double in South Asian migrants (21%) compared to the national average (10%) [11, 12].

Pre-migration and post-migration factors influenced mental health, particularly among younger-aged (25 to 44 years), female, those who were unemployed, and those who lacked community networks, had low income, and faced language barriers [13, 14]. For instance, a study in the USA reported a higher prevalence of depression among non-English-speaking Indian participants (11%), compared with English-speaking participants (7%), suggesting that limited language proficiency may negatively influence mental health [15]. Unemployment and financial strain increase difficulties in maintaining day-to-day living expenses, which deteriorate living standards [16, 17]. Similarly, Nepalese university students in Australia reported lower life satisfaction compared to the native Australians [18]. Similarly, poor social and economic conditions, limited English proficiency, housing-related stress, unemployment, and low living standards among Nepalese migrants in the UK have been reported [19]. Also, the lack of contact and communication with friends, family, and communities causes loneliness and disconnection from social networks while settling in host countries [19].

There is little research on the social determinants of mental health problems among Nepalese migrants living in industrialised countries. This gap in knowledge is concerning, given the relatively young demographic profile of the Nepalese community and the settlement challenges they often encounter, including financial strain, educational pressures, and limited social support. Therefore, determining the prevalence rates and social determinants of mental health problems, including stress, anxiety, and depression, among Nepalese migrants living in Australia is crucial in designing tailored interventions and policies to promote well-being among Nepalese migrants and reduce the burden of mental health problems in Australia.

Methods

Study design

A cross-sectional study design was used to collect data from Nepalese migrants living in Australia. Data were collected between April and June 2025.

Sampling and participants selection

Eligible participants were Nepalese migrants aged 18 years or older, living in Australia, excluding those with a clinical diagnosis of severe mental health problems. Convenience and snowball approaches were used to identify Nepalese migrants living in Australia. Participants were recruited from social media, including Facebook. To reach potential participants, Nepalese community organisations and networks were also actively contacted, and permission was requested to share the survey on their Facebook groups and pages. A Facebook page was created where an invitation post containing the study details was published.

The sample size was calculated using G*Power software version 3.0 (Heinrich Heine Universität, Düsseldorf, Germany) for regression analysis with 80% power and $\alpha = 0.05$. Accounting for an estimated 20% attrition, a

minimum of 170 participants was required, and the final sample included 252 participants.

Ethics approval:

All methods were carried out in accordance with relevant guidelines and regulations. Ethical approval was obtained from Central Queensland University's Human Research Ethics Committee (Approval #25101). Informed consent was obtained from all participants before completing the survey. The privacy and confidentiality of information gathered throughout the study were strictly maintained.

Study tools

A questionnaire consisted of two parts, was created using the online platform Qualtrics. Part A consisted of questions about the general characteristics of participants, nutrition, health, and reproductive characteristics, and cultural values, early settlement, and mental health services. Part B focused on the mental health problems (Depression, Anxiety, and Stress-21 (DASS-21)) [20] along with Multidimensional Scale of Perceived Social Support (MSPSS) [21] and Everyday Discrimination Scale (EDS) [22].

DASS-21 is a self-reporting tool to explore non-clinical mental health problems, particularly depression, anxiety, and stress [23, 24]. DASS-21 score ranges from normal to extremely severe [20, 25]. Depression score is classified as normal (0–9), mild (10–13), moderate (14–20), severe (20–27), and extremely severe (28+). Anxiety score is classified as normal (0–7), mild (8–9), moderate (10–14), severe (15–19), and extremely severe (20+) [20, 25]. Stress score is classified as normal (0–14), mild (15–18), moderate (19–25), severe (26–33), and extremely severe (34+) [20]. This scale is a well-established instrument, tested and found to have excellent reliability and good validity [20] ($\alpha = 0.95$).

The MSPSS is a 12-item scale that measures three sources of support: family, friends, and significant others [21, 26]. It has 12 Likert scale (7-point) questions [26]. MSPSS has shown good construct validity and reliability ($\alpha = 0.96$) [27, 28]. It has been used in different populations and translated into various languages, such as Nepali [29], Arabic [30], Thai [Wongpakaran, 2011 #153], and Hindi [31]. It helps to explore the relationship between perceived social support and other variables through quantitative measures [21].

Everyday Discrimination Scale (EDS)

EDS is the most frequently used discrimination scale [22]. It consists of 9 items for discrimination and is assessed with a 6-point scale [22, 32]. EDS has good validity and reliability ($\alpha = 0.87$) [33]. This scale measures discrimination faced by individuals in a quantitative way that helps to find out the prevalence and correlates of perceived discrimination [34].

Data processing and analysis

The collected data in Qualtrics were transferred to the Program for Statistical Analysis (PSPP) version 2.0.1 for data processing and analysis [35]. Descriptive statistics were reported in frequencies, percentages, medians, means, and standard deviation (SD). Inferential statistical analyses were performed, including independent t-tests for bivariate comparisons, one-way ANOVA with Bonferroni post-hoc adjustments for group differences involving more than two categories. Pearson's correlation was performed to examine the

relationships between continuous variables. Multiple linear regression was then used to assess the association between sociodemographic variables and stress, anxiety, and depression scores. Only variables with significant bivariate differences with depression, anxiety, and stress scores were included in the first model to identify their association with mental health problems (Model 1, unadjusted). In Model 2 (adjusted), other lifestyle behaviour variables investigated in this study with significant bivariate differences with depression, anxiety, and stress scores were included to control for their confounding influence on the association between sociodemographic variables and mental health problems. The statistical significance level (α) of < 0.05 was considered.

Results

Participants characteristics: The general characteristics of the study participants are presented in Tables 1, 2, and 3. Of the total 252 participants, just over half (50.8%) were male, and the mean age of participants was 30.6 years, with $SD \pm 7.11$ years. Most (74.6%) were married, with half living with a partner (50.8%), and 23.8% lived alone. A third of participants (32.9%) had been living in Australia more than five years, followed by 1-4 years (45.6%) and more than 10 years (11.9%). Most of the participants obtained higher education (78.6%), followed by vocational education (16.7%) and secondary education or below (4.8%). Over half of the participants were employed in professional occupations (53.2%), followed by blue-collar (22.2%), and 7.5% were unemployed. Regarding social support during early migration, 91% received support from family and friends, while 9% did not receive any support. Most (58%) were aware of mental health service availability, and 38.8% were unaware of the services.

Lifestyle behaviour: Among participants, 4.8% were current smokers, 11.9% were ex-smokers, and 83.3% had never smoked. 9.5% reported drinking alcohol weekly, 16.3% monthly, 40.9% rarely, and 33.3% had never consumed alcohol. The majority of the participants reported good sleeping quality (62.3%). Nutritional habits showed that a majority did not meet the recommended intake (based on Australian Dietary Guidelines) of vegetables (77.4%), fruits (63.9%), and meat/alternatives (70.2%). About half of the participants (43.7%) engaged in 150–299 minutes of physical activity per week, while 25.8% reported less than 150 minutes and 30.6% exceeded 300 minutes per week.

Table 1: General characteristics of the Nepalese migrants living in Australia

Characteristics	No.	%/ or Mean (SD)
Age	252	30.58 (7.11)
Gender		
Male	128	50.8
Female	124	49.2
Length of stay in Australia		
< 1 year	24	9.5
1 - 4 years	115	45.6
5 - 9 years	83	32.9
>10 years	30	11.9
Education		
Year 12 and below	12	4.8
Certificate courses	42	16.7
University degrees	198	78.6
Ethnicity		
Brahmin	122	48.4
Chhetri	70	27.8
Janjati	26	10.3
Others (Dalit, Madeshi)	34	13.5
Marital Status		
Married	188	74.6
Unmarried	56	22.2
Others	8	3.2
Occupation		

Blue collar (such as trade, retail, technician, installer, mechanic, etc)	56	22.2
White collar (such as admin, director, accountant, attorney, assistant, etc.)	43	17.1
Professional (such as scientist, doctor, researcher, registered nurse, manager, allied health professional, teacher, artist, etc.)	134	53.2
No paid job	19	7.5
English language efficiency		
Very fluent	78	31.0
Fluent	132	52.3
Limited	42	16.7
Generation		
First generation	252	100
Religion		
Hindu	232	92.1
Others (Christian, Buddhist)	10	4.0
No religion	10	4.0
Household income		
<\$1000/week	74	53.6
\$1000-<\$2000/week	113	44.8
≥2000/week	65	25.8
Living arrangement/ status		
Living alone	60	23.8
Living with a partner	128	50.8
Couple living with children and parent	64	25.4
Weekly Rent		
\$250-\$499	111	44.0

\$500-\$749	88	34.9
Experienced Discrimination During Early Migration		
Less courtesy/respect	75	29.8
Thought I was not smart	21	8.3
Thought they were better than me	27	10.7
Others	128	50.8
Difficulties in Adjusting During Early Migration		
A little difficulty	86	34.1
No difficulty	31	12.3
Moderate difficulty	87	34.5
Extreme difficulty	48	19.1
Felt Isolated During Early Migration		
Not at all	66	26.2
A little	99	39.3
Moderately	51	20.2
Quite a lot	36	14.3
Support From Friends, Family, or Community During Early Migration		
Did not receive support at all	23	9
Received support a little bit	108	43.0
Received support quite a lot	121	48.1
Felt Confident During Early Migration		
Slightly confident	77	31
Neither confident nor hopeless	62	24.6
Confident	112	44.4

Time Taken to Settle in Australia		
0 to 2 years	213	84.5
2 to 5 years	28	11.1
>5 years	11	4.4
Awareness of Mental Health Services During Early Migration		
Neutral	75	29.8
Not aware at all	31	12.3
Quite aware	54	21.5
Slightly aware	92	36.5

Table 2: Nutrition, health, and reproductive characteristics of Nepalese migrants living in Australia

Characteristics	Total	
	No.	Percentage or Mean (SD)
Experience of Food Insecurity in the Past 12 Months		
Yes	18	7.1
No	234	92.9
Alcohol Consumption		
Weekly	24	9.5
Monthly	41	16.3
Rarely	103	40.9
Never	84	33.3
Smoking Status		
Ex-smoker	29	11.9
Current smoker	12	4.8
Never smoked	210	83.3
Age at Onset of Smoking		
Under 17	8	3.2
18- 20 years	8	3.2
>21 years	25	9.9
Sleep Duration Per Day		
< 7 hours	78	31.0
7-8 hours	160	63.5
> 8 hours	14	5.6
Sleep Quality Last Night		
Poor	17	6.7

Moderate	78	31.0
Good	157	62.3
Vegetables Intake		
<5 servings/day	195	77.4
5+ servings/day	57	22.6
Fruits Intake		
<2servings/day	161	63.9
2+ servings/day	91	36.1
Meat and Alternatives		
< 2 servings/day	177	70.2
2+ servings/day	75	29.8
Physical Activity Per Week		
<150 mins	65	25.8
150-299 mins	110	43.7
>300 mins	77	30.6
Female: Age at First Pregnancy		
18-29 years	35	28.2
30-39 years	10	8.1
Not applicable (7) (e.g., never been pregnant)	79	63.7
Satisfaction in Pregnancy		
Very satisfied	19	41.3
Satisfied	12	26.11
Neutral	15	32.7

Satisfaction in Childbirth			
Very satisfied	18	39.1	
Satisfied	14	30.4	
Neutral	14	30.4	

Table 3: Cultural values, early settlement, and mental health services of Nepalese migrants living in Australia

Characteristics	Total	
	No.	Percentage or Mean (SD)
Importance of Cultural Values (Beliefs, Traditions, and Cultural Practices)		
Very important	184	73.0
Somewhat important	57	22.6
Not important	11	4.4
Culture Difference Challenges Experienced During Early Migration		
Neither easy nor a challenge	51	20.2
Not challenging at all	48	19.1
Somewhat challenging	120	47.6
Very much challenging	33	13.1
Experience Having Connection and Social Networking with Nepalese Connection		
Neither pleasant nor unpleasant	84	33.3
Pleasant	144	57.2
Unpleasant	24	9.5
Availability of Mental Health Services in Your Area		
Yes	141	56.0
No	13	5.2
Unsure	98	38.8
Mental Health Services Available in Your Area		
Counselling	83	58.3
Crisis intervention	6	4.3
Support group	43	30.3
Therapy (Cognitive Behavioral Therapy, psychotherapy)	10	7.1

Mental health problems: The findings on mental health status (stress, anxiety, and depression) are presented in Table 4. The mean scores for stress was 7.60 ± 8.35 , anxiety was 8.67 ± 9.32 , and depression was 7.38 ± 9.22 . The prevalence of stress was 40.5%, anxiety was 22.6%, and depression was 30.2% among Nepalese migrants living in Australia. Regarding severity, most participants were classified as normal for stress (59.5%), anxiety (77.4%), and depression (69.8%). Mild symptoms were reported by 5.6% for stress, 7.9% for anxiety, and 6.7% for depression. Moderate symptoms were observed in 18.3% for stress, 9.5% for anxiety, and 13.1% for depression. Severe symptoms were reported in 5.2% of participants for both stress and depression, and 3.2% for anxiety. Extremely severe symptoms were most frequent for stress (11.5%), followed by depression (5.2%) and anxiety (2.0%).

Table 4: Prevalence of stress, anxiety, and depression symptoms among Nepalese migrants in Australia

Prevalence and severity	Stress		Anxiety		Depression	
	No.	%	No.	%	No.	%
Normal	150	59.5	195	77.4	176	69.8
Mild	14	5.6	20	7.9	17	6.7
Moderate	46	18.3	24	9.5	33	13.1
Severe	13	5.2	8	3.2	13	5.2
Extremely Severe	29	11.5	5	2.0	13	5.2
Prevalence% (95% CI)	40.5% (95% CI:34.5-46.5)		22.6 (95% CI: 17.5-27.7)		30.2 (95% CI: 24.5-35.9)	
Mean $\pm$ SD	7.60 ± 8.35		8.67 ± 9.32		7.38 ± 9.22	

SD: Standard Deviation

Social determinants associated with stress, anxiety, and depression: Tables 5, 6, and 7 present the bivariate analysis of depression, anxiety, and stress scores based on the characteristics of participants. For stress, not married, lower education (having year 12 or below), higher income, living alone, experiencing extreme difficulties during early migration, feeling isolate and no confident in early migration, experiencing unpleasant Nepalese connections, not having mental health services in the area, experiencing food insecurity, weekly alcohol consumption, poor sleep quality had significantly higher scores of stress ($P < 0.05$). A higher stress score was also correlated with younger age, low perceived social support from family, friends, and significant others, and experiencing discrimination every day ($P < 0.05$).

For anxiety, not married, higher income, lower rent, living alone, experiencing extreme difficulties during early migration, feeling isolated, and no confidence in early migration, experiencing unpleasant Nepalese connections, not having mental health services in the area, experiencing food insecurity, and poor sleep quality had significantly higher scores of anxiety ($P < 0.05$). A higher anxiety score was also correlated with

low perceived social support from family and significant others and experiencing discrimination every day ($P<0.05$).

For depression, not married, not from Brahmin ethnic background, higher income, lower rent, living alone, experiencing extreme difficulties during early migration, feeling isolate and no confident in early migration, experiencing unpleasant Nepalese connections, not having mental health services in the area, experiencing food insecurity, meeting recommended vegetable intake, lower physical activity, poor sleep quality had significantly higher scores of depression ($P_s<0.05$). A higher depression score was also correlated with younger age, low perceived social support from family, friends, and significant others, and experiencing discrimination every day ($P<0.05$).

Table 5: Bivariate Analysis of general characteristics and mental health problems among Nepalese migrants in Australia

Characteristic	Mean Stress $\pm$ SD	r/p-value (Stress)	Mean Anxiety $\pm$ SD	r/p-value (Anxiety)	Mean Depression $\pm$ SD	r/p-value (Depression)
Age		-0.147 (0.019*)		-0.120 (0.057)		-0.145 (0.021*)
Gender						
Male	7.33 $\pm$ 8.63	0.319	8.28 $\pm$ 8.93	0.448	6.89 $\pm$ 8.53	0.204
Female	7.89 $\pm$ 8.08		9.06 $\pm$ 9.73		7.89 $\pm$ 9.90	
Residing in Australia						
Less than 1 year	9.67 $\pm$ 9.61	0.586	11.42 $\pm$ 8.91	0.555	10.92 $\pm$ 9.69	0.243
1 to 4 years	7.43 $\pm$ 8.10		7.88 $\pm$ 8.82		6.89 $\pm$ 8.64	
5 to 9 years	7.86 $\pm$ 8.94		9.01 $\pm$ 10.56		7.64 $\pm$ 10.34	
10 years or years	5.93 $\pm$ 6.27		8.53 $\pm$ 7.74		5.73 $\pm$ 7.22	
Education						
Year 12 and below	13.0 $\pm$ 10.29 ^a	0.016*	13.50 $\pm$ 8.74	0.172	6.79 $\pm$ 8.96	0.055
Certificate courses	9.33 $\pm$ 8.39 ^b		8.90 $\pm$ 8.51		12.83 $\pm$ 10.32	
University degrees	5.93 $\pm$ 6.27 ^{ab}		8.32 $\pm$ 9.48		8.62 $\pm$ 9.74	
Ethnicity						
Brahmin	6.90 $\pm$ 8.03	0.09	7.56 $\pm$ 8.42	0.188	6.02 $\pm$ 7.90 ^a	0.036*
Chhetri	8.14 $\pm$ 8.54		13.50 $\pm$ 8.74		8.20 $\pm$ 10.61 ^a	
Janjati	7.14 $\pm$ 7.75		8.00 $\pm$		8.31 $\pm$ 9.59 ^a	

Others	9.12 ± 9.40		13.50 ± 8.47		9.88 ± 9.91 ^a	
Marital Status						
Married	6.73 ± 8.03 ^a	0.006*	7.61 ± 8.72 ^a	0.007*	6.21 ± 8.58 ^a	0.001*
Unmarried	9.57 ± 8.53 ^{ab}		11.54 ± 10.65 ^b		10.39 ± 10.29 ^b	
Others	14.25 ± 10.17 ^b		13.50 ± 8.47 ^{ab}		13.75 ± 9.94 ^{ab}	
Occupation						
Blue collar (such as trade, retail, technician, installer, mechanic, etc	6.79 ± 7.39	0.152	7.79 ± 8.02	0.419	7.39 ± 8.17	0.123
White collar (such as admin, director, accountant, attorney, assistant, etc.)	8.84 ± 9.68		8.88 ±9.13		8.37 ± 10.51	
Professional (such as scientist, doctor, researcher, registered nurse, manager, allied health professional, teacher, artist, etc.)	7.06 ± 7.63		8.51 ± 9.59		6.46 ± 8.64	
No paid job	11.05 ± 11.67		11.89 ± 11.30		11.58 ± 12.07	
Language (English)						
Very fluent	6.95 ± 8.14	0.509	8.31 ± 9.70	0.892	6.05 ± 9.28 ^a	0.301

Fluent	7.61 ± 8.67		8.73 ± 9.68		7.61 ± 8.67 ^a	
Limited	8.81 ± 7.73		9.14 ± 7.54		8.29 ± 7.43 ^a	
Religion	4.67 ± 6.43		6.67 ± 9.87		4.67 ± 6.43	
Hindu	7.69 ± 8.44	0.823	8.49 ± 9.20	0.796	7.27 ± 9.30	0.778
Others (Christian, Buddhist)	6.60 ± 7.83		10.20 ± 10.85		10.0 ± 8.06	
No religion	6.60 ± 7.31		11.20 ± 11.04		7.40 ± 9.09	
Income						
<\$1000/week	5.24± 6.28 ^a	0.010*	6.00 ± 7.24 ^a	0.011*	4.27 ± 6.58 ^a	0.002*
\$1000- <\$2000/week	8.19 ± 8.73 ^a		9.43 ± 9.76 ^{ab}		8.21 ± 9.05 ^{ab}	
≥2000/week	9.26 ± 9.24 ^{ab}		10.33 ± 10.12 ^b		9.48 ± 11.14 ^b	
Household composition						
Living alone	10.28 ± 8.96 ^a	0.009*	12.37 ± 10.90 ^a	0.001*	11.93 ± 9.0 ^a	0.000*
Living with partner	7.31 ± 8.52 ^{ab}		7.83 ± 8.94 ^{ab}		6.47 ± 8.88 ^{ab}	
Couple living with children and parent	5.72 ± 6.78 ^b		6.88 ± 7.52 ^b		4.94 ± 6.39 ^b	
Weekly Rent						
\$250-\$499	8.63 ± 9.05	0.074	9.73 ± 9.83 ^a	0.004*	8.85 ± 10.41 ^a	0.030*
\$500-\$749	7.86 ± 8.25		8.75 ±9.45 ^a		7.02 ± 8.55 ^a	

\$750-\$999	5.87 ± 7.37		7.42 ± 8.60 ^a		5.74 ± 8.01 ^a	
Experienced Discrimination During Early Migration						0.004*
Less courtesy/respect	8.27 ± 8.81 ^b	0.003*	9.65 ± 10.01 ^a	0.001*	8.13 ± 9.91 ^a	
Thought I was not smart	12.29 ± 9.43 ^b		6.60 ± 7.79 ^b		11.52 ± 8.60 ^b	
Thought they were better than me	9.70 ± 9.63 ^{ab}		11.85 ± 11.54 ^{ab}		10.67 ± 11.20 ^{ab}	
Others	6.02 ± 7.19 ^a		6.60 ± 7.79 ^{ab}		5.58 ± 8.0 ^{ab}	
Difficulties in Adjusting During Early Migration						
A little difficulty	5.95 ± 7.13 ^a	0.000*	7.23 ± 8.55 ^a	0.001*	5.98 ± 8.00 ^a	0.000*
No difficulty	9.23 ± 10.80 ^a		9.35 ± 10.38 ^a		8.00 ± 10.80 ^a	
Extreme difficulty	11.71 ± 9.90 ^b		13.38 ± 11.13 ^b		12.42 ± 11.31 ^b	
Felt isolated During Early Migration		0.002*		0.000*		0.000*
Not at all	7.79± 9.52 ^a		7.39 ± 9.06 ^a		6.67 ± 8.92 ^a	
A little	6.55 ± 7.33 ^a		7.82 ± 8.49 ^a		6.26 ± 8.41 ^a	
Moderately	6.08 ± 6.76 ^{ab}		6.51 ± 6.56 ^a		5.45 ± 6.60 ^a	
Quite a lot	12.33 ± 9.29 ^b		12.46 ± 11.60 ^b		10.49 ± 11.85 ^b	
Felt Confident Early During Migration		0.011*		0.000*		0.005*

Slightly confident	9.90 ± 9.53 ^a	12.08 ± 10.85 ^a	7.64 ± 8.38 ^a	
Neither confident nor hopeless	7.13 ± 7.06 ^b	7.29 ± 7.42 ^a	6.48 ± 7.92 ^a	
Confident	6.27 ± 7.85 ^b	7.05 ± 8.53 ^b	5.93 ± 8.24 ^b	
Support from Friends, Family, or Community During Early Migration				
Did not receive support at all	7.74 ± 9.19	8.17 ± 8.46	6.09 ± 6.86	
Received support a little bit	8.34 ± 8.74	9.48 ± 9.82	8.02 ± 9.96	
Received support quite a lot	6.73 ± 7.68	7.85 ± 8.91	6.93 ± 8.81	
Time to feel Comfortable/settled in Australia				
0 to 2 years	7.12 ± 7.99	9.93 ± 9.75	6.84 ± 8.58	
2 to 5 years	10.0 ± 9.37	11.57 ± 12.65	10.50 ± 12.38	
>5 years	10.91 ± 11.29	11.09 ± 10.97	10.00 ± 10.99	
Awareness of Mental Health Services in Early During Migration				
Neutral	8.09 ± 8.73	9.42 ± 10.51	8.28 ± 10.57	
Slightly aware	8.02 ± 8.08	8.83 ± 8.11	7.67 ± 8.49	
Multidimensional Scale of Perceived Social Support (MSPSS scale)				
MSPSS- Family	-0.185 (0.004*)	-0.157 (0.014*)	-0.193 (0.002*)	

MSPSS- Friends	-0.190 (0.003*)	-0.124 (0.053)	-0.219 (0.001*)
MSPSS- Significant other	-0.226 (0.000*)	-0.198 (0.002*)	-0.274 (0.000*)
Everyday Discrimination Scale (EDS)	0.408 (0.000*)	0.387 (0.000*)	0.449 (0.000*)

* Indicates a statistically significant difference at $p < 0.05$; r = Pearson correlation analysis; SD: Standard Deviation

Values sharing the same letter (a, b) are not significantly different from each other. Values with different letters indicate statistically significant differences (post hoc test, $p < 0.05$).

Table 6: Bivariate analysis of nutrition, health, and reproductive characteristics and mental health problems among Nepalese migrants in Australia

Characteristic	Mean Stress $\pm$ SD	r/p-value (Stress)	Mean Anxiety $\pm$ SD	r/p-value (Anxiety)	Mean Depression $\pm$ SD	r/p-value (Depression)
Food Insecurity						
Yes	17.78 $\pm$ 11.31	0.00*	17.33 $\pm$ 11.48	0.00*	17.89 $\pm$ 11.87	0.00*
No	6.82 $\pm$ 7.56		8.00 $\pm$ 8.82		6.57 $\pm$ 8.50	
Vegetables Intake						
<5 servings/day	5.44 $\pm$ 7.15	0.082	6.77 $\pm$ 8.93	0.096	4.77 $\pm$ 7.91	0.008*
5+ servings/day	8.24 $\pm$ 8.58		7.63 $\pm$ 7.97		8.14 $\pm$ 9.46	
Fruits Intake						
<2servings/day	7.25 $\pm$ 8.70	0.932	8.35 $\pm$ 8.85	0.150	6.75 $\pm$ 8.85	0.053
2+ servings/day	7.80 $\pm$ 8.17		8.84 $\pm$ 9.60		7.74 $\pm$ 9.42	
Meat and Alternatives						
< 2 servings/day	7.60 $\pm$ 8.55	0.191	7.87 $\pm$ 8.50	0.678	5.97 $\pm$ 8.19	0.886
2+ servings/day	7.60 $\pm$ 8.29		9.01 $\pm$ 9.66		7.98 $\pm$ 9.59	
Physical Activity Per Week						
<150 mins	8.25 $\pm$ 8.05	0.052	8.65 $\pm$ 8.48	0.077	7.94 $\pm$ 8.65 ^a	0.040*
150-299 mins	8.56 $\pm$ 8.84		9.96 $\pm$ 10.31		8.58 $\pm$ 10.23 ^b	
>300 mins	5.69 $\pm$ 7.62		6.83 $\pm$ 8.26		5.19 $\pm$ 7.80 ^{ab}	

Female: Age at First Pregnancy						
18-29 years	5.58 ± 7.58	0.083	6.11 ± 8.19	0.113	4.97 ± 8.45	0.088
30-39 years	7.40 ± 9.75		8.00 ± 9.19		6.40 ± 8.04	
Not applicable (7) (e.g., never been pregnant)	9.40 ± 7.82		10.51 ± 10.21		9.37 ± 10.48	

Satisfaction in Pregnancy						
Very satisfied	5.58 ± 8.26	0.260	6.53 ± 8.56	0.338	5.37 ± 9.19	0.272
Satisfied	6.17 ± 9.59		7.17 ± 10.11		6.67 ± 9.51	
Neutral	4.67 ± 6.62		5.73 ± 6.71		3.73 ± 5.85	
Satisfaction in Childbirth						
Very satisfied	4.56 ± 6.32	0.229	5.22 ± 7.30	0.271	4.56 ± 6.99	0.333
Satisfied	5.29 ± 9.10		6.43 ± 9.29		5.14 ± 9.34	
Neutral	6.71 ± 9.10		8.00 ± 8.77		6.00 ± 9.08	
Alcohol Consumption						
Weekly	20.0 ± 5.89 ^b	0.014*	16.50 ± 5.26 ^{ab}	0.169	15.50 ± 1.91	0.235
Monthly	9.56 ± 9.33 ^{ab}		11.02 ± 10.31 ^{ab}		8.83 ± 10.23	
Rarely	6.99 ± 7.92 ^b		8.21 ± 6.88 ^{ab}		8.83 ± 10.23	
Never	7.10 ± 8.12 ^b		7.83 ± 9.27 ^b		7.55 ± 10.01	
Smoking Status						
Ex-smoker	8.83 ± 9.63	0.601	7.52 ± 8.19	0.659	7.67 ± 6.76	0.963
Current	7.31 ± 8.15		8.53 ± 9.48		7.35 ± 9.62	
Never	7.30 ± 8.60		9.91 ± 9.05		9.13 ± 9.49	
Smoking Age						
Under 17	5.75 ± 4.95	0.239	7.25 ± 8.55	0.886	6.00 ± 5.55	0.753
18- 20 years	11.0 ± 12.69		10.25 ± 6.36		8.00 ± 8.88	
>21 years	8.88 ± 8.83		9.36 ± 9.39		7.36 ± 6.73	
Sleep Duration Per Day						
< 7 hours	8.82 ± 9.18	0.226	10.33 ± 9.71	0.283	8.54 ± 9.71	0.441
7-8 hours	7.26 ± 8.00		7.91 ± 8.98		6.95 ± 8.98	
> 8 hours	4.71 ± 6.64		8 ± 10.47		5.86 ± 7.58	
Sleep Quality Last Night						
Poor	14.0 ± 10.20 ^a	0.001*	14.59 ± 10.22 ^a	0.001*	13.76 ± 11.33 ^a	0.000*

Moderate	8.67 ± 8.16ab	10.64 ± 9.81ab	9.18 ± 9.65ab
Good	6.38 ± 7.88b	7.04 ± 8.56b	5.80 ± 8.32b

* Indicates a statistically significant difference at $p < 0.05$. r = Pearson correlation analysis; SD: Standard Deviation

Values sharing the same letter (a, b) are not significantly different from each other. Values with different letters indicate statistically significant differences (post hoc test, $p < 0.05$).

Table 7: Bivariate analysis of cultural values, early settlement, and mental health services and mental health problems among Nepalese migrants living in Australia

Characteristic	Mean Stress ± SD	r/p-value (Stress)	Mean Anxiety ± SD	r/p-value (Anxiety)	Mean Depression ± SD	r/p-value (Depression)
Importance of Cultural Values (Beliefs, Traditions, and Cultural Practices)						
Very important	7.28 ± 8.52	0.508	8.01 ± 9.14	0.172	7.45 ± 9.84 ^a	0.223
Somewhat important	8.74 ± 7.54		10.63 ± 8.75		9.23 ± 8.97 ^b	
Not important	7.09 ± 9.61		9.45 ± 13.89		6.80 ± 9.24 ^{ab}	
Culture Difference Challenges Experienced During Migration						
		0.285		0.031*		0.143
Neither easy nor a challenge	7.22 ± 8.04 ^b		8.31 ± 9.08 ^b		6.98 ± 8.33	
Not challenging at all	7.29 ± 9.94 ^a		6.75 ± 9.18 ^a		6.58 ± 10.31	
Somewhat challenging	7.17 ± 7.70 ^{ab}		8.43 ± 8.69 ^{ab}		6.92 ± 8.85	
Very much challenging	10.24 ± 8.58 ^{ab}		12.85 ± 11.16 ^{ab}		10.85 ± 9.86	
Nepalese Connection						
Neither pleasant nor unpleasant	8.86 ± 8.74 ^a	0.019*	10.79 ± 10.44 ^a	0.013*	9.40 ± 10.48 ^a	0.006*
Pleasant	6.39 ± 7.91 ^{ab}		7.18 ± 8.31 ^b		5.78 ± 8.03 ^b	
Unpleasant	5.93 ± 7.97 ^b		6.93 ± 8.70 ^{ab}		9.92 ± 9.66 ^{ab}	
		0.012*		0.081		0.022*

Availability of Mental Health Services in Your Area			
Yes	7.46 ± 8.75 ^b	7.08 ± 9.26	7.10 ± 9.09 ^b
No	13.85 ± 12.48 ^a	15.08 ± 13.28	15.54 ± 15.50 ^a
Unsure	6.97 ± 6.68 ^{ab}	7.88 ± 8.56	6.70 ± 7.84 ^a

Mental Health Services Available in Your Area					
Counselling	6.89 ± 7.82	0.644	8.31 ± 8.62	0.764	6.22 ± 7.50
Crisis intervention	12.67 ± 14.40		14.00 ± 14.42		12.00 ± 16.54
Support group	7.81 ± 9.32		8.56 ± 9.69		7.81 ± 10.39
Therapy (Cognitive behavioral therapy, psychotherapy)	8.22 ± 10.37		8.89 ± 9.85		9.33 ± 10.10

* Indicates a statistically significant difference at $p < 0.05$; r = Pearson correlation analysis; SD: Standard Deviation

Values sharing the same letter (a, b) are not significantly different from each other. Values with different letters indicate statistically significant differences (post hoc test, $p < 0.05$).

Results of linear regression analysis: Table 8 presents the multiple linear analysis of depression, anxiety, and stress scores based on the characteristics of participants. In Model 1 (unadjusted for the influence of lifestyle and other variables), higher perceived discrimination was significantly associated with higher stress ($\beta = 0.46$, 95% CI: 1.89, 3.69), anxiety ($\beta = 0.38$, 95% CI: 2.10, 4.18), and depression ($\beta = 0.39$, 95% CI: 2.27, 4.21). Being married was associated with a lower risk of stress ($\beta = -0.23$, 95% CI: -3.76, -2.86). In addition, food insecurity was also positively associated with stress $\beta = 0.27$, 95% CI: 5.14, 12.42), anxiety ($\beta = 0.22$, 95% CI: 3.65, 12.19), and depression ($\beta = 0.25$, 95% CI: 5.00, 13.10).

In Model 2, after adjustment for the influence of lifestyle and other variables, marital status remained negatively associated with stress ($\beta = -0.06$, 95% CI: -4.39, -2.07). Similarly, food insecurity continued to show a positive association with stress ($\beta = 0.26$, 95% CI: 4.62, 12.58), anxiety ($\beta = 0.18$, 95% CI: 2.44, 10.60), and depression ($\beta = 0.24$, 95% CI: 4.76, 12.66). Lower confidence during early migration was only negatively associated with depression ($\beta = -0.69$, 95% CI: -4.32, -1.62). Also, discrimination remained strongly and

positively associated with stress ($\beta = 0.44$, 95% CI: 1.88, 3.60), anxiety ($\beta = 0.52$, 95% CI: 2.14, 4.18), and depression ($\beta = 0.49$, 95% CI: 2.29, 4.19). Additionally, poor sleep was positively associated with stress ($\beta = 1.84$, 95% CI: 1.51, 8.75), anxiety ($\beta = 0.12$, 95% CI: 0.22, 8.48), and depression ($\beta = 0.12$, 95% CI: 0.29, 7.89). The R^2 values increased in Model 2 compared with Model 1 (stress: 0.27 to 0.32; anxiety: 0.28 to 0.29; depression: 0.29 to 0.38), suggesting Model 2 explains the association better.

Table 8: Multiple linear regression analysis of variables associated with stress, anxiety, and depression among Nepalese migrants living in Australia

Characteristics	Stress		Anxiety		Depression	
	β (95% CI)		β (95% CI)		β (95% CI)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Age	-0.03 (-0.16, 0.10)	-0.06 (1.20, -0.06)			-0.02 (-0.18, 0.12)	0.00 (-0.16, 0.16)
Marital Status (Married vs others)	-0.23 (-3.76,-2.86)	-0.06 (-4.39, -2.07)	-0.10 (-5.14 to 0.74)	-0.08 (-5.30, 1.86)	-0.06 (-4.16, 3.02)	-0.06 (-4.94, 2.32)
Ethnicity (Brahmin vs others)					-0.07 (-3.41, 0.67)	-0.07 (-3.57, 0.51)
Education (Year 12 or below vs others)	0.04 (-1.32, 2.56)	0.95 (-1.46,2.26)				
Income (>\$2000/week vs others)	0.09 (-0.65, 5.35)	0.08 (-0.91, 4.89)	0.01 (-3.03 to 3.49)	0.03 (-2.44, 3.90)	0.04 (-2.09, 4.23)	0.02 (-2.50, 3.88)
Weekly rent (\$250-\$499/week vs others)	0.05 (-1.00, 2.87)	-0.06 (-1.00, 2.80)	0.02 (-1.91 to 2.63)	0.03 (-1.71, 2.97)	0.03 (-1.67, 2.65)	0.01 (-2.05, 2.35)
Household composition (living alone vs others)	0.01 (-2.90,3.34)	0.10 (-1.42, 5.44)	0.08 (-1.95 to 5.45)	0.06 (-2.48, 4.92)	0.11 (-1.03, 6.07)	0.16 (-0.08, 6.94)
Food insecurity (Yes vs no)	0.27 (5.14, 12.42)	0.26 (4.62, 12.00)	0.22 (3.65 to 12.19)	0.18 (2.44, 10.60)	0.25 (5.00, 13.10)	0.24 (4.76, 12.66)
Isolate during early migration (Quite a lot vs others)	0.02 (-1.66, 2.56)	1.09 (-2.42, 1.86)	-0.06 (-3.71, 1.19)	-0.06 (-3.70, 1.14)	-0.02 (-2.86, 1.86)	-0.03 (-3.00, 1.62)
Confident during early migration (Slight vs others)	-0.09 (-0.42, 3.60)	-0.10 (-0.28, 3.76)	-0.17 (-5.78, 1.78)	-0.10 (-0.94, 5.56)	-0.11 (-0.03, 4.41)	-0.69 (-4.32, -1.62)
Discrimination during early migration (Thought I was not smart vs others)	0.06 (-1.52, 5.32)	0.06 (-2.04, 5.84)	0.07 (-1.67, 6.25)	0.04 (-2.31, 5.17)	0.04 (-2.40, 5.12)	0.04 (-2.28, 5.14)
Difficult to adjust during early migration (Extreme difficulty vs others)	-0.05 (-6.41, 2.77)	-0.05 (-6.41, 2.77)	-0.03 (-6.63 to 3.99)	-0.02 (-6.32, 4.35)	-0.02 (-5.91, 4.41)	-0.01 (-5.03, 4.47)

Experiencing Nepalese connections (Unpleasant vs others)	0.05 (-1.78, 4.80)	0.05 (-1.82, 4.80)	-0.01 (-4.18, 3.40)	-0.01 (-4.04, 3.44)	0.002 (-3.95, 5.41)	0.02 (-3.09, 4.19)
Availability of Mental Health Services (yes vs no)	0.02 (-13.28, 17.62)	0.01 (-16.76, 15.08)	-0.04 (-24.32, 11.50)	-0.07 (-28.63, 7.67)	-0.03 (-21.29, 12.91)	-0.06 (-26.54, 7.99)
MSPSS scale	0.02 (-0.16, 0.10)	0.00 (-0.60, 0.58)	0.09 (-0.20, 1.12)	0.09 (-0.17, 1.13)	0.03 (-0.50, 0.78)	0.03 (-0.48, 0.82)
EDS Scale	0.46 (1.89, 3.69)	0.44 (1.88, 3.60)	0.38 (2.10, 4.18)	0.52 (2.14, 4.18)	0.39 (2.27, 4.21)	0.49 (2.29, 4.19)
Physical Activity (>300 min/week vs others)						-0.02 (-2.74, 1.92)
Sleep quality (poor vs others)		1.84 (1.51, 8.75)		0.12 (0.22, 8.48)		0.12 (0.29, 7.89)
Alcohol consumption (weekly vs others)		-0.06 (-7.87, 1.97)				
Vegetable consumption (5 servings/day vs others)						-0.10 (-4.61, 0.13)
R ²	0.27	0.32	0.28	0.29	0.29	0.38

MSPSS: Multidimensional Scale of Perceived Social Support (MSPSS); EDS: Everyday Discrimination Scale; β = Standardized Coefficient; CI: Confidence Interval; Model 1: only sociodemographic variables with significant bivariate differences with depression, anxiety, and stress scores were included. Model 2: all other variables investigated in this study with significant bivariate differences with depression, anxiety, and stress scores were included to control for their confounding influence

Discussion

This study determined the current status of mental health problems and the social determinants of mental health problems among Nepalese migrants living in Australia. While the findings of this study revealed that a notable proportion of Nepalese migrants had a high prevalence of stress (40.5%), anxiety (22.6%), and depression (30.2%), multiple social determinants underpinning the development of those mental health problems were identified. These findings corroborate the results of previous studies. For example, a study conducted among South Asian men in the UK reported a high prevalence of anxiety (51.4%) and depression (20.8%) [36]. Also, a systematic review of African migrants conducted in 2022 reported a high prevalence of

anxiety (34.6%) and depression (33.2%), which are comparable to the findings reported in this present study [37]. In contrast, a systematic review conducted among migrants living in Australia reported that the pooled prevalence of depression among migrants from non-English speaking countries was 19.3%, which was higher than the prevalence among migrants from English-speaking countries (13.8%) [10]. Furthermore, a community-based cross-sectional study in the USA found a relatively low prevalence of depression, with only 7% among English-speaking Indian participants and 11% among non-English-speaking Indian participants [15]. Overall, most studies show that migrants experience high levels of mental health problems compared to the general population.

This study reported a range of social determinants that were associated with mental health problems among Nepalese migrants living in Australia. These included being unmarried, having food insecurity, and experiencing discrimination. The findings of this study are consistent with the findings reported by previous studies, showing that being unmarried, single, or separated reported a higher risk of mental health problems [38–40]. A study conducted among young migrants in Sweden in 2024 highlighted that being unmarried and living alone leads to loneliness due to family separation and adaptation challenges [38].

In this present study, food insecurity was a significant factor associated with mental health problems. This is consistent with studies among South Asians in Canada in 2014, highlighting the crucial role of stable access to food in supporting mental well-being [14]. Food insecurity is closely related to socio-economic conditions, caused by limited employment opportunities [41]. In the current study, participants who experienced higher discrimination, feelings of isolation, and lower confidence reported higher stress, anxiety, and depression scores compared to those who did not experience discrimination in their settlement in Australia. Discrimination was a predictor of mental health problems among Nepalese migrants living in Australia. Several studies have reported that discrimination against migrants was associated with mental health problems [42, 43]. Experiences of discrimination could cause social isolation, feelings of hopelessness, and interruptions in identity and cultural development [42]. For instance, a recent study (2025) among Bangladeshi migrants in Thailand found a strong association between discrimination and mental health, focusing on the need for anti-discrimination policies and social inclusion [44]. These findings highlight the urgency of developing anti-discrimination policies and culturally inclusive mental health services for migrants, including Nepalese communities in Australia.

This study did not identify education as a predictor of mental health problems. In contrast, many studies find an association between education or gender and mental health problems [45–48]. For instance, a study conducted among Haitian migrants living in the USA in 2020 reported that a lower level of education was strongly associated with a higher prevalence of mental health problems, including severe depression [45]. Likewise, migrants with higher education levels are more likely to receive mental health education, be more aware of the mental health problems, and actively seek information or resources to maintain better mental health [46]. Additional research is needed to gain a deep understanding of the association between education and mental health problems, highlighting the need for policies that promote mental health support and targeted interventions across different educational levels.

Strengths and limitations

There are various strengths in this study. The study comprehensively assessed a wide range of social determinants of mental health problems, including socio-economic, nutritional, health, and behavioural factors. Additionally, participants were recruited from almost all regions of Australia, enhancing geographic coverage. The use of validated and easily applicable scales further strengthens the reliability and applicability of the findings.

Some studies in the past were conducted to determine the social determinants of mental health problems among various populations living in Australia [7, 14, 36]. Yet to the best of our knowledge, this is the first study ever conducted into mental health problems and their social determinants, specifically among Nepalese migrants living in Australia.

This study also involves some important limitations such as this study used self-reported study tools, which might have minimised the likelihood of in-depth understanding and lived experiences of the migrants. Most participants were also young and educated, which may have influenced the findings by limiting the generalisability to older or less-educated Nepalese migrants living in Australia. Additionally, individuals who were unable to understand English may have had different perspectives, which were excluded from the study, potentially limiting the inclusivity and cultural relevance of the findings.

Another limitation of the study was that the social determinants of mental health problems identified were closely interrelated and did not operate independently, whereby one risk might increase the likelihood of another. For example, limited language proficiency may increase the risk of unemployment [49, 50], which further increases financial stress linked to mental health problems. Similarly, low social support may heighten experiences of discrimination [42], increasing the risk of mental health problems. Because the study analysed these determinants separately, it was not able to examine multiple social determinants of mental health problems simultaneously.

Conclusion

The findings of this study confirm that the Nepalese migrants living in Australia experienced a high level of mental health problems, including stress, anxiety, and depression. Key social determinants of mental health problems included being unmarried, having food insecurity, and experiencing discrimination. These findings underscore the need to develop culturally sensitive programs to address the mental health problems among Nepalese migrants living in Australia. There is also a need for community-based support strategies to promote social inclusion, improve access to mental health services, and address discrimination.

Declarations

Ethics approval and consent to participate

This study was approved from Central Queensland University's Human Research Ethics Committee (Approval #25101). All participants provided informed consent prior to participation in the study. The data collected are confidential and were used solely for research purposes.

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Author Contribution

Prashamsa Pandey: Writing – review & editing, Methodology, Formal analysis, Conceptualisation. **Saman Khalesi:** Writing – review & editing, Supervision, Validation, Methodology, Formal analysis, Conceptualisation. **Bharat Nepal:** Writing – review & editing. **Lal Rawal:** Writing – review & editing, Supervision, Methodology, Validation, Conceptualisation.

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Data Availability

The data that support the findings of this study are not publicly available due to restrictions in the participants' consent and ethical approval. Data can be made available upon reasonable request from the corresponding author, subject to approval from the ethics committee.

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