

# Impact of an Intervention Program to Improve Well-being of Residents in Abu Dhabi, United Arab Emirates

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## Abstract

**Background:** Residency is a stressful period in physicians' life. During this period, residents are subjected to fatigue, depression, anxiety, and burnout. In 2016, we did our first study in Abu Dhabi hospitals to investigate residents' well-being; we found that 86.4% of residents were stressed, 50.8% of them were depressed, and 65.7% of the residents felt emotionally exhausted. Following this study, we introduced interventions to improve residents' well-being in Sheikh Khalifa Medical City (SKMC) residency programs. **Objectives:** To assess the difference between the well-being of residents in the year 2018 compared to 2016 after the implementation of interventions to SKMC residents. **Methods:** Following the initial cross-sectional surveys, interventions were made to improve residents' well-being. Repeated cross-sectional surveys were done to compare between the two periods and quantify the change. **Results:** The percentage of nonsmokers increased in phase 2 from 90% to 94%. The percentage of residents who exercise 1–2 times a week increased from 37.6% to 40.7%. The prevalence of perceived depression was 80% in phase 1 and become 82.4% in phase 2. In phase 1, 89% felt emotionally exhausted compared to 85.5% in phase 2. 28.3% and 22.4% of the residents felt always stressed in phase 1 and 2, respectively. The percentage of residents who are satisfied with their job was 31.7% in phase 1 but improved to 55.3% in phase 2. **Conclusions:** Residents' well-being and satisfaction of their work improved in our research after interventions. The percentage of those who were feeling emotionally exhausted and stressed also improved in phase 2.

**Keywords:** Abu Dhabi, educational intervention, postgraduate training, residents, residents' well-being, United Arab Emirates

## INTRODUCTION

For many postgraduates, residency can be a major source of stress and fatigue which may have a significant impact on residents' ability to care for themselves and their patients.<sup>[1-3]</sup> Physicians spend on an average between 3 and 7 years of their life in residency.<sup>[1-3]</sup> The age between 28 and 33 is the time many individuals would complete their education and proceed to start their own families.<sup>[1-3]</sup> For many residents, residency training forms a barrier to satisfactory transition through this period.<sup>[1-3]</sup> Moreover, residency training is linked to decline in residents' well-being indicators, including sleep, exercise, family interactions, and religious activity and an increase in missing significant events.<sup>[1-3]</sup> Residents, especially in the early years of training, are particularly vulnerable to burnout, with a prevalence rate ranging from 27% to 75%.<sup>[1-3]</sup> The adverse influences of burnout on patient care include medical errors, patient safety risks, and deterioration in the quality of care.<sup>[1-3]</sup>

These observations highlighted the importance of early identification of the stressful precipitators of burnout and encouraged the American Medical Association and Accreditation Council for Graduate Medical Education (ACGME) to stress the importance of monitoring and boosting well-being among clinicians-in-training.<sup>[4]</sup> The hope was to decrease residents' fatigue and comply with the ACGME released requirements that limit resident working hours to no more than an average of 80 h/week.<sup>[2]</sup>

Two studies from the United Arab Emirates (UAE) confirmed high rates of impaired well-being and increased rates of burnout among the residency program.<sup>[5,6]</sup> However, there

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are no reports on any interventions to improve residents' well-being and reduce the burnout of residents. Therefore, the present study aimed to assess residents' well-being after specific well-being enhancement interventions were introduced to evaluate the efficacy of these interventions.

## METHODS

### Study design and setting

A preintervention cross-sectional survey was conducted among resident doctors in Abu Dhabi. Results of that study were published previously.<sup>[5]</sup> In summary, a self-administered questionnaire was distributed to residents in hospitals and primary health-care clinics. In response to the first study, the intervention program described below was introduced. The same questionnaire was distributed to a sample of residents on one of the residents' wellness days. Findings of the two surveys were compared. Data were collected and analyzed anonymously. The research was approved by the Institutional Review Board of Sheikh Khalifa Medical City (SKMC) (reference number RS-406), and all participants provided informed consent to participate in the two study phases.

### Participants

The target population in the second phase included 171 residents, representing eight Abu Dhabi residency programs. Residents were from different specialties such as dermatology, emergency medicine (EM), family medicine (FM), internal medicine (IM), ophthalmology, pediatrics, psychiatry, and radiology in SKMC (including Al Bateen clinic for Family Medicine). Both UAE national and expatriate residents were included in the study. Residents who were on leave or postcall during data collection were not available to participate.

### Materials

A *de novo* self-administered questionnaire was written by the researchers after literature review and expert recommendation. The survey was updated after expert feedback, and pilot study, which was done on twenty resident physicians. After obtaining participants' demographic data, questionnaires were structured into four sections focusing on work-related, health-related, lifestyle-related, and psychosocial-related factors. The questionnaires were kept in sealed envelopes to ensure participants' confidentiality after completion.

### The intervention

Several interventions were introduced in the program. The education department in SKMC together with the House Staff Council which represents residents from each specialty jointly worked on providing well-being promotion interventions for all SKMC residents. Two wellness days were conducted annually focusing on health, mind, and lifestyle which advocate providing coping skills for all residents. Wellness days were conducted during week days and attendance was compulsory. These days were well attended with the exception of residents on call or on leave. The activities included presentations about

relaxation and meditation and practices along with teaching stress-coping mechanisms. Furthermore, a gym was involved in the wellness day with an active exercise session for all residents. Residents were given free access to the gym for a period of time as well as discounted rates for a gym membership to encourage them to be more physically active. Residents also had an opportunity to learn how to generate income outside their career and to improve their financial status. Knowing that stress is related to long duty hours, multiple resting rooms for residents were provided. The program directors monitored the well-being of residents by circulating ACGME surveys to detect and correct any deficiencies. A hotline was provided to residents to consult with an experienced psychologist and psychiatrist any time they need to improve their mental well-being. Although we were aware of the use of hotline, numerical details were not possible as the use was confidential.

The well-being fuel gauge for assessing residents' well-being has been studied.<sup>[7]</sup> The tool was easy to administer, was relatively simple to oversee, and was well accepted by residents. The tool has facilitated assessment and monitoring of residents' well-being by the program directors. The well-being gauge asked residents to report their fuel levels using a 1–5 Likert-type scale (1, empty; 3, half tank; and 5, full tank). Residents who provided low scores (1 or 2) were contacted by program leadership, and the program director sent weekly E-mail updates that addressed residents' comments on their well-being fuel gauge.<sup>[7]</sup>

### Data analysis

Data were tabulated on SPSS software (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp). with the level of statistical significance of  $P < 0.05$ . Data were presented as means, and absolute and relative frequencies (%) were measured. Differences between the results before and after the intervention were tested using Chi-square test for nonpaired testing because the results in the first phase were de-identified for the sake of confidentiality.

## RESULTS

The overall response rate was 80% (120/150) in phase 1 and was 74.1% (86/116) in phase 2; participants' demographic profiles are shown in Table 1. Results were given as actual numbers and relative frequencies as percentages for all the participants who participated in the two phases of the study (i.e., not paired) as the initial results were de-identified before analysis.

### Health and lifestyle well-being

Chronic diseases were higher in phase 1 than in phase 2 [Table 2]. Psychiatric disorders were similar in the two phases. The most prevalent diagnosis was depression. Smoking rates were similar in the two phases of the study [Table 2]. The highest rates of daily smokers were in IM and EM ( $P = 0.031$ ). Smokers were exclusively males. Reports of exercise 1–2 times/week and exercise 3–4 times/week were each

**Table 1: Demographic characteristics of the residents included in the study in phase 1 (n=120) and phase 2 (n=86)**

Characteristics	Phase 1, n (%)	Phase 2, n (%)
Gender		
Male	18 (15)	17 (19.8)
Female	102 (85)	68 (79.1)
Nationality		
UAE	102 (85)	67 (77.9)
Expatriate	18 (15)	18 (20.9)
Marital status		
Single	67 (55.8)	53 (61.6)
Married	52 (43.3)	31 (36)
Divorced/widow	1 (0.8)	1 (1.2)
Number of children		
0	84 (72.4)	67 (78.8)
1-2	26 (22.4)	16 (18.8)
3-5	6 (5.2)	2 (2.4)
Specialty		
Pediatrics	16 (13.3)	23 (27.4)
Internal medicine	33 (27.5)	13 (15.5)
Family medicine	39 (32.5)	27 (32.1)
Ophthalmology	5 (4.2)	4 (4.8)
Emergency medicine	11 (9.2)	4 (4.8)
Radiology	8 (6.7)	3 (3.6)
Psychiatry	6 (5)	9 (10.7)
Dermatology	2 (1.7)	1 (1.2)
Year of residency		
R1	33 (27.7)	37 (44)
R2	26 (21.8)	16 (19)
R3	24 (20.3)	18 (21.4)
R4	25 (21)	7 (8.3)
R5	11 (9.2)	6 (7.1)

Results are given as absolute and relative frequencies, *n* (%) for all the participants who participated in the two phases of the study (i.e., not paired, due to confidentiality).

slightly greater in Phase 2 [Table 2]. Half of the residents would exercise more if a gym were available in the hospital. Reporting of “never eat junk food” was better in the second phase [Table 2]. Furthermore, in both the study groups, three-quarter of the residents stated that they would eat healthier food if available in the hospital. Sleep deprivation was reported by  $\geq 40\%$  of residents, with sleeping  $< 6$  h being reported by 51.3% and 60.5% in phase 1 and 2, respectively.

### Psychosocial well-being

The psychological well being assessments are summarized in Table 3. Prevalence of perceived depression was not different before and after the intervention (80% before vs. 82.4% after). Furthermore, proportions of residents who felt emotionally exhausted were similar [Table 3]. 28.3% and 22.4% of the residents felt always stressed in phase 1 and 2, respectively. In the second phase of the study, 6.5% of married residents had depression in comparison to 3.8% of single residents ( $P = 0.015$ ). In contrast, stress was more prevalent in single residents with a percentage of 7.5% compared to

**Table 2: Health and lifestyle of the residents included in the study before (n=117) and after (n=81) the intervention**

Parameters and responses	Before intervention	After intervention
Exercise		
Never	53 (45.3)	35 (43.2)
1-2 times	44 (37.6)	33 (40.7)
3-4 times	16 (13.7)	12 (14.8)
5 times or more	4 (3.4)	1 (1.2)
Eating junk food per week		
Never	12 (10.3)	3 (3.7)
1-2	68 (58.6)	48 (59.3)
3-5	24 (20.7)	24 (29.6)
$> 5$	12 (10.3)	6 (7.4)
Smoking		
Never	104 (89.7)	76 (93.8)
Ex-smoker	0 (0)	0 (0)
Rarely	4 (3.4)	2 (2.5)
At least once a month	1 (0.9)	0 (0)
At least once a week	3 (2.6)	1 (1.2)
Daily	4 (3.4)	2 (2.5)
Alcohol intake		
Yes/no	2 (1.7)/115 (98.3)	1 (1.2)/80 (98.8)
Use of recreational drugs		
Yes/no	1 (0.9)/119 (99.1)	0 (0)/80 (100)
Number of tea, coffee, or energy drinks you drink per day		
0	13 (11.1)	9 (11.3)
1-2	71 (60.7)	39 (48.8)
3-4	25 (21.4)	21 (26.3)
$> 4$	8 (6.8)	11 (13.8)
Hours of pleasure activities		
$< 8$ h	84 (73)	54 (68.4)
8-15 h	25 (21.7)	20 (25.3)
$> 15$ h	6 (5.2)	5 (6.3)
Hours of sleeping per day		
6 h or less	60 (51.3)	49 (60.5)
7-8 h	54 (46.2)	29 (35.8)
9-10 h	3 (2.6)	3 (3.7)
$> 10$ h	0 (0)	0 (0)
Feeling sleep deprived		
Yes	52 (44.8)	35/80 (43.8)
No	27 (23.3)	18/80 (23.8)
Sometimes	37 (31.9)	26 (32.5)
Chronic disease status		
Having chronic disease		
Yes	16 (13.7)	16 (20.3)
No	101 (86.3)	63 (79.7)
Controlled chronic disease		
Yes	7 (43.8)	6 (37.5)
No	9 (56.3)	10 (62.5)

Data are given as absolute and relative frequencies, *n* (%)

3.2% in married residents ( $P = 0.005$ ). Depression was more common in male residents than female residents (11.8% vs. 2.9%,  $P = 0.02$ ). Furthermore, many more male residents than female residents reported having no coping mechanism (29.4%

vs. 5.9%,  $P = 0.005$ ). Of those who reported “feeling sometimes depressed,” 89.4% had no coping mechanisms. The different coping mechanisms included family support and music [Table 3]. Financial stressors were more common in expatriate residents than UAE nationals (33.3% vs. 7.5%,  $P = 0.004$ ). These stressors were highest in psychiatric residents followed by ophthalmology residents (44.4% and 25%,  $P = 0.031$ ).

### Work-related wellness

Results of the work-related wellness assessments before and after the intervention are given in Table 4. None reported working  $\geq 80$  h/week after the intervention in contrast to 5.1% of residents who worked  $\geq 80$  h/week in phase 1. However, duty hours of 70–80 h/week were reported by 30.4% of pediatric residents ( $P = 0.001$ ). Night calls were considered a stressor by 66.7% of psychiatric residents and 52.2% of pediatric residents ( $P = 0.039$ ). In contrast, ER residents did not find night calls stressful at all. About 77.5% had enough support in phase 1, whereas 86.9% of residents got enough support in phase 2 which is mostly from family support. Program director support was rated highest in ophthalmology, FM, and psychiatry, with percentages of 100%, 84%, and 66.7%, respectively ( $P = 0.002$ ). Compared to the last year, the highest percentages were in ER, ophthalmology, and FM at 70%, 60%, and 56.4%, respectively ( $P = 0.001$ ). All postgraduate year 5 residents reported good program director support than year 1 residents (100% vs. 47.2%,  $P = 0.031$ ). The percentage of residents who were satisfied with their job was remarkably greater in the second phase of the study [Table 4].

## DISCUSSION

Residents' burnout and impaired well-being is a critical issue in medical education institutions.<sup>[1-3]</sup> Several studies have confirmed these concerns from our own region<sup>[5,6,8]</sup> and from North America.<sup>[9]</sup> In a Saudi study, the correlation between stress-coping strategies and perceived stress was examined; residents with the lowest stress level reported to have the highest adaptive stress-coping scores.<sup>[8]</sup> The adaptive stress-coping strategy with the highest score was religion, followed by planning, acceptance, and active coping.<sup>[8]</sup> A Canadian study revealed that only 22% of the participating residents responded appropriately to what would they do in case they have been down and stressed out for a while and it is beginning to affect their work abilities and close relationships (suggestive of depression).<sup>[10]</sup> The authors reported that 25% of the residents would “suffer through it” and 21% would disclose to a colleague. Though the residents recognized the problem stated at the scenario provided in the questionnaire, disclosing to a senior resident only rather than seeking appropriate professional care suggests that the concerned residents thought “suffering through it” is an appropriate reaction.<sup>[10]</sup> Furthermore, a study from the United States correlated residents' unhealthy habits and adverse outcomes.<sup>[11]</sup> Overweight residents were reported to be more likely to eat at a restaurant compared to those with a healthy

**Table 3: Psychosocial aspects of the residents' well-being before and after the intervention**

Parameters	Before intervention	After intervention
Psychiatric disease		
Yes/no	9 (7.5)/111 (92.5)	7 (8.3)/77 (91.7)
Depression	6 (66.6)	4 (57.1)
Anxiety	4 (44.4)	5 (71.4)
Others	2 (22.2)	0
Getting enough support		
Yes/no	93 (77.5)/27 (22.5)	73 (86.9)/11 (13.1)
If getting enough support, how often		
Rarely	4 (4.8)	3 (4.3)
Sometimes	47 (56)	29 (41.4)
Always	33 (39.3)	38 (54.3)
Who provides you with support		
Family	85 (71.4)	69 (84.1)
Program director	43 (36.4)	50 (61)
Faculty	30 (25.4)	35 (42.7)
Friends	68 (57.6)	64 (78)
Feeling stressed		
Never	3 (2.5)	0
Rarely	16 (13.3)	2 (2.4)
Sometimes	67 (55.8)	64 (75.3)
Always	34 (28.3)	19 (22.4)
If yes, what makes you feel stressed		
Working alone without support	30 (25.4)	26 (30.6)
Work load	95 (80.5)	62 (72.9)
Illness	12 (10.2)	18 (21.2)
Financial issues	12 (10.2)	11 (12.9)
Family responsibilities	58 (49.2)	39 (45.9)
Lack of sleep	61 (51.7)	39 (45.9)
Night calls	47 (39.8)	29 (34.1)
Use of stress-coping mechanism		
None	9 (7.5)	9 (10.6)
Family support	80 (66.7)	48 (56.5)
Physical exercise	42 (35)	30 (35.3)
Yoga	10(8.3)	3 (3.5)
Spa	36 (30)	17 (20)
Religious activities	50 (41.7)	29 (34.1)
Music	39 (32.4)	33 (38.8)
Others	14 (11.7)	10 (12.3)
Emotionally exhausted		
Never	13 (11)	12 (14.5)
Rarely	27 (22.9)	22 (26.5)
Sometimes	62 (52.5)	43 (51.8)
Always	16 (13.6)	6 (7.2)
Feeling depressed		
Never	24 (20)	15 (17.6)
Rarely	37 (30.8)	23 (27.1)
Sometimes	56 (46.7)	47 (55.3)
Always	3 (2.5)	0

Data are given as absolute and relative frequencies,  $n$  (%)

weight (67% vs. 51%) and to consume more sweetened beverages (29% vs. 19%).<sup>[11]</sup> While the issues related to



**Table 4: Measures of work-related well-being of the residents before and after the intervention**

Parameter	Before intervention	After intervention
Hours of working per week		
<40	7 (6)	4 (4.8)
40-49	59 (50.4)	34 (40.5)
50-59	24 (20.5)	20 (23.8)
60-69	13 (11.1)	19 (22.6)
70-80	8 (6.8)	7 (8.3)
>80	6 (5.1)	0 (0)
Distance to hospital (min)		
<15	32 (26.7)	25 (29.4)
15-30	44 (36.7)	32 (37.6)
31-45	25 (20.8)	20 (23.5)
>45	19 (15.8)	8 (9.4)
Satisfaction with salary		
Satisfied	48 (40)	34 (40)
Neutral	46 (38.3)	37 (43.5)
Not satisfied	26 (21.7)	14 (16.5)
Satisfaction with job		
Satisfied	38 (31.7)	47 (55.3)
Neutral	64 (53.3)	35 (41.2)
Not satisfied	18 (15)	3 (3.5)

Data are shown as absolute and relative frequencies, *n* (%)

wellness, health, lifestyle, psychological stressors, and coping mechanisms among residents are not new, attempts were made to address them.<sup>[4]</sup> The study population included in the present report seems similar to the first phase done in 2016; in which we found that 11.8% of residents suffer from a chronic disease and 59% exhibited poor control over their illnesses.<sup>[5]</sup> Furthermore, the overall prevalence of perceived stress among all studied residents was 86.4%. Nearly two-thirds (65.7%) of the residents felt emotionally exhausted, while over half (50.8%) felt depressed at some point during training.<sup>[5]</sup>

## CONCLUSIONS

The present study demonstrated that rates of residents' well-being and job satisfaction improve after well-being-enhancing interventions are implemented. Specifically, the percentage of those who were feeling emotionally exhausted and stressed decrease after the intervention. Therefore, support to residents at work and encouraging adoption of healthy lifestyle modifications and stress-coping mechanisms are worthwhile to achieve better well-being and less burnout. Sharing this experience may be particularly relevant for newly developed residency programs worldwide.

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## Authors' contribution

The authors jointly conceived of the study and the design. Data collection and analysis were performed by the residents. Senior physicians provided expertise and guidance. All authors critically revised the manuscript for intellectual content and approved its final version.

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The study did not receive any specific funding or sponsorship from any agency.

## Conflicts of interest

There are no conflicts of interest.

## Compliance with ethical principles

The study was approved by the Institutional Review Board of SKMC, and all participants provided informed consent. All data were stored and analyzed anonymously.

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