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Resilience and Emotions of Frontline Obstetrics and Gynaecology Healthcare Workers During the Novel Coronavirus-2019 (COVID-19) Pandemic: Cross-sectional Retrospective Descriptive Study

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Abstract

Objective: To explore impact of COVID-19 outbreak on resilience and emotions of frontline healthcare workers (HCW) during the pandemic Design: Cross-sectional retrospective descriptive study Setting: KK Women and Children's Hospital, Singapore, Department of Obstetrics and Gynaecology, between 7 February to 30 April 2020 Population: One hundred and one (101) HCW who worked in COVID-19 screening facilities and wards Methods: The participants were given a survey designed to understand their emotions when caring for patients with suspected or confirmed COVID-19, and how their various aspects of health were affected. The Brief Resilience Scale (BRS) was used to evaluate their resilience. Results: Normal resilience scores were found in 72.6% of HCW, 11.3% had high resilience scores while 16.1% had low resilience scores. Doctors had higher resilience scores than nurses (3.8 vs 3.3, p-value 0.017). HCWs perceived their mental health was most affected, followed by social and physical health as a result of COVID-19 related work. The main stressors faced were related to their personal safety and that of their family. A positive attitude at work with good teamwork, time away from routine clinical work and appreciation received helped to relieve the emotional and psychological stress faced. Conclusion: It is essential to explore appropriate interventions for HCW with low resilience to better assist the coping mechanism during this pandemic. Stressors identified and feedback received through this study are useful for implementing supportive workforce resources during an infectious disease outbreak.

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Running title: Resilience and emotions of HCW during COVID-19

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Abstract

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Methods: The participants were given a survey designed to understand their emotions when caring for patients with suspected or confirmed COVID-19, and how their various aspects of health were affected. The Brief Resilience Scale (BRS) was used to evaluate their resilience.

Results : Normal resilience scores were found in 76.3% of HCW, 11.3% had high resilience scores while 12.4% had low resilience scores. Doctors had higher resilience scores than nurses (3.8 vs 3.3, p-value 0.017). HCWs perceived their mental health was most affected, followed by social and physical health as a result of COVID-19 related work. The main stressors faced were related to their personal safety and that of their family. A positive attitude at work with good teamwork, time away from routine clinical work and appreciation received helped to relieve the emotional and psychological stress faced.

Conclusion: It is essential to explore appropriate interventions for HCW with low resilience to better assist the coping mechanism during this pandemic. Stressors identified and feedback received through this study are useful for implementing supportive workforce resources during an infectious disease outbreak.

Keywords: COVID-19, Resilience, Emotions, Healthcare workers, Obstetrics and Gynaecology

Tweet: Are our Obstetrics and Gynaecological healthcare workers coping during the COVID-19 outbreak? How can we help?

Word count: 236

Introduction

Singapore was one of the earliest countries affected the Novel Coronavirus-2019 (COVID-19) outbreak. In times of infectious disease outbreak, the country utilizes the 'Disease Outbreak Response System Condition' (DORSCON), a colour-coded framework to show the current disease condition. On 7th February 2020, the Ministry of Health in Singapore stepped up its alert level from Yellow to Orange – signifying that the disease is severe and spreads easily from person to person, although the disease is being contained[1].

Following the escalation to DORSCON Orange, the Department of Obstetrics and Gynaecology at KK Women's and Children's Hospital, the largest women's hospital in Singapore, which delivers more than 11000 babies annually, established isolation teams consisting of dedicated doctors and nurses assigned to

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care for patients with suspected or confirmed COVID-19 infection following screening at triage and during admission to hospital. Each team comprised of two doctors (one registrar and one medical officer) and between one to two nurses dependent on patient volume per shift. Two teams were on-site at all times, caring for two main clinical areas; the labour ward and urgent obstetrics and gynaecology centre (UOGC) which provides combined emergency gynaecology and early pregnancy care while additionally caring for isolated ward patients. These teams rotated on 12-hour shifts, over seven consecutive days and segregated themselves from other colleagues and clinical areas.

Healthcare workers (HCW) face intense demands daily, from arduous shifts to constant pressure to perform, and increasing levels of responsibility. It is unsurprising that HCW experience a higher prevalence of burnout than the general population. This psychological pressure and emotional stress among HCW appeared to be heightened during a pandemic, as seen from studies conducted following the outbreak of severe acute respiratory syndrome (SARS) in 2003[2]. Burnout is a syndrome characterized by emotional exhaustion, depersonalization, and a diminished sense of personal achievement. Resilience, defined as the ability to adapt successfully in the face of trauma, adversity, tragedy, or significant threat, may be critical in helping to combat trainee and physician burnout[3]. Resilience building becomes critical especially in the face of COVID-19 pandemic. Understanding the emotional and psychological effects of working during the COVID-19 outbreak can improve the well-being of large numbers of HCW. Additionally, this information has wider relevance to health systems in planning for emerging infections and potential bioterrorism[2].

This study aims to explore the impact of COVID-19 outbreak on the resilience and emotions of frontline HCWs in obstetrics and gynaecology during this pandemic.

Methodology

This was a cross-sectional retrospective descriptive study involving doctors and nurses who were on isolation duty from 7 February to 30 April 2020. The Brief Resilience Scale (BRS) was used to evaluate resilience (S1). This self-rating questionnaire was developed by Smith et al. in 2008, to measure individuals' ability to bounce back or recover from stress[4]. This concise six-itemed questionnaire has been validated in many countries to be an accurate and reliable measure of resilience[5-7].

The BRS consists of six statements. Statements 1, 3, and 5 are positively worded, while statements 2, 4, and 6 are negatively worded. The BRS is scored by reverse coding items 2, 4, and 6 and finding the mean of the six statements. Study participants report how strongly they agree or disagree with the statements. The BRS score is calculated by dividing the total sum by the total number of questions answered. The BRS score is classified into 3 categories: low resilience (1.00-2.99), normal resilience (3.00-4.30) and high resilience (4.31-5.00).

Additional survey questions were added to (i) explore the emotions of HCW when caring for suspected or confirmed COVID-19 patients, (ii) identify factors that reduced stress and (iii) determine how they feel working in isolation teams has affected their health (S2). Participants could choose more than one option for selected questions. The questions and content in the survey were developed following discussion between study investigators and key departmental leaders. The survey was piloted on junior doctors to ensure ease of use and understanding prior to distribution to participants. All HCWs who completed isolation duties were invited to participate in this study. Survey responses were anonymous to ensure confidentiality.

Completed surveys were consolidated at the end of the study period. Incomplete surveys were excluded. The responses were transcribed into Microsoft Excel. The BRS mean was analysed with paired T-test and one-way analysis of variance (ANOVA) using IBM SPSS Statistics software version 22. The p-value of less than 0.05 was taken as statistically significant. The qualitative data was summarized into themes and categories. This study was approved by the SingHealth Centralised Institutional Review Board (CIRB), reference number 2020/2471.

Results

A total of 50 doctors and 51 nurses worked in the isolation team during the study period. Of the 101 HCW

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who received the survey, three did not return the survey and one had incomplete BRS, hence excluded. The response rate was 96.0% (97 out of 101 HCW). The respondents' age ranged from 21 to 60 years, with a mean age of 34 years ± 7.970. Their professional work experience ranged from 1 to 40 years (mean 9.3 years, ± 7.818).

As seen from Table 1, the mean BRS score of the respondents was 3.6 ± 0.664. The majority of respondents have normal resilience (76.3%), while the prevalence of low resilience was 11.3% and high resilience was 12.4%. There was no statistically significant difference in mean resilience scores when analysed by age (p=0.700) and years of experience (p=0.918). Doctors had statistically significantly higher BRS than nurses (mean 3.8 vs 3.4, p=0.003). Male HCW had significantly higher BRS scores than female HCW (mean 4.0 vs 3.5, p=0.043). Amongst the 49 doctors, there was no difference observed in BRS scores between male and female doctors (p=0.318). There were no male nurses in the study.

Out of the 97 respondents, 26 HCW (26.8%) reported positive attitudes when informed of their assigned isolation duties – 18 (18.6%) were excited, 7 (7.2%) were happy to start on their new duties, one (1.0%) volunteered and one felt ready (1.0%). On the other hand, 65% reported some form of negative feelings – including being worried (52.6%) or anxious (2.1%) and feeling angry (4.1%) or upset (1.0%). Twenty-five (25.8%) HCW were indifferent. Respondents were more often concerned for their families (88.8%) over themselves (62.9%) (Table 2).

During isolation duties, many respondents (out of 97) expressed negative emotions – 23.7% had low mood, 39.2% were anxious, 23.7% were irritable, 2.1% were angry and 3.1% were fearful. Nineteen (19.6%) HCW felt neutral and only a small proportion of HCW had positive emotions (6.2%) such as feeling cheerful, happy and motivated.

Three respondents refrained from responding to mental health issues. Half the respondents (47/94, 50.0%) felt that their mental health was the most affected during isolation duties, followed by social well-being (28/94, 29.8%) and lastly, physical health (19/94, 20.2%). HCW on isolation duties were instructed not to meet other colleagues in the hospital and to have less contact with family members. They reported less family time due to the 12-hour shift work for seven consecutive days. This impacted their social well-being and resulted in low mood.

When asked "What makes you happy during isolation duties", a total of 80 participants answered (Table 3). The most common response (32.5%) emphasised that supportive team members with good teamwork made their isolation duties more enjoyable: "Going through it with friends/colleagues", "Company of colleagues", "Teamwork and positivity is important", "Good team with nurses and doctors". Many of them (23.8%) appreciated the time away from routine clinical work: "No ward rounds, no clinic, no ward duties", "Able to have staff empowerment to do things that we don't usually/routinely do". There were also 22.5% of them who enjoyed the small acts or gifts of appreciation from the department, hospital and community: "Thanks from patient", "Being appreciated", "Care and concern from colleagues outside (of) iso(lation duties)". Some of the respondents also commented that the well-equipped negative pressure rooms gave them confidence in managing patients who were positive for COVID-19.

Respondents were concerned that junior doctors were placed at higher risk of infection compared to the rest of the department as they were at the very frontline of patient interaction and many were assigned multiple rotations in the isolation team over the course of the study period. There were also concerns regarding financial remuneration for the additional shifts and all leave were cancelled on very short notice.

Discussion

The COVID-19 pandemic is globally the most serious and prolonged medical crisis, with Singapore bearing the early brunt of the pandemic. Our study indicated that study participants had a normal mean BRS score. This was similar to the resilience of primary healthcare professionals from a systematic review done in New York[8]. The median BRS score was 3.6 and 11.3% of respondents reported low resilience. Nurses had significantly lower BRS score compared to doctors in our study (3.8 vs 3.4, p=0.003). This may be in

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part related to their graduate educational background. A cross-sectional study conducted among nurses in Singapore in 2018 found that there was a positive correlation between highest educational qualification and resilience level; nurses with a bachelor's or postgraduate degree were about three times more likely to be of moderate or high resilience compared to nurses with only a general nursing certificate[9].

Male HCW had higher resilience scores than female HCW in this study. While this may be confounded by the lack of males amongst nurses in this study, previous studies analysing factors affecting resilience did not demonstrate association between gender and resilience scores[8,10-12]. There was no association between age of HCW and years of working experience with resilience score. This was unlike that suggested in Balmer et al 2014 that resilience among police officers was negatively affected by increased rank, age and length of service. However, the difference in the nature of the work may explain the difference in factors affecting resilience[10].

In this study, respondents were generally more concerned regarding their family's health and safety compared to their own. This was similar to studies done in Taiwan and China during the SARS outbreak on HCW caring for SARS patients. Their main worries included fears of contracting SARs and transmitting SARS to their families, being negligent and endangering co-workers and patients[13,14]. In addition to the heightened fear during work, the long working hours affected most HCW mentally. The social isolation from colleagues and self-imposed isolation from family members affected their social wellbeing and increased mental stress.

Three main factors were identified in this study that made our staff happy during their isolation duties: 1) Good teamwork with reliable and efficient colleagues; 2) Time away from routine clinical work and 3) Appreciation from the department, community and patients. These factors were similarly being identified in Saudi Arabia during the MERS-CoV outbreak[15] and in Taiwan during the SARS outbreak[13]. At our hospital, we are fortunate to have sufficient provision of personal protective equipment (PPE) for all staff, right from the start of the outbreak, triaged according to task and exposure with clear clinical guidelines available on our hospital intranet and round-the-clock Infectious Disease (ID) specialists available over telephone, who were helpful and supportive. Concerns regarding sufficient PPE and equipment were unfortunately reported in other centres. This was found to be associated with higher HCW infections[16]. In our centre, we recognised that there would be concern regarding safety and hence staffs who are allocated isolation duties were prioritised for completion of PPE and PAPR training prior to commencing their isolation duties. This ethos continues till today where vaccination is offered to the HCWs over other population.

A study by Jens Klein et al conducted in Germany implied that interventions aimed at reducing psychosocial stress at work among clinicians could improve quality of healthcare[17]. Promotion of autonomy, provision of adequate support services, a cooperative work environment, and promotion of work-life balance, were possible interventions to reduce psychosocial stress at the organization level. At the same time, working overtime, inadequate rewards, high-perceived demands, and inefficiency at work should be reduced. At the individual level, the reduction of stressful workplace experience like over-commitment by stress prevention programs or other stress management interventions could be an option to increase personal well-being and stress coping methods. Studies suggested that social support at work, satisfying work relationships, and organizational trust were able to reduce symptoms of work stress and error frequency. Further possible interventions at the interpersonal level could address the improvement of leadership or provision of esteem reward and supervisory capacity. A reduction of formal hierarchies could promote social support as well. At the structural level, innovations in work organization, compensatory wage systems, or models of gain sharing could be implemented. Interventions on psychosocial work factors, addressing psychological demands, decision latitude, social support, and effort-reward-imbalance, for the different levels were effective in preventing mental health problems and improving working conditions in a hospital setting.

Limitations

This study utilises a self-designed eleven-domain survey form designed to assess the emotional and psychological stress. This survey is not standardized nor validated thus may limit its ability to reliably identify issues. As our department sees patients with suspected COVID-19 infection with only gynaecological or obstetrical

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issues, the overall psychological distress reflected in this paper may be underestimated when compared to physicians in the emergency department[18].

In addition, this study did not adjust for possible comorbidities among participants, which may affect their resilience and ability to handle additional stress and workload during a pandemic. Mealer M et al reported a significant negative relationship between resilience and mental disorders[19]. When comparing the intensive care unit HCW, those with high level of resilience had less post-traumatic stress disorder, anxiety symptoms and depression. As one in nine of our study respondents had low resilience scores, the department should develop ways to manage and follow up the potential long-term health issues that may affect HCW following the pandemic.

Moreover, resilience can be affected by numerous factors. The department has more female than male staff thus the comparison between gender may increase Type 1 error rates.

Conclusions

The COVID-19 pandemic has, beyond physical health, caused emotional distress among the frontline HCW. The resilience score, feelings of HCW, their perceived stressors, and coping strategies were similar to those in other studies. However, analysis from qualitative data helped identify key areas that healthcare institutions can engage in to improve HCW well-being.

It is evident that resilience is influenced by many factors other than the individual alone. Even though the overall resilience scores are in the normal range, 11.3% of the HCW had low resilience level. It is thus important to initiate intervention to prevent and plan provision of care for future mental health issues for our HCW. The main stressors relate to family and personal safety. Positive attitudes at work, healthy and happy work environments, support and recognition from the department and hospital, are key factors keeping HCW happy and productive in the workplace.

Acknowledging and recognising the workplace burdens suffered by HCW is vital to establishing supportive workforce resources during an infectious disease outbreak.

Declarations

Funding : There is no funding involved in this study

Conflict of interest : The authors report no conflict of interest. There was no financial support involved.

Ethics Approval : Ethical board approval for this study was obtained from the SingHealth Centralised Institutional Review Board (CIRB), with the reference number 2020/2471.

Contribution to Authorship

HLCQ: Project development, data collection and analysis, manuscript writing and editing

NNS & CSQM: Project conception, project development, data collection, manuscript writing and editing

JCSL: Project conception, project development, manuscript writing and editing, editorial guidance

SS: Project conception, project development, manuscript editing

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Table 1 Mean BRS based on the occupation, gender, years of experience and age among the study respondents

Variables	N	Min BRS	Max BRS	Mean BRS	SD	p-value	95% CI
Total	97	2.0	5.0	3.6	0.664		
Occupation*	Occupation*	Occupation*	Occupation*	Occupation*	Occupation*	0.003	0.139 – 0.653
Doctors	49	2.0	5.0	3.8	0.657		
Nurses	48	2.0	5.0	3.4	0.615		

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Variables	N	Min BRS	Max BRS	Mean BRS	SD	p-value	95% CI
Gender*	Gender*	Gender*	Gender*	Gender*	Gender*	0.043	0.0136-0.813
Male	12	2.0	5.0	4.0	0.788		
Female	51	2.0	5.0	3.5	0.633		
Amongst the doctors (n=49)*	Amongst the doctors (n=49)*	Amongst the doctors (n=49)*	Amongst the doctors (n=49)*			0.318	-0.219-0.659
Male	12	2.0	5.0	4.0	0.788		
Female	37	2.0	5.0	3.7	0.611		
Years of experienceˆ	Years of experienceˆ	Years of experienceˆ	Years of experienceˆ	Years of experienceˆ	Years of experienceˆ	0.918	
[?] 5	33	2.0	5.0	3.6	0.631		3.413-3.860
5.1-10	31	2.2	5.0	3.5	0.595		3.331-3.768
10.1-15	15	2.0	5.0	3.7	0.778		3.280-4.142
15.1-20	9	2.6	5.0	3.5	0.890		2.808-4.177
>20	7	2.7	4.5	3.6	0.639		3.056-4.238
Ageˆ	Ageˆ	Ageˆ	Ageˆ	Ageˆ	Ageˆ	0.700	
<30	31	2.0	5.0	3.6	0.114		3.413-3.879
30-40	44	2.2	5.0	3.6	0.0.99		3.408-3.808
>40	20	2.0	5.0	3.5	0.169		3.132-3.841

*Analysed via paired T-test

Table 2 Degree of concern for family and one's health during ISO duties

Degree of concern	**Family, n (%) (Total = 98)**	**Own Health, n (%) (Total = 97)**
Very concerned	44 (44.9)	19 (19.6)
Concerned	43 (43.9)	42 (43.3)
Neither concerned or unconcerned	5 (5.1)	24 (24.7)
Not very concerned	1 (1.0)	10 (10.3)
No concern at all	0 (0.0)	2 (2.1)
Not applicable	5 (5.1)	0 (0.0)

Table 3 Factors that make them happy during ISO duties , n=80

Factors	**Numbers (%)**
Good team work, supportive colleagues	26 (32.5)
Time away from routine clinical work	19 (23.8)
Appreciation from department and hospital, patients and the community	18 (22.5)
Break time	11 (13.8)
Patients recover/get deisolated	8 (10.0)
New experiences and skills learnt	4 (5.0)
Remuneration	3 (3.8)
Serving the country and community	3 (3.8)

Factors	Numbers (%)
Nothing	4 (5.0)

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