Cross-sectional Study

Triggering and protective factors of burnout in medical resident physicians in a lower-middle-income country: A cross-sectional study

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ABSTRACT

Background: Residents and interns are prone to emotional and physical exhaustion, also known as burnout. Burnout has not been studied much in physicians working in lower-middle income countries. We conducted this study to determine the burden of burnout among internal medicine residents and to identify triggering and protective factors associated with burnout.

Materials and methods: A cross-sectional study was conducted at two institutes in Karachi from 2018 to 2019. All residents registered in the internal medicine program for at least 6 months were invited to participate via an online survey. An abbreviated version of the Maslach Burnout scale was used to measure burnout, and protective and triggering factors were recorded according to known factors.

Results: A total of 71 out of 92 (77%) residents participated. The mean (SD) age of the participants was 28 (3.1) years, 51 (71.8%) were females and 51 (71.8%) were junior residents. A total of 33 (46.5%) residents had burnout. Burnout and emotional exhaustion were more in female residents (p < 0.05). None of the triggering factors attained statistical significance. The protective factors for burnout which showed significant association were good relationship with friends (OR 0.1 – 95% CI 0.0, 0.6), exercise and extra-curricular activities (OR 0.2 – 95% CI 0.0, 0.7), celebrating accomplishments (OR 0.2 – 95% CI 0.0, 0.7), having enough money (OR 0.2 – 95% CI 0.0, 0.4), and ability to plan for future (OR 0.1 – 95% CI 0.0, 0.6).

Conclusion: More than a third of medicine residents suffered from burnout. We need to focus on rejuvenating activities for medicine residents to decrease burnout among them. If not addressed adequately this may result in a compromise in the quality of care being provided to patients.

1. Introduction

The word ‘burnout’ was initially devised in 1974 by psychologist Herbert Freudenberger while discussing job satisfaction concerning work-related stress [1]. It is defined as a state of mental and physical exhaustion while performing work or caregiving activities. Maslach in 1993 further elaborated and categorized it as a troika of emotional exhaustion, depersonalization, and reduced personal accomplishment [2]. Over the years, the concept of burnout has gained quite a bit of popularity in the field of healthcare as the tough working environment and the intense schedule predispose clinicians to develop a significant degree of burnout [3]. However, studies on burnout on health care professionals from lower-middle-income countries focusing on its triggering and relieving factors are lacking [4].

Most physicians affected by burnout include either residents or interns as their training period involves quite a lot of interaction with different colleagues as well as complex decision-making and diagnostic dilemmas [1]. As per literature, approximately 50% of physicians are suffering from at least one symptom of burnout worldwide [5]. Burnout is associated with several negative and deleterious effects for the physician and the healthcare system. These can be varied in terms of decreased productivity and decreased job satisfaction and can even lead to severe depression for the physicians. Consequently, this can lead to poor patient care, increased length of stay, and major medical errors [5].
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Accreditation Council for Graduate Medical Education (ACGME) had recognized these epidemic levels of burnout and introduced the work-hour limit and directed the program directors to restructure the program for resident wellness [3]. Interestingly, there is no clear, well-demarcated mechanism for monitoring working hours of trainee physicians in Pakistan and unlike the United States, shift duties are less prevalent in most postgraduate programs. Numerous scales have been employed in identifying the level of burnout among physicians among which the Maslach burnout scale is the gold standard for assessment of burnout. It has been commonly used in many studies and evaluates burnout in terms of emotional exhaustion, depersonalization, and personal accomplishment [6]. However, the original Maslach burnout scale is quite long making it difficult to use. The Copenhagen Burnout inventory is another scale that assesses burnout based on questions related to three main domains including personal burnout, work-related burnout, and client/patient-related burnout. It is simpler and easy to comprehend by the respondents [7]. The gold standard so far for measurement of burnout is still the Maslach burnout scale and the abbreviated version (nine item form) is good enough to be used [6].

The factors driving a physician towards burnout are numerous and differ based on the department of work, the level of seniority, the sociocultural background, and the gender of the physician among many other factors. However, factors like working hours, financial support, lack of home life, time balance, and lack of autonomy are common in most studies [5,9,10].

Pakistan is a lower-middle-income country where there is no mechanism to monitor the work hours of residents or interns through any national-level licensing body, for example, the Pakistan Medical Commission. Hence, burnout in such countries often remains unnoticed [11]. Even though burnout has been extensively studied globally in the past five years’ data from our country is lacking especially for internal medicine. A review of literature has shown two recent studies published: one concerning various specialty [12] while the other focusing on gynecologists [13]. Considering the above discussion, burnout is not only prevalent but also has serious consequences. More importantly, most of the data reported on burnout is from high income countries and surgical residency programs, while studies on internal medicine are a decade old [14]. Internal medicine residents deal with the most complex medical patients who are most likely to code, thus they are more likely to suffer from burnout [15]. Hence, we need to explore the magnitude of burnout and the various factors that drive physicians into it. It might be more of a problem in our setting due to relatively different and labile living conditions. Therefore, we designed this study to determine the prevalence of burnout among internal medicine residents at two tertiary care hospitals in Karachi. Secondly, we want to determine the association of various factors with burnout in resident physicians from training centers from a lower-middle-income country.

2. Materials and methods

2.1. Study design

This was a cross-sectional study conducted among internal medicine residents of two private academic institutions in Karachi – Pakistan; Aga Khan University and Ziauddin University in 2018–2019. Both institutions are private tertiary hospitals but with different academic and service models. All residents of the internal medicine program at both institutes were invited to participate in the study via an online survey through google forms. Residents who were part of a flexible training program, working in shifts and those who had done less than six months of training were excluded. Participation in the study was completely voluntary and the data was anonymized through coding and kept confidential.

2.2. Data collection

The resident survey measured burnout using the Maslach Burnout Inventory (MBI). The MBI is a 22-item questionnaire and is a gold standard for measuring burnout and is known to be stable for up to a year [16]. However, we used the abbreviated version which is designed to ask respondents to rate the frequency of various experiences on a 7-point Likert scale ranging from never to daily [17]. The scores were measured across three domains: emotional exhaustion, depersonalization, and personal accomplishment. Scores of more than nine and six on emotional exhaustion or depersonalization respectively while a score of less than 12 for personal accomplishment was taken for burnout. All studies have shown that the abbreviated version of MBI is good enough for estimating burnout [8]. A person was considered to have burnout if at least two out of three subscales have abnormal scores i.e., emotional exhaustion or depersonalization are high, or lack of personal accomplishment is low. Though MBI is commonly used to measure burnout in resident physicians, some variability exists in interpreting MBI scores [18,19]. The survey also included the triggering and protective factors which were scored on a five-item Likert scale (1 = Does not apply 2 = minimally applies 3 = neutral 4 = moderately applies 5 = strongly applies). Demographic variables like age, gender, marital status, PGY level, accommodation status, and commute methods were also recorded. The study is compliant with the STROCSS criteria limited to cross-sectional study [20] (checklist attached separately).

2.3. Data analysis

All analysis was done via SPSS 22.0. Chi-square/Fisher exact test applied to determine the association between burnout and categorical variables and t-test to compare quantitative variables. A P value of less than 0.05 has been taken as significant. Logistic regression modeling performed, and odds ratio were calculated to find an association between various triggering and protective factors with burnout. 

2.4. Ethical considerations

Approval from the ethical review committee of both institutes was obtained before the start of the study (ERC No. 5135, Med ERC-17 from Ethical review committee, Aga Khan University and Ref No.0140318UGMED from Ethical review committee, Ziauddin University). The research has been appropriately registered at ClinicalTrials.gov (NCT04864002) [21].

3. Results

3.1. Demographics

A total of 92 residents were invited from both institutes to participate in the study, 71 responded to the online survey, giving a response rate of 77%. 54 (76%) were from Aga Khan University. Mean age was 28.3±3.1, 51 (71.8%) were female residents, 29 (40.8%) were married, 51 (71.8%) were of Level 1 and Level 2 in residency. Table 1 summarizes the demographics characteristics of burnout.

3.2. Burnout

Thirty three (46.5%) residents were found to have burnout. Subdomains in the Maslach burnout inventory are summarized in Table 2 about gender. Females were more significantly found to have emotional exhaustion (24 females to 4 males; p < 0.05) and burnout (28 females to 5 males; p < 0.05). On stratification of data according to the level of residency, burnout prevalence decreased with the increase in experience with 24.3% in year 2, 10% in year 3, and 8.6% in year 4 and 5. On subgroup analysis Level 2 physicians had higher burnout compared to the other levels of residency. Residents who had to use family cars were
found to have burnout although statistical significance was not seen (33.3%–7.9%; p-value 0.052).

### 3.3. Triggering and protective factors for burnout

The odds ratio was calculated to find the association between various triggering factors and burnout. No triggering factor was found to be statistically significant to cause burnout. However, few triggering factors showed a borderline association for burnout; conflicting responsibility between home and work (OR 1.3–95% CI 0.5, 3.5), guilt about not having enough time for family (OR 1.4–95% CI 0.5, 3.7), scheduling problem (OR 1.2–95% CI 0.5, 3.2), training issues (OR 1.2–95% CI 0.4, 3.3), childcare arrangements (OR 1.4–95% CI 0.4, 4.4). Other factors studied are mentioned in Table 3.

Factors that were protective towards getting burnout in internal medicine residents were, good relationship with friends (OR 0.1–95% CI 0.0, 0.6), exercise (OR 0.2–95% CI 0.0, 0.7), get-together with residents (OR 0.2–95% CI 0.1, 0.7), extra-curricular activities (OR 0.2–95% CI 0.0, 0.7), celebrating accomplishments (OR 0.2–95% CI 0.0, 0.7), supportive work environment (OR 0.3–95% CI 0.1, 0.9), having enough money (OR 0.2–95% CI 0.0, 0.4), and ability to plan for future (OR 0.1–95% CI 0.0, 0.6). Other factors studied are mentioned in Table 4.

### 4. Discussion

Our study is the first from Pakistan which has involved internal medicine residents from two tertiary care hospitals and academic centers and looks at the triggering and protective factors of burnout. The study uses a validated tool for measuring burnout and highlights the triggering and protective factors and is one of the first studies to be conducted on internal medicine residents at two different universities in this region.

Our study reports an estimated burnout prevalence of 46.5% among the resident physician of the two academic centers. It also highlights the fact that a lack of protective factors might play a stronger role in burnout rather than the presence of triggering factors. Some of the protective factors that help reducing burnout in residents’ physicians are having good support of friends at work, the ability to spend time out with friends, having enough money, and able to celebrate the

### Table 1

Demographics and residency level of residents overall, with burnout without burnout.

| Overall | Burnout Yes | Burnout No | p-value |
|---------|-------------|------------|---------|
| N (%)   | N (%)       | N (%)      |         |
| Mean (SD) Age | 28.3 (3.1) | 28.13 (3.2) | 28.50 (3.0) | 0.03 |
| Female Gender | 51(71.8) | 28(84) | 24(63.2) | 0.03 |
| Residency level |         |         |         |         |
| Level 1 | 21(29.6) | 13(40.6) | 8(21.1) | 0.22 |
| Level 2 | 30(42.3) | 13(49.6) | 17(44.7) |         |
| Level 3 | 9(12.7) | 2(6.3) | 7(18.4) |         |
| Level 4-5 | 10(14.1) | 4(12.5) | 6(15.8) |         |
| Married | 29(40.8) | 15 (45.5) | 14(36.8) | 0.31 |

| Accommodation status (residence) |         |         |         |         |
|----------------------------------|---------|---------|---------|---------|
| Without family | 21(29.6) | 10(30.3) | 11(28.9) | 0.55 |
| Primary hometown outside Karachi | 29(40.8) | 10(30.3) | 19(50.0) | 0.15 |
| Financial dependence | 24(33.8) | 10(30.3) | 14(36.8) | 0.37 |
| More than 3 dependents | 11(15.5) | 4(12.1) | 7(18.4) | 0.75 |
| Means of commute |         |         |         |         |
| Personal bike or car | 25(35.2) | 7(21.2) | 18(47.3) | 0.05 |
| Public transport | 21(29.6) | 10(30.3) | 11(28.9) |         |
| Family car | 14(19.7) | 11(33.3) | 3(7.9) |         |
| On foot commute | 11(15.5) | 5(15.2) | 6(15.8) |         |

| Table 2

Burnout in residents (overall, male, female).

| Overall | Male | Female | p-value |
|---------|------|--------|---------|
| N – 19 | N – 52 |         |         |
| Emotional exhaustion (EE > 9) | 28 | 4(21.1) | 24 | (46.2) | 0.04 |
| (39.4) | (23.9) |         |         |         |
| Depersonalization (Deper >6) | 17 | 4(21.1) | 13 | (25.0) | 0.49 |
| (97.2) | (94.7) |         |         |         |
| Lack of Personal accomplishment (Lack of PA <12) | 69 | 18 | 51 | 0.46 |
| (25(75.8) | 29(76.3) | 0.90 |
| Burnout | 33 | 5(26.3) | 28 | (53.8) | 0.03 |

| Table 3

OR triggering factors for burnout.

| Factors Burnout N (%) | No burnout N (%) | OR (95% CI) |
|-----------------------|------------------|-------------|
| Conflicting responsibility between home family and work | 20(60.6) | 20(52.6) | 1.3 |
| Difficult and complicated patients | 8(24.2) | 17(44.7) | 0.3 |
| Excessive paperwork | 21(63.6) | 28(73.7) | 0.6 |
| Guilt about never having enough time for family | 24(72.7) | 32(84.2) | 0.5 |
| Guilt about never having enough time for work | 14(42.4) | 13(34.2) | 1.4 |
| Difficulty staying organized | 10(30.3) | 13(34.2) | 0.8 |
| Difficulty staying on schedule | 14(42.4) | 14(36.8) | 1.2 |
| Too many work demands | 23(69.7) | 30(78.9) | 0.6 |
| Not enough time in the day | 21(63.6) | 32(84.2) | 0.3 |
| Depressed mood | 12(36.4) | 18(47.4) | 0.6 |
| Anxiety | 12(36.4) | 22(57.9) | 0.4 |
| Lack of sleep | 22(66.7) | 29(76.3) | 0.6 |
| Regret over chosen career | 4(12.1) | 5(13.2) | 0.9 |
| Lack of control over office y | 9(27.3) | 10(26.3) | 1.0 |
| Lack of control over my training | 12(36.4) | 12(31.6) | 1.2 |
| Poor control over my training | 11(33.3) | 13(34.2) | 0.9 |
| Poor relationships with colleagues | 3(9.1) | 4(10.5) | 0.8 |
| Family conflicts | 1(3.0) | 3(7.9) | 0.3 |
| Worry over childcare arrangements | 8(24.2) | 7(18.4) | 1.4 |
| Lack of control over schedule | 14(42.4) | 12(31.6) | 1.5 |
| Lack of time to exercise, take care of myself, and do things I enjoy | 25(75.8) | 29(76.3) | 0.9 |
| Boredom in my job | 11(33.3) | 12(31.6) | 1.0 |
| Lack of resources in my job | 9(27.3) | 15(39.5) | 0.5 |
| Lack of coping skills stress | 12(36.4) | 14(36.8) | 0.9 |
| Being a perfectionist | 9(27.3) | 14(36.8) | 0.6 |
| Being a pessimist | 3(9.1) | 8(21.1) | 0.3 |
| Lack of recognition of my accomplishments | 9(27.3) | 15(39.5) | 0.5 |
| Not having enough money | 16(48.5) | 22(57.9) | 0.6 |
| Lack of control over hospital processes | 16(48.5) | 21(55.3) | 0.7 |
were limited by the fact that no studies were looking at internal medi-
issues, and childcare arrangements. The study also showed that internal medicine residents had
cycles done in 2019 showed burnout in internal medicine residents around
46% which is similar to what has been reported in these meta-analyses,
33.1% [22]. The study also showed that internal medicine residents had
not having enough time for work, lack of control on scheduling, training
- accomplishment. The study reports borderline triggers for burnout
including conflicting responsibility between home and work, guilt about
not having enough time for work, lack of control on scheduling, training
issues, and childcare arrangements.
A systematic review and meta-analysis of 47 articles done in 2019
showed an overall burnout of 51% with high preponderance in Asian
countries [14]. However, internal medicine residents showed an even
higher percentage of burnout up to 57.1%. The study included 16 studies
related to internal medicine. However, the results of this meta-analysis
were limited by the fact that no studies were looking at Internal medi-
cine residents from an Asian country. Another study involving 26 arti-
cles done in 2019 showed burnout in internal medicine residents around
33.1% [22]. The study also showed that internal medicine residents had
the lowest personal accomplishment values. Our study shows burnout of
46% which is similar to what has been reported in these meta-analyses,
however, our study is primarily conducted in a lower-middle-income
country focusing on internal medicine residents in two academic setups.
These meta-analyses reported no statistical difference in burnout
between male and female residents suffering from burnout [14,22].
However, two studies have reported that burnout and depersonalization
are more likely to occur in men rather than women [23,24]. Similarly,
two studies have reported that burnout is more prevalent in females,
though one study did have an over-representation of females [25,26].
Our study has shown a female preponderance in burnout and emotional
exhaustion. This finding is in line with previous studies. It is also quite
consistent with the overall social and cultural norm in a South Asian
country like Pakistan, where most of the responsibility of the household
lies on the women and this becomes more challenging in the case of
working women [27,28]. Hence a woman who takes care of household
responsibilities and works in a hospital taking care of patients while
meeting her training needs is liable to get burnout easily.
Duty hours and the monthly number of calls are strongly associated
with burnout in a group of residents [29]. Campbell et al. reported
similar findings in their study where emotional exhaustion and burnout
decreased through the three years of residency. Nonetheless, there was
no significant change in scores of depersonalization and personal
accomplishment [23]. Almost all studies have shown that the prevalence
of burnout decreases with increased experience. Our study also showed
the same results, with subgroup analysis showing that level 2 physicians
had higher burnout compared to the other levels of residency. However,
there was no statistical significance. The major reason behind this is the
change in duty hours and the increase in clinical acumen to make the
required diagnostic decisions. A better understanding of this can be
achieved by performing a longitudinal study and following the same
residents for three to four years who were inducted in the first year of
residency.
A literature review has identified some major factors behind
increased burnout. These triggers include poor working conditions with
long work shifts, stressful call duties, lack of appreciation, and poor
social interactions [3]. These factors have also been stressed by Har-
iiharan et al. in their review that work-specific and person-specific de-
mands are the major factors behind burnout [9]. Solms et al. also
reported that increased workload, work-family conflict, and lack of
autonomy predispose residents to develop burnout [25]. The major
triggering factors identified in our study with borderline significance is
conflict between home and work and difficulty in staying on schedule.
Our study highlights that burnout is triggered by conflicting re-
sponsibility and training-related factors. The responsibilities at home
due to the joint family system or child care arrangement are more in the
physician population from low and lower-middle-income countries of
South Asian background as compared to high-income countries [30].
There is a possibility that rapid urbanization is gradually impairing the
social support system at homes [31]. This needs further research as on
one hand strong social support from joint family might help residents to
concentrate on their training while on the other hand, the same support
can also negatively impact the resident by imposing additional house-
hold demands.
Studies have also shown the impact of protective factors in reducing
burnout. Availability of personal resources, good colleague support, and
having psychological flexibility greatly helps in the prevention of
burnout [9,25]. Olson et al. has emphasized the importance of exercise
and physical activity by mentioning that increased body mass index was
associated with higher odds of burnout. However, he did not find any
significance in the protective effect of supportive relationships [32]. Our
study also underlines the significance of good family and friend support,
a supportive working environment, and physical activity to prevent
burnout. We also think that friendship in our part of the world is more
likely to be of the same gender. Our study also highlights the importance
of residents get together and the significance of celebrating and getting
acknowledged for accomplishments.
We need to focus on enhancing these protective factors for burnout
among medicine residents. Emphasis should be made on factors that
showed significance in protecting residents from burnout and to incorpo-
rate them in training should be sought to decrease burnout among
residents. Programs should also try and measure grit scores early in
residency, as they can potentially identify residents at risk for

### Table 4

| Factors                              | Burnout N (%) | No burnout N (%) | OR (95% CI) |
|--------------------------------------|--------------|-----------------|-------------|
| Having good family relationships     | 26(78.8)     | 35(92.1)        | 0.3 (0.0,1.3) |
| Having good relationships with friends | 20(60.6)     | 34(89.5)        | 0.1 (0.0,0.6) |
| Spiritual belief                     | 22(66.7)     | 27(71.1)        | 0.8 (0.2,2.2) |
| Exercise                             | 7(21.2)      | 19(50.0)        | 0.2 (0.0,0.7) |
| Getting together with other residents| 10(30.3)     | 23(60.5)        | 0.2 (0.1,0.7) |
| Talking together with faculty or physician mentor | 12(36.4)     | 18(47.4)        | 0.6 (0.2,1.6) |
| Prescription Medicines               | 4(12.1)      | 4(10.5)         | 1.1 (0.2,5.1) |
| Talking about my feelings            | 10(30.3)     | 13(34.2)        | 0.8 (0.3,2.2) |
| Professional counseling              | 11(33.3)     | 8(21.1)         | 1.8 (0.6,5.4) |
| Making time for activities I enjoy   | 16(48.5)     | 30(78.9)        | 0.2 (0.0,0.7) |
| Saying no when I need to say no      | 11(33.3)     | 24(63.2)        | 0.2 (0.1,0.7) |
| Feeling like having a say in my residency program | 12(36.4)     | 15(39.5)        | 0.8 (0.3,2.2) |
| Feeling contended and compassionate about my patients | 12(36.4)     | 17(44.7)        | 0.7 (0.2,1.8) |
| Celebrating my accomplishments       | 12(36.4)     | 26(68.4)        | 0.2 (0.0,0.7) |
| Feeling like I have some control over my schedule | 13(39.4)     | 22(57.9)        | 0.4 (0.1,1.2) |
| Good coping skills                   | 14(42.4)     | 21(55.3)        | 0.5 (0.2,1.5) |
| Good time management skills          | 14(42.4)     | 23(60.5)        | 0.4 (0.1,1.3) |
| Being an optimist                    | 15(45.5)     | 17(44.7)        | 1.0 (0.4,2.6) |
| Being happy with childcare arrangements | 8(24.2)      | 8(21.1)         | 1.2 (0.3,3.6) |
| Getting enough sleep                 | 16(48.5)     | 26(68.4)        | 0.4 (0.1,1.1) |
| Having good working relationships?   | 17(51.5)     | 26(68.4)        | 0.4 (0.1,1.2) |
| Having supportive work environment   | 15(45.5)     | 27(71.1)        | 0.3 (0.1,0.9) |
| Having a plan for my future          | 12(36.4)     | 29(76.3)        | 0.1 (0.0,0.4) |
| Having enough money                  | 11(33.3)     | 26(68.4)        | 0.2 (0.0,0.6) |
symptoms of burnout, specifically emotional exhaustion, and implement targeted interventions [33].

4.1. Limitations

The study does have some limitations. Firstly, the results cannot be generalized to public sector universities. Secondly, burnout was measured at one point in time and being post-call while filling the data might have negatively impacted the results. Recall bias also came into place as data collection involved resident’s self-reports instead of defined clinical diagnosis and objective methods. It is also possible that many residents affected by burnout did not participate in the survey and conversely those least affected also avoided participating believing it a futile activity leading to selection bias. Finally, the cross-sectional study design is limited by its inability to consider the variability of symptoms over time.

5. Conclusion

Almost a third of medicine residents were burnt out. While the triggering factors for burnout did not reach a clear level of significance, the protective factors for burnout were mainly linked to having supportive relations, work environment, and career and financial stability. The findings of our study can also be generalized to other tertiary hospitals in low and middle-income countries.

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Provenance and peer review

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Ethical approval

Approval from the ethical review committee of both institutes was obtained before the start of the study (ERC No. 5135_Med ERC-17 from Ethical Review Committee of the Aga Khan University and Ref No.0140318UGMED from Ethical review committee, Ziauddin University).

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Author contribution

Saad Bin Zafar Mahmood planned methodology, completed draft and final writing. Aqsa Zahid conducted survey and did draft writing. Noreen Nasir planned methodology and did draft writing. Munaim Tahir conducted survey. Uzma Ghouri conceptualized the project and did draft writing. Aysha Almas conceptualized the project, reviewed the final writing and supervised. Aysha Almas conceptualized the project, reviewed the final writing and supervised.

Registration of research studies

Name of the registry: ClinicalTrials.gov
Unique Identifying number or registration ID: NCT04864002.
Hyperlink to your specific registration (must be publicly accessible and will be checked):
https://clinicaltrials.gov/ct2/show/NCT04864002.

Guarantor

Ethical Review Committee of the Aga Khan University Hospital.

Corresponding Author: Dr Aysha Almas.

Consent

Voluntary consent was taken for all participants when filling the online survey.

Declaration of competing interest

The authors have no conflict of interests or funding sources to report.

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Appendix A. Supplementary data

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