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Level of fear towards COVID-19 and its determinants among healthcare providers in Malaysia: A cross-sectional study

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Abstract

Introduction: Malaysia is one of the hardest-hit countries by COVID-19 in Asia. The rapidly rising number of cases had sparked fear among healthcare providers. This study aimed to assess the determinants of fear towards COVID-19 among healthcare providers in primary care settings.

Methods: This online-based cross-sectional study was conducted among 1280 healthcare providers aged ≥18 years from 30 primary care clinics in the state of Selangor, Malaysia. The Fear of COVID-19 Scale was used to assess the level of fear, and the results were analysed using multiple linear regression.

Results: The mean age of the respondents was 36 years, and the mean working experience was 11 years. The majority of the respondents were women (82.4%) and Malays (82.3%). The factors that were significantly correlated with higher levels of fear were underlying chronic disease (ß=1.12, P=0.002, 95% confidence interval [CI]=0.08, 3.15), concern about mortality from COVID-19 (ß=3.3, P<0.001, 95% CI=0.19, 7.22), higher risk of exposure (ß=0.8, P<0.001, 95% CI=0.14, 5.91), concern for self at work (ß=2.8, P=0.002, 95% CI=0.08, 3.10) and work as a nurse (ß=3.6, P<0.001, 95% CI=0.30, 7.52), medical laboratory worker (ß=3.0, P<0.001, 95% CI=0.12, 4.27) and healthcare assistant (ß=3.9, P<0.001, 95% CI=0.17, 5.73). The level of fear was inversely correlated with a higher work-related stress management score (ß=−0.9, P<0.001, 95% CI=−0.14, −5.07) and a higher sleep quality score (ß=−1.8, P<0.001, 95% CI=−0.28, −10.41).

Conclusion: Family physicians should be vigilant and identify healthcare providers at risk of developing COVID-19-related fear to initiate early mental health intervention.

Introduction

Fear is defined as the human adaptive mechanism in response to real or potential threatening events.[1] It has played a significant role in the context of the COVID-19 pandemic, particularly among healthcare providers (HCPs) who have been at the forefront of treating infected patients. During the COVID-19 pandemic, fear could stem from several factors, including fear of the unknown, social isolation, hypochondriasis, feelings of disgust, fear driven by information and motivation to comply with regulations.[2] Among individuals most affected by such fears are HCPs, who have encountered numerous challenges and uncertainties. HCPs not only fear contracting the virus themselves but also worry about potentially transmitting it to their family members and colleagues.[3]

A study conducted in Saudi Arabia among 737 healthcare workers found that around two-thirds of them had a moderate risk of fear, with women showing higher levels of fear (moderate=73.5%, severe=15.7%).[4] In another study conducted in India, the level of fear towards COVID-19 among Indian residents was assessed using the Fear of COVID-19 Scale (FCV-19S). The average FCV-19S score was 18.00 out of 28.00. Nearly half of the study population exhibited high levels of fear (45.2%).[5] Women, married individuals, individuals with a lower educational level and healthcare workers had higher risks of experiencing heightened fear.[5] A recent systematic review also reported that the pooled prevalence of fear among HCPs in Asia was 71.3% (95% confidence interval [CI]=54.6, 88.0).[6] Most previous studies have focussed on

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the levels of fear among nurses and doctors[7] and fewer studies among medical laboratory workers, drivers, medical assistants and healthcare assistants, who are also significantly affected by COVID-19.[8]

The literature indicates that fear of COVID-19 can lead to various emotional consequences, including depression, anxiety disorders, sleep issues and even suicidal tendencies.[9,10] Additionally, HCPs may experience symptoms of burnout and contemplate resigning from their job owing to fear.[11] This fear-related negative impact can also potentially affect the performance of HCPs, leading to an increased risk of medical error.[12,13] Medical malpractice could be attributed to poor decision-making or adherence to clinical guidelines, while burnout could result in a hostile environment for patients.[14] Given the higher exposure risk faced by HCPs in relation to COVID-19, they may be more susceptible to experiencing these consequences.

To date, to the best of our knowledge, few studies have been conducted in this area, particularly among primary care HCPs in Malaysia. During the pandemic, HCPs in primary care clinics have been at the frontlines for assessing and managing patients with COVID-19. They have faced a larger population than did hospitals but had a smaller number of resources. Therefore, we conducted this study with the aim of assessing the level of fear towards COVID-19 and its determinants among HCPs in primary health clinics in Malaysia. Recognising and addressing the fear experienced by HCPs are crucial in maintaining their mental health and ensuring an effective delivery of care during the pandemic. Providing appropriate support systems, implementing infection control measures and disseminating accurate information about the virus can help alleviate fear and mitigate its impact on HCPs.

Methods

Study setting and population

This cross-sectional online study was conducted among HCPs from 30 public primary care clinics in the state of Selangor, Malaysia, from January to February 2022. During the COVID-19 pandemic, Selangor has been hit hard compared with other states. Official updates on COVID-19 cases in Malaysia indicated a sharp rise in the number of cases in Selangor during the study period. The primary care clinics were chosen from 52 public clinics with family medicine specialists owing to their unique relevance in accommodating patients with serious illnesses. Primary care clinics without family medicine specialists may not have the necessary expertise and resources to handle COVID-19 cases. Therefore, it is crucial to focus on clinics with family medicine specialists to obtain a more accurate understanding of the impact of the pandemic on HCPs' well-being and burnout level.

Inclusion criteria
Doctors, nurses, medical assistants, medical laboratory workers, drivers and healthcare assistants aged ≥18 years with a minimum working experience of 1 month in a public primary care clinic were eligible to be enrolled in this study.

The sample size was calculated using the G*Power software from Heinrich Heine University Düsseldorf in in the state of North Rhine-Westphalia15 based on the mean score of fear among women (19.2±6.9) and men (20.1±7.1) assessed using a 5-point Likert scale. With an expected effect size of 0.2, a P-value of 0.05 and a statistical power of 90%, the minimum sample size required to detect the indicated effect was 858. The final sample size was 1073 after accounting for a dropout rate of 20%.

Data collection and instrument

Simple random sampling with one-stage probability proportionality was used to recruit the respondents. Initially, a list of clinic-in-charge officers was obtained from the Family Medicine Specialist Association. There were 52 public primary care clinics with family medicine specialists in Selangor, Malaysia. After a sampling frame of 30 clinics was created, all doctors, medical officers, nurses, drivers and healthcare assistants in these 30 clinics were approached for participation in the study. An online questionnaire was created using Google Forms. Informed consent was obtained from the participants prior to answering the questionnaire. The self-administered structured questionnaire was used to capture the respondents' sociodemographic and clinical characteristics.

FCV-19S
The FCV-19S was also adopted in this study. The seven-item scale was used to rate the respondents' level of fear of COVID-19.[16] In this scale, responses are scored in a Likert scale with points ranging from 1 to 5

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(1=strongly disagree to 5=strongly agree). The total possible score ranges from 7 to 35, with higher total scores indicating higher levels of fear. The FCV-19S is a reliable and valid tool for assessing individuals' fear based on a Cronbach's α coefficient of 0.83. Concurrent validity testing has shown that this scale has a moderate correlation with the Hospital Anxiety and Depression Scale and the Perceived Vulnerability to Disease Scale. The Malay version of the FCV-19S has also shown a good reliability with a Cronbach's α coefficient of 0.893.17 In this study, the given information consisted of a scale-based survey related to individuals' feelings and fears concerning COVID-19. The participants were asked to rate their responses on a scale from 1 to 5, with 1 indicating the lowest level of fear or discomfort and 5 indicating the highest level. The seven items are as follows:

1. I am most afraid of COVID-19.
2. It makes me uncomfortable to think about COVID-19.
3. My hands become clammy when I think about COVID-19.
4. I am afraid of losing my life because of COVID-19.
5. When watching news and stories about COVID-19 on social media, I become nervous or anxious.
6. I cannot sleep because I am worrying about getting COVID-19.
7. My heart races or palpitates when I think about getting COVID-19.

Data analysis

The data were analysed using the Statistical Package for the Social Sciences version 26. The data were presented as frequencies, percentages, means or standard deviations. The chi-square test was performed to compare the associations between the categorical data. Conversely, independent t-tests were conducted for the continuous data to determine the associations between burnout (dependent variable) and the sociodemographic and clinical characteristics (independent variables). A bivariate analysis was performed to determine the association between the level of fear and sociodemographic and clinical characteristics (age, sex, race, educational level, occupation, years in service, number of affiliations, medical illness, stay with family members, frequency of quarantine, concern about mortality from COVID-19, concern for self at work, knowledge of where to seek help if developing mental illness and life insurance). Multiple linear regression was used to examine the determinants of fear among the HCPs after all assumptions on normality, equal variance, linearity, randomness and independence were fulfilled. P-values of <0.05 were considered statistically significant.

Results

A total of 1280 respondents participated in this study. **Table 1** shows the sociodemographic information of the respondents. The mean age of the respondents was 36 years, and the mean working experience was 11 years. The mean frequency of quarantine was two times. Almost half of the respondents were nurses. Most respondents were women and Malays, had no underlying comorbidities, lived with family members, knew where to seek help if they develop psychological distress and were worried about themselves at their workplace and about mortalities from COVID-19. Slightly more than half of the respondents had purchased life insurance. More than half worked in health clinics and were affiliated with more than one working centre involving the management of COVID-19.

Table 1. Sociodemographic and clinical characteristics of the respondents (N=1280).

Variables		n	%
Age	<36 years	666	52.3
	≥36 years	608	47.7
Sex	Female	1055	82.4
	Male	225	17.6
Race	Malay	1053	82.3
	Chinese	43	3.4
	Indian	118	9.2
	Others	66	5.2

Table 1. Continued

Variables		n	%
Occupation	Doctor	332	25.9
	Nurse	607	47.4
	Medical assistant	152	11.9
	Medical laboratory technician	82	6.4
	Driver	17	1.3
	Healthcare assistant	90	7
Highest academic qualification	Secondary school	204	15.9
	Diploma	620	48.4
	University	315	24.6
	Master's and above	141	11
Years in service	<11 years	712	55.6
	≥11 years	568	44.4
Affiliation	Health clinic	736	57.5
	COVID-19 assessment centre	10	0.8
	Quarantine centre	7	0.5
	Vaccination centre	1	0.1
	COVID-19 sampling centre	1	0.1
	More than one affiliation	521	40.7
	Others	4	0.3
Medical illness	Without medical illness	1020	79.7
	With chronic disease	260	20.3
Stay with family members	No	267	20.9
	Yes	1013	79.1
Infected family member	No	892	69.7
	Yes	388	30.3
Infection with COVID-19	No	1001	78.2
	Yes	279	21.8
Quarantine frequency	<2 times	713	55.7
	≥2 times	567	44.3
Worry about COVID-19 mortality	No	180	14.1
	Yes	1100	85.9
Worry about self at the workplace	No	40	3.1
	Yes	1240	96.9
Knowledge of where to seek help	No	155	12.1
	Yes	1125	87.9
Life insurance	No	600	46.9
	Yes	680	53.1

The mean FCV-19S score was 19.1±6. **Table 2** summarises the results of the bivariate analysis of the fear among the HCPs during the COVID-19 pandemic. A multiple linear regression analysis was performed to determine the predictors of fear among the HCPs after adjusting for confounders. All variables with P-values of <0.25 in the simple linear regression analysis were entered into the multiple linear regression analysis (**Table 3**).

Table 2. Association of fear with the sociodemographic and clinical characteristics among the healthcare providers during the COVID-19 pandemic evaluated using an independent t-test and Pearson correlation test (N=1280).

Variables		Fear score	Correlation[&]	P-value
Sex, female vs male		19.4±5.9; 17.6±6.4		<0.001
Race:	Malay	19.3±5.9		0.046
	Chinese	18.6±7.2		
	Indian*	17.7±6.7		
	Others	19.0±6.5		
Occupation:	Doctor	17.5±6.4		<0.001
	Nurse	20.2±5.6		
	Medical assistant[#]	17.2±6.3		
	Medical laboratory technician	19.0±6.0		
	Driver	18.6±4.6		
	Healthcare assistant	20.7±5.8		
Marital status: married vs others		19.2±6.0; 17.8±6.2		0.012
Tertiary vs non-tertiary educational level		18.4±6.4; 19.5±5.8		0.002
Without medical illness vs with chronic disease		18.8±5.9; 20.3±6.4		<0.001
Worry about COVID-19 mortality, no vs yes		14.7±5.8; 19.8±5.8		<0.001
Worry about self, no vs yes		12.8±6.0; 19.3±5.9		<0.001
Life insurance, no vs yes		19.5±5.9; 18.7±6.2		0.014
Infection with COVID-19, no vs yes		19.2±6.1; 18.6±5.8		0.100
Knowledge of where to seek help, no vs yes		19.9±6.4; 19.0±6.0		0.066
Stay with family members, no vs yes		19.3±6.0; 19.0±6.1		0.502
Infected family member, no vs yes		19.2±6.1; 18.7±6.1		0.369
More than one affiliation, no vs yes		19.3±5.9; 18.8±6.2		0.097
Age			0.063	0.025
Years of service			0.085	0.002
Exposure risk			0.172	<0.001
Quarantine frequency			0.077	0.006
Satisfaction with infection control			−0.069	0.014
Ability to handle stress			−0.234	<0.001
Altruism			−0.163	<0.001
Quality of sleep			−0.329	<0.001

[&]The analysis was conducted using the Pearson correlation test or an independent t-test.
*Indian was the reference group for ethnicity.
[#]Medical assistant was the reference group for occupation.

Table 3. Predictors of fear among the healthcare providers during the COVID-19 pandemic assessed using a multiple linear regression analysis (N=1280).

Variables		Simple linear regression			Multiple linear regression			95% CI LL	UL
		Unadjusted B	SE	P-value	Adjusted B	SE	P-value		
Occupation:	Doctor	−2.197	0.381	<0.001	−0.326	0.513	0.525	−0.024	−0.636
	Nurse	2.156	0.334	<0.001	3.591	0.477	<0.001	0.296	7.522
	Medical assistant*	−2.118	0.52	<0.001	Reference				
	Medical laboratory technician	−0.064	0.692	0.926	3.006	0.705	<0.001	0.122	4.266
	Driver	−0.456	1.479	0.758	1.339	1.311	0.307	0.025	1.021
	Healthcare assistant	1.772	0.66	0.007	3.928	0.685	<0.001	0.166	5.734
With chronic disease* vs without medical illness		1.592	0.419	<0.001	1.122	0.356	0.002	0.075	3.148
Worry about COVID-19 mortality, yes vs no		5.149	0.465	<0.001	3.278	0.454	<0.001	0.188	7.217
Exposure risk score		0.97	0.156	<0.001	0.808	0.137	<0.001	0.143	5.909
Ability to handle stress		−1.568	0.183	<0.001	−0.93	0.184	<0.001	−0.139	−5.065
Quality of sleep		−2.033	0.163	<0.001	−1.752	0.168	<0.001	−0.284	−10.41
Worry about self at the workplace		6.526	0.956	<0.001	2.759	0.891	0.002	0.079	3.096
Infection with COVID-19, no vs yes		−0.674	0.41	0.1	-				
Sex: female vs male*		−1.762	0.442	<0.001	-				
Race:	Chinese	1.044	0.442	0.018	-				
	Malay	−0.509	0.94	0.588	-				
	Indian*	−1.591	0.584	0.007	-				
	Otheres	−0.054	0.766	0.944	-				
Marital status: married vs others		1.4	0.555	0.012	-				
Tertiary vs non-tertiary educational level		1.121	0.352	0.001	-				
Knowledge of where to seek help, no vs yes		−0.954	0.518	0.066	-				
Stay with family members, no vs yes		−0.28	0.417	0.502	-				
Infected family member, no vs yes		−0.331	0.368	0.369	-				
More than one affiliation, no vs yes		0.572	0.345	0.097	-				
Age		0.057	0.025	0.025	-				
Years of working		0.084	0.028	0.002	-				
Quarantine frequency		0.283	0.102	0.006	-				
Satisfaction with infection control		−0.487	0.198	0.014	-				
Altruism		−1.016	0.172	<0.001	-				
Life insurance, no vs yes		−0.828	0.339	0.015	-				

**:reference group; SE: standard error; LL: lower limit; UL: upper limit

#. The adjusted R-squared was 28.3, and the model had a good fit with a P-value of <0.001. There was no multicollinearity, as the variance inflation factor was <10.

*The variable selection method in the multiple linear regression was based on the forward method to determine highly correlated variables.

In the multiple linear regression analysis, the factors that significantly correlated with higher levels of fear among the HCPs were underlying chronic disease (ß=1.12, P=0.002, 95% CI=0.08, 3.15), concern about mortality from COVID-19 (ß=3.3, P<0.001, 95% CI=0.19, 7.22), higher risk of exposure (ß=0.8, P<0.001, 95% CI=0.14, 5.91), concern for self at work (ß=2.8, P=0.002, 95% CI=0.08, 3.10) and work as a nurse (ß=3.6, P<0.001, 95% CI=0.30, 7.52), medical laboratory worker (ß=3.0, P<0.001, 95% CI=0.12, 4.27) and healthcare assistant (ß=3.9, P<0.001, 95% CI=0.17, 5.73). The level of fear was inversely correlated with a higher work-related stress management score (ß=−0.9, P<0.001, 95% CI=−0.14, −5.07) and a higher sleep quality score (ß=−1.8, P<0.001, 95% CI=−0.28, −10.41).

Discussion

This study aimed to determine the factors associated with fear of COVID-19 among HCPs from 30 public primary care clinics during the COVID-19 pandemic. Herein, the mean FCV-19S score was 19.1±6.1, which is consistent with the score reported in a study conducted in Saudi Arabia among 969 nurses (19.7±7.0)[18] but higher than the score reported in a locally conducted study among 720 individuals from the general population (17.5±6.3)[19], in a study conducted among 1499 individuals in India (18.0±5.7)[5] and in another study conducted among 3055 nurses across five European countries (15.2±5.9).[20] However, the score in the present study is lower than that in the study conducted by Alnazly et al. among 365 HCPs in Jordan.[21] Alnazly et al. reported that HCPs in Jordan showed moderate-to-high levels of fear, with a mean score of 24±7. The

mean score varies across studies, which could be attributed to differences in the study population. Our study included doctors, nurses, medical assistants, healthcare assistants, drivers and medical laboratory workers, while only a third of the respondents were HCPs in the local study[15] compared with all nurses in the European study.[20]

The present study found that work as nurses, medical laboratory workers and healthcare assistants was a predictor of fear. This finding is consistent with previous reports[20,22–24] and can be explained by a number of reasons. A recent study reported that COVID-19 is highly contagious, particularly with the latest variant of Omicron, and patients can be asymptomatic.[25] In addition, nurses and healthcare assistants fear contagion, as they are the medical staff who are the first point of contact for patients in primary care clinics before they are seen by doctors. Some patients may be asymptomatic but test positive for COVID-19. Conversely, medical laboratory professionals must perform blood test analyses, increasing their risk of contracting the disease. Owing to the occupational level of daily exposure to patients with COVID-19, some HCPs succumb to this disease. HCPs also fear that their daily exposure could put their family members at risk, especially during the quarantine period owing to close contact history with patients.[24]

Our study also showed that the respondents with underlying chronic diseases had higher levels of fear of COVID-19. This result is consistent with the report by Al-Rahimi et al.[23] and can be explained by health anxiety. For instance, patients with chronic diseases such as ischaemic heart disease, diabetes or hypertension are at risk of developing complications and succumbing to this disease.[26]

Herein, higher exposure to COVID-19 (P<0.001), worry about self at work (P=0.001) and worry about mortality from COVID-19 (P<0.001) were significantly associated with higher levels of fear. This finding is supported by a previous report showing that individuals with higher exposure to COVID-19 were most likely to contract COVID-19 and experience greater psychological distress, leading to fear.[19] Further, individuals with higher exposure to COVID-19 may also become a source of infection for those around them, including their family members, colleagues and friends.[27]

The level of fear towards COVID-19 was inversely correlated with a higher work-related stress management score in the present study (P<0.001). This finding is consistent with that reported by Sun et al. on self-efficacy in coping with stress amid the pandemic.[28] Owing to the heavy burden and fear of contagion that HCPs face, it is important for HCPs to believe in their ability to manage work-related stress to overcome the psychology behind the overwhelming and high-risk work during the pandemic.[28]

Our study also reported that the level of fear towards COVID-19 was inversely correlated with a higher sleep quality score (P<0.001). This finding agrees with that reported by Bilgic et al. among nurses.[29] The authors reported that nurses with a poor sleep quality showed high levels of stress during the pandemic.[29] Accordingly, a good sleep quality can be concluded to be associated with lower levels of fear. However, we observed negative associations in our study. Female sex was not associated with fear, contradicting the findings of two other studies[5,18] but agreeing with those of another local study.[19] In this study, the female HCPs showed higher levels of fear in the bivariate analysis than did the male HCPs, but not significantly after adjustments for all confounders in the multiple linear regression. This finding can be explained by the fact that almost half of the respondents were nurses (47.4%), suggesting that the high proportion of nurses in the sample might have influenced the overall fear scores. It is plausible that the nature of their profession, exposure to stressful situations or specific training in dealing with fear and anxiety could have contributed to the higher fear scores among the nurse respondents. Consequently, the strong influence of the nurses in the statistical analysis could have masked the association between sex and fear, leading to the non-significant difference observed in the multiple linear regression analysis.

To the best of our knowledge, this study is the first to determine the factors associated with fear among primary healthcare workers in Malaysia. In addition, the sample size of the study is relatively larger than that of other local studies on psychological distress among HCPs.[19,30] However, we could neither establish any causal relationship with fear owing to the cross-sectional study design nor conclude on the generalisability of the findings, as the study was not conducted nationwide. Another limitation is the potential impact of selection bias owing to the online survey method used. Furthermore,

fear is a subjective unpleasant emotion in response to the perception of threats and highly correlated with mental disorders, personality, social issue and genetic factors. A full assessment of concerns and predictors related to COVID-19 is not within the scope of this study. Thus, caution must be taken when interpreting the results in the context of the limitations.

The implication of this study is to add value in the literature in this field by providing knowledge on the factors associated with fear among HCPs and serving as a platform for future interventions tailored to the findings of this study. Based on our findings, the risk of exposure to COVID-19 may be reduced by establishing strict SOP and providing adequate PPE and vaccination boosters to all HCPs. Family medicine specialists also need to allocate clinical tasks to HCPs in rotations and based on their health status. Further, it is essential to set up mental health support groups in primary care clinics for staff to handle stress, poor quality of sleep and anxiety. The present findings also suggest early detection and timely screening of the mental health status of HCPs in health clinics. With these efforts, early referral to relevant HCPs for further management can be initiated.

Conclusion

In conclusion, work as nurses, medical laboratory workers and healthcare assistants is identified as a predictor of fear likely owing to the direct and high-risk exposure to patients with COVID-19. Underlying chronic diseases are also associated with higher levels of fear, reflecting health anxiety related to the potential complications of COVID-19. Furthermore, increased exposure to COVID-19, worries about self at work and mortality and poor stress management and sleep quality are related to higher levels of fear. Conversely, sex is not significantly associated with fear possibly owing to the predominant representation of nurses in the study sample. Randomised studies are recommended to obtain more comprehensive results for reducing fear and other psychological distress among HCPs.

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Author contributions

CSM, CAT, AY, TR, LPY and IZI involved in the study design, NMM, HBK, NJY, TSF, ZZZ, SRJ and SWT involved in data collection, CSM, NJY and LKW performed the statistical analysis and drafted manuscript. All authors read and approved the final manuscript.

Ethical approval

Ethical approval for this study was obtained from the Medical Research and Ethics Committee, Ministry of Health Malaysia (NMRR ID-21-02084-IUO [IIR]).

Conflicts of interest

All authors declare no conflicts of interest.

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Data sharing statement

Data will be held by the principal investigator. Requests for access can be made to the principal investigator.

How does this paper make a difference in general practice?

- This study examined the determinants of fear towards COVID-19 among primary healthcare providers in various aspects including sociodemographic characteristics and occupational factors.
- This study involved primary healthcare providers who are seldom focussed on such as medical laboratory technicians, drivers and medical assistants.
- The determinants of fear could be used to identify healthcare providers at risk of experiencing COVID-19-related fear to initiate referral for early mental health interventions.

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