ORIGINAL ARTICLE

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Prevalence of burnout among healthcare professionals in Singapore

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ABSTRACT

Introduction: The aim was to study the prevalence of burnout among various groups of healthcare professionals in Singapore.

Methods: An anonymous online survey questionnaire was conducted using the Maslach Burnout Inventory - Human Services to measure three categories of burnout: emotional exhaustion (EE), depersonalisation (DP) and personal accomplishment (PA) from July 2019 to January 2020 in a healthcare cluster in Singapore.

Results: The survey was completed by 6,048 healthcare professionals out of a target survey population of 15,000 (response rate 40.3%). The study revealed 37.8% of respondents had high EE score ≥27, 29.7% of respondents had high DP score ≥10, and 55.3% of respondents had low PA score ≤33. Respondents with either high EE score or high DP score constituted 43.9% (n=2,654).

The Allied Health group had the highest mean EE score, which was significantly higher than those of Medical, Nursing and Non-clinical groups (P<0.05). The Medical group had the highest mean DP score and this was significantly higher than the Nursing, Allied Health and Non-clinical groups (P<0.05). The Non-clinical group had the lowest PA, which was significantly lower than the Medical, Nursing and Allied Health groups (P<0.005).

Conclusion: There was high prevalence of burnout among healthcare professionals in Singapore, especially the allied health professionals. There were significant differences in the 3 categories of burnout (EE, DP and PA) among the different groups of healthcare professionals. There is an urgent need to address the high burnout rate.

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Keywords: Depersonalisation, emotional exhaustion, Maslach Burnout Inventory, patient safety, personal accomplishment

INTRODUCTION

Burnout was first described in 1974 by Herbert Freudenberger, where he discussed the concept based on physical signs, behavioural indicators, judgment, emotional factors, and the preventive measures to avoid burnout.[1] In 2019, the World Health Organization defined burnout as an occupational phenomenon in the International Classification of Diseases 11th revision (ICD-11), recognising burnout as a serious health issue.

The evolving healthcare landscape, new diseases and technologies, and rapid shifts they bring, coupled with limited resources, have resulted in accelerated challenges for healthcare professionals. Studies on burnout found significant association between burnout of healthcare professionals and patient safety; and poor well-being was linked to poorer patient safety.[2] Burnout was one of the key contributing factors to medical errors and burnout risked patient care.[1-5]

There has been increasing focus on burnout in healthcare. A review of global literature in 2019 showed an overall aggregate prevalence of burnout of 51.0% among medical and surgical residents. Another review of 61 studies comprising 45,539 nurses worldwide in 49 countries across multiple specialties showed an

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CLINICAL IMPACT

What is New

- To our knowledge, this is the first study to assess and compare burnout level of healthcare professional groups in Singapore.
- There was high prevalence of burnout among healthcare professional groups with significant differences in the 3 burnout categories: emotional exhaustion, depersonalisation and personal accomplishment.

Clinical Implications

- The study supports the need to address burnout of all healthcare professional groups.
- The data help to guide policy and efforts to improve the burnout of healthcare professionals.

overall pooled-prevalence of burnout symptoms of 11.2%.[3,4] The Medscape National Physician Burnout and Suicide survey in 2020 reported a burnout rate of about 43%.[5]

In Singapore, there were few studies on the prevalence of burnout. One study was on empathy and burnout among residents from a Singapore institution and another local study was on the association of demographics and personality factors with burnout among nurses in a Singapore tertiary hospital.[6,7] However, there was no study on burnout across different groups of healthcare professionals in Singapore. The Resilience in Academic Medicine (RAM) Survey was launched in July 2019. The Maslach Burnout Inventory - Human Services (MBI-HSS) was used to assess the burnout level of healthcare professionals in Singapore Health Services, the largest healthcare cluster in Singapore.

METHODS

Survey

The survey was conducted over a period of 6 months from 18 July 2019 to 24 January 2020. The questionnaire was circulated to staff with corporate email accounts, and hard copy was provided upon request. The target survey population was set at 15,000 staff. The staff are categorised into 4 groups: Medical (doctors), Nursing (nurses), Allied Health (pharmacists and allied health professionals) and Non-clinical (healthcare administrators, ancillary staff and researchers).

Survey instruments

Demographics

Demographics of respondents such as age group, profession, medical rank (if profession is medical) and years of working experience were collected as part of this study.

Burnout

We used the MBI-HSS, a validated tool for measuring burnout.[8] It is designed for professionals in the human service settings with direct contact with recipients, which in our settings, applies to patients, caregivers or colleagues. MBI comprises 3 scales: the emotional exhaustion (EE) scale measures feelings of being emotionally overextended and exhausted by one's work; the depersonalisation (DP) scale measures an unfeeling and impersonal response towards the recipients of one's service, care treatment or instruction; and the scale on personal accomplishment (PA) determines feelings of competence and successful achievement in one's work. Each scale consists of multiple questionnaires over a 7-point Likert scale from 0 (never) to 6 (every day) to assess frequency of the feeling that the respondent has experienced related to the scale. Each scale is scored individually and interpreted separately. The scales are not aggregated, and as with most published studies that used the MBI tool, we adopt the following as cut-off levels for the respective scores for burnout: EE score $\geq$27 (high), DP score $\geq$10 (high) or PA score $\leq$33 (low).[9]

Survey platforms

The online survey was hosted on our Cluster's secure intranet and internet platforms. Hard copy printed surveys were provided upon request. Electronic publicity banners and email announcements with invitation links were regularly communicated and circulated.

Statistical analysis

The survey responses were tabulated and scored according to MBI tool scoring criteria.[8] The scores were analysed using the SPSS Statistics version 26 (IBM Corp, Armonk, US). One-way analysis of variance (ANOVA) was performed to compare the mean scores for burnout level among the different healthcare professional groups. A Least Significant Difference method was used for multiple comparisons if there was significant difference among groups. Two-sample t-tests were used to examine the relationship between the house officer (HO)/postgraduate year 1 (PGY1) and

the various medical rank group in EE, DP and PA high burnout state. Logistic regression analysis was also conducted to determine the association of profession groups with the 3 components of burnout, EE, DP and PA. The odds ratios (ORs) and their 95% confidence intervals (CIs) were calculated. A *P* value <0.05 was considered statistically significant.

Ethical consideration

The study was reviewed and granted exemption by the Singapore Health Services Centralised Institutional Review Board under the category of Anonymous Educational Tests, Surveys, Interviews or Observation. The healthcare staff were informed about the purpose of the study through the various publicity platforms and at the start of the survey. The study respondents were also assured of confidentiality, with data kept anonymous throughout the study process.

RESULTS

Respondents

The target survey population was set at 15,000 healthcare staff from the Cluster, and were distributed across 8 professional groups based on the Cluster staff strength. For comparison purposes, we combined them into 4 main groups: Medical (medical and dentistry), Nursing, Allied Health (allied health and pharmacy), and Non-clinical (administrator, ancillary and researcher). The proportion of the sampled population among these 4 groups were: Medical 8.3% (1,239), Nursing 39.3% (5,893), Allied Health 14.8% (2,216) and Non-clinical 37.7% (5,652). We obtained a mean participation rate of 40.3%, where 6,048 staff out of 15,000 took part in the survey with 608 (49.1%) Medical staff; 3,032 (51.5%) Nursing staff; 764 (34.5%) Allied Health staff; and 1,644 (29.1%) Non-clinical staff.

Out of the 6,048 survey respondents, 10.1% (608) were from Medical, 50.1% (3,032) Nursing, 12.6% (764) Allied Health and 27.2% (1,644) Non-clinical group. Among the survey respondents, 83.1% (5,024) were female, 55.6% (3,361) were married and 48.4% (2,928) were parents. Further stratification showed 31.9% (1,928) were caregivers taking care of young children less than 7 years old or elderly or disabled family members, and 46.3% (2,803) were in the healthcare industry for more than 10 years (Table 1).

Burnout levels

The mean score for EE was 23.2 (standard deviation [SD] 13.0), for DP was 7.2 (SD 6.5) and for PA was 31.3 (SD 9.5). Our study showed that 37.8% (2,284) of respondents had high score for EE, 29.7% (1,796) had high score for DP, and 55.3% (3,342) had low score for PA (Table 2).

EE score for Allied Health group (mean 25.3, SD 12.9) was significantly higher than the Medical (mean 23.7, SD 12.8), Nursing (mean 23.7, SD 13.1) and Non-clinical (mean 21.1, SD 12.7) (all P values <0.05) groups (Table 2). DP score for the Medical group (mean 8.7, SD 7.1) was significantly higher than Nursing (mean 7.4, SD 6.6), Allied Health (mean 7.9, SD 6.7) and Non-clinical (mean 6.2, SD 5.7) groups (all *P* values <0.05) (Table 2). PA score for Non-clinical group (mean 29.0, SD 9.8) was significantly lower than the Medical (mean 33.9, SD 8.6), Nursing (mean 31.6, SD 9.5) and Allied Health (mean 32.7, SD 8.6) groups (all *P* values <0.05) (Table 2).

In the study, 71.3% of survey respondents (4,310 of 6,048) experienced high burnout score in at least 1 of the categories, while 35.3% (2,134 of 6,048) had high burnout scores in at least 2 of the categories, and 16.2% (978 of 6,048) had high burnout scores across all 3 categories (Table 3). Allied Health had the highest percentage with either high EE or high DP score at 52.5% (401), followed by Medical 47.4% (288), Nursing 45.3% (1,372) and Non-clinical 36.1% (593) (Table 3).

Table 4 shows the risk analysis of burnout by profession using the Non-clinical group as the reference in logistic regression. The analysis was adjusted by sex, age group, ethnicity, marital status, taking care of family member, number of children, years of working, working place, smoking and alcohol consumption. Allied Health group (OR 1.76, 95% CI 1.44–2.15) had the highest risk of EE among the different professions, followed by Medical (OR 1.39, 95% CI 1.10–1.74) and Nursing (OR 1.26, 95% CI 1.07–1.49). DP was felt most by the Medical group (OR 1.99, 95% CI 1.57–2.53), followed by Nursing (OR 1.38, 95% CI 1.15–1.65) and Allied Health (OR 1.38, 95% CI 1.11–1.70). The Non-clinical group was observed with the highest risk of low PA, Non-clinical (OR 1, reference), followed by Nursing (OR 0.66, 95% CI 0.56–0.77), Allied Health (OR 0.53, 95% CI 0.44–0.64) and Medical (OR 0.43, 95% CI 0.35–0.54).

In our cohort, EE score in HO/PGY1 group (mean EE score 29.4, SD 15.2) was significantly higher than the senior consultant group. DP score in HO/PGY1 group (mean DP score 13.4, SD 8.7) was significantly higher than the consultant and senior consultant group. PA score in HO/PGY1 group (mean PA score 28.9, SD 11.8) was significantly lower than senior consultant group (Table 5).

Table 1. Survey demographic data

Variables	No.	%
	N=6,048	
Age group		
<20 years old	22	0.4
20–29 years old	1,597	26.4
30–39 years old	2,223	36.8
40–49 years old	1,152	19.0
50–59 years old	715	11.8
≥60 years old	339	5.6
Profession		
Administrator	1,000	16.5
Allied health	587	9.7
Ancillary	544	9.0
Dentistry	39	0.6
Medical	569	9.4
Nursing	3,032	50.1
Pharmacy	177	2.9
Researcher	100	1.7
Medical profession		
House officer/Postgraduate year 1	13	2.1
Medical officer	28	4.6
Resident/Senior resident	104	17.1
Clinical associate/Resident physician	35	5.8
Staff physician/Staff registrar	48	7.9
Associate consultant	49	8.1
Consultant	95	15.6
Senior consultant	180	29.6
Not specified	56	9.2
Total years of working experience as a healthcare professional		
<2 years	555	9.2
2–10 years	2,689	44.5
11–20 years	1,698	28.1
21–30 years	637	10.5
>30 years	468	7.7
Not specified	1	0
Years of experience with current institution		
<2 years	1,105	18.3
2–10 years	3,051	50.4
11–20 years	1,284	21.2
21–30 years	388	6.4
>30 years	219	3.6
Not specified	1	0

DISCUSSION

Our study showed that each of the professional groups in our healthcare cluster in Singapore experienced a considerable degree of burnout as manifested by high EE, DP and/or low PA. This relatively large survey done in the latter half of 2019 can serve as a baseline study for Singapore healthcare professionals.

A large study conducted on US physicians in 2014, involving 6,577 sampled physicians showed a mean EE score of 25.7 for the physicians.[10] In contrast, the mean EE score of all our 4 groups were lower (better)—Medical (23.7), Nursing (23.7), Allied Health (25.3) and Non-clinical groups (21.1). The same study showed a mean DP score of 8.1 of US physicians. While our Allied Health mean DP score (7.9), Nursing mean DP score (7.4) and Non-clinical mean DP score (6.2) groups were lower in comparison, our Medical group mean DP score (8.7) was higher (worse). The same study also showed that US physicians has a PA mean score of 40.0. In contrast, the mean PA score of our 4 groups were all lower (worse)—Medical (33.9), Nursing (31.6), Allied Health (32.7) and Non-clinical groups (29.0). While burnout rates were considerable and similar to US physicians in certain respects, it may be important to pay particular attention to the burnout categories of high DP and poor PA, beyond EE.

There are few studies that focused on the prevalence of burnout in allied health professionals. A recent study of pharmacy technicians in Singapore in the early part of 2020 revealed high levels of burnout.[11] The study showed a mean EE of 26.0, with 46.2% indicating a high EE; a mean DP of 8.0 with 31.9% indicating a high DP; and a mean PA of 31.0 with 53.7% indicating a low PA. Analysis of allied health group in our study (Table 2) showed a mean EE of 25.3 with 45.8% indicating high EE; a mean DP of 7.9 with 33.6% indicating high DP; and a mean PA of 32.7 with a high proportion of 50.4% indicating low PA. In contrast, a Canadian white paper on burnout among physiotherapists

Table 2. Maslach Burnout Inventory emotional exhaustion, depersonalisation and personal accomplishment by professional groups

	MBI EE			MBI DP			MBI PA		
	High EE (MBI≥27)			High DP (MBI≥10)			Low PA (MBI≤33)		
Profession	Burnout level Mean (SD)	*P* value compared with Allied Health	High burnout No. (%)	Burnout level Mean (SD)	*P* value compared with Medical	High burnout No. (%)	Burnout level Mean (SD)	*P* value compared with Non-clinical	Low PA No. (%)
Medical n=608	23.7 (12.8)	0.028	227 (37.3)	8.7 (7.1)	-	230 (37.8)	33.9 (8.6)	<0.001	259 (42.6)
Nursing n=3,032	23.7 (13.1)	0.004	1,194 (39.4)	7.4 (6.6)	<0.001	928 (30.6)	31.6 (9.5)	<0.001	1,641 (54.1)
Allied Health n=764	25.3 (12.9)	-	350 (45.8)	7.9 (6.7)	0.031	257 (33.6)	32.7 (8.6)	<0.001	385 (50.4)
Non-clinical n=1,644	21.1 (12.7)	<0.001	513 (31.2)	6.2 (5.7)	<0.001	381 (23.2)	29.0 (9.8)	-	1,057 (64.3)
Total N=6,048	23.2 (13.0)	-	2,284 (37.8)	7.2 (6.5)	-	1,796 (29.7)	31.3 (9.5)	-	3,342 (55.3)

DP: depersonalisation; EE: emotional exhaustion; MBI: Maslach Burnout Inventory; PA: personal accomplishment; SD: standard deviation

reported 37.3% high EE, 9.5% high DP and 17.4% low PA among their subjects, which were lower, especially for the PA category, compared to our allied health group.[12]

Our study revealed high risk of burnout (high EE, high DP or low PA) experienced by the healthcare workforce of our Singapore cluster. A study in Singapore that evaluated the factors associated with health-related quality of life in the working population showed that 92.0% of workforce in Singapore reported being stress at work, which is well above the global average of 84.0%.[13] With Singapore's rapid industrialisation and economic growth, the pressure for the workforce to meet higher expectations for productivity and efficiency is inevitable.[13] Consequently, the degree of work-related stress and burnout, if left unchanged, will get worse overtime as evidenced by many research studies and reports.[1-5,8,9,11-21]

Our study revealed the disparity of burnout components experienced by each of the 4 groups examined. Medical, Nursing and Allied Health groups were found to have significantly higher rates of burnout in EE and DP domains compared to Non-clinical group. Studies had shown that high empathy was significantly associated with less burnout.[6,22] Empathy training may help staff improve their interpersonal and relationship-building skills for patient care and may assist with increased job satisfaction, which may lead to reductions in stress and burnout.[23,24] On the other hand, Non-clinical staff had significantly higher rates of burnout in the PA domain (a very high rate of poor personal accomplishment at 64.5%). The causes of these findings are likely multifactorial. One possible explanation is the job scope of clinical staff involving meaningful engagement in patient care (and thus gaining personal accomplishment), which may be protective against burnout for the PA domain; on the other hand, the chances of direct engagement with patients for non-clinical staff are much less.

In our study, all 3 categories of EE, DP and PA showed HO/PGY1 scores significantly higher than the senior consultant group. Possible explanations include longer working hours, night shift experience, lack of familiarity from regular department rotations, and insufficient support at home and work, leading to work stress among junior doctors. Lower (better) EE and DP, and higher (better) PA scores among the senior consultants may be skewed by those who had left our public health cluster system in recent years. This is consistent with other studies, which showed that years of experience and other demographic factors do influence burnout.[10,25] Studies can be undertaken to elucidate this issue further.

Table 3. Prevalence of high burnout across MBI category combinations

	Prevalence of high burnout (High EE, High DP, Low PA)			
Profession	**At least 1 No. (%)**	**At least 2 No. (%)**	**All 3 No. (%)**	**High EE or high DP No. (%)**
Medical n=608	377 (62.0)	229 (37.7)	110 (18.1)	288 (47.4)
Nursing n=3,302	2,163 (71.3)	1,092 (36.0)	508 (16.8)	1,372 (45.3)
Allied Health n=764	545 (71.3)	308 (40.3)	139 (18.2)	401 (52.5)
Non-clinical n=1,644	1,225 (74.5)	505 (30.7)	221 (13.4)	593 (36.1)
Total N=6,048	4,310 (71.3)	2,134 (35.3)	978 (16.2)	2,654 (43.9)

DP: depersonalisation; EE: emotional exhaustion; MBI: Maslach Burnout Inventory; PA: personal accomplishment

Table 4. Risk analysis of burnout by profession (logistic regression)

Profession	**N=6,048**	**EE≥27**	**DP≥10**	**PA≤33**
		Adjusted OR (95% CI) [a]	**Adjusted OR (95% CI)** [a]	**Adjusted OR (95% CI)** [a]
Nursing	3,032	1.26 (1.07–1.49)	1.38 (1.15–1.65)	0.66 (0.56–0.77)
Medical	608	1.39 (1.10–1.74)	1.99 (1.57–2.53)	0.43 (0.35–0.54)
Allied Health	764	1.76 (1.44–2.15)	1.38 (1.11–1.70)	0.53 (0.44–0.64)
Non-clinical	1,644	Ref	Ref	Ref

CI: confidence interval; DP: depersonalisation; EE: emotional exhaustion; MBI: Maslach Burnout Inventory; OR: odds ratio; PA: personal accomplishment

[a] Adjusted by sex, age group, ethnicity, marital status, taking care of family member, number of children, years of working, working place, smoking and alcohol consumption

In terms of the prevalence of high burnout, 71.3% experienced high burnout score in at least 1 of the 3 categories, while 35.3% had high burnout scores in at least 2 categories, and 16.2% (978 of 6,048) had high burnout scores across all 3 categories. Of these 978 respondents, 52.2% were single (511), 39.8% (389) aged 30–39 years old and 34.6% (338) had worked in the Cluster for 2–5 years. Healthcare professionals with less than 5 years of work experience tend to experience more burnout, which could be attributed to the fact that with more years of work experience, the coping of job demands could be better managed. However, an in-depth study on the demographic factors associated with burnout is needed to determine their roles in influencing burnout.

There are many studies that defined burnout level as self-reported combination of high EE and/or DP scales.[26,27] A study on factors associated with self-reported burnout level in allied healthcare professionals in a tertiary hospital in Singapore showed a burnout prevalence level (high EE and/or high DP) of 67.4%.[26,27] In our survey of all groups of healthcare professionals, 43.9% had high EE and/or high DP, of which 37.8% had high EE and 29.7% had high DP. Our sub-analysis of the group of our allied health professionals showed a very high burnout prevalence level (high EE and/or high DP) of 52.5%, which was the highest compared to the other professional groups, namely, Medical (47.4%), Nursing (45.3%) and Non-clinical groups (36.1%).

It is essential to look at strategies on creating joy at work that can sustain choice and autonomy, meaning and purpose, camaraderie and teamwork, physical and psychological safety, resilience and wellness, thereby improving burnout.[18-20] Adopting and implementing the right interventions are crucial in reducing burnout and enhancing resilience for patient safety and healthcare worker safety.[15-17]

There are limitations in this study when reviewing the results. Some in our study population were concerned about being identified as some survey questions may be personal to them. Although the survey was carried out without collecting respondents' identities, some may not have proceeded with the survey due to relatively detailed demographic information collected in this study. In

Table 5. Maslach Burnout Inventory emotional exhaustion (EE), depersonalisation (DP) and personal accomplishment (PA) by medical rank

	MBI EE			MBI DP			MBI PA		
	High EE (MBI≥27)			High DP (MBI≥10)			Low PA (MBI≤33)		
Medical rank	**Burnout level Mean (SD)**	***P* value compared with HO/ PGY1**	**High burnout No. (%)**	**Burnout level Mean (SD)**	***P* value compared with HO/ PGY1**	**High burnout No. (%)**	**Burnout level Mean (SD)**	***P* value compared with HO/ PGY1**	**Low PA No. (%)**
House officer/postgraduate year 1 n=13	29.4 (15.2)	-	7 (53.8)	13.4 (8.7)	-	7 (53.8)	28.9 (11.8)	-	8 (61.5)
Medical officer n=28	30.3 (14.9)	0.859	15 (53.6)	13.0 (8.5)	0.904	17 (60.7)	31.8 (9.0)	0.395	14 (50.0)
Resident/Senior resident n=104	25.2 (12.8)	0.283	45 (43.3)	10.1 (7.7)	0.154	46 (44.2)	34.1 (8.7)	0.054	44 (42.3)
Clinical associate/ Resident physician n=35	23.2 (10.8)	0.123	14 (40.0)	9.5 (7.0)	0.116	16 (45.7)	33.4 (7.9)	0.133	15 (42.9)
Staff physician/Staff registrar n=48	24.4 (13.3)	0.245	18 (37.5)	9.0 (7.4)	0.071	21 (43.8)	34.6 (8.5)	0.055	17 (35.4)
Associate consultant n=49	24.8 (10.8)	0.213	18 (36.7)	9.4 (6.9)	0.084	20 (40.8)	33.3 (6.7)	0.083	24 (49.0)
Consultant n=95	25.2 (12.2)	0.258	39 (41.1)	9.0 (7.0)	0.041	35 (36.8)	33.0 (9.1)	0.148	43 (45.3)
Senior consultant n=180	19.9 (12.4)	0.009	48 (26.7)	6.2 (5.8)	<0.001	43 (23.9)	34.7 (8.9)	0.028	69 (38.3)
Total n=552 [a]	23.6 (12.7)	-	204 (37.0)	8.7 (7.2)	-	205 (37.1)	33.8 (8.7)	-	234 (42.4)

DP: depersonalisation; EE: emotional exhaustion; HO/PGY1: house officer/postgraduate year 1; MBI: Maslach Burnout Inventory; PA: personal accomplishment; SD: standard deviation

[a] 552 excludes those without specification of their ranks (17) and dental surgeons (39)

addition, there were several surveys running throughout the year and some respondents were facing "survey fatigue", hence affecting the participation rate (40.3%) of this survey. To the best of our knowledge, this study had the largest sample size of 6,048 participants, when compared to all other similar studies in Singapore. Previous papers in Singapore were all below 400 in participants' responses except for one with 1,830 responses.[7,28-30] Our survey was also done just before the COVID-19 pandemic and we have thus been able to compare our findings with previous studies.

CONCLUSION

This study provided an understanding of the burnout status among healthcare professionals in a Singapore healthcare cluster. There was high prevalence of burnout, especially for the allied health professionals. There were also significant differences in the 3 categories of burnout (emotional exhaustion, depersonalisation and personal accomplishment) among the different groups of healthcare professionals. There is a need for an effective national strategy to tackle the high burnout level of healthcare professionals in Singapore.

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