

Prevalence of Burnout Syndrome and Associated Factors among Undergraduates of Medical and Allied Health Sciences; Experience from a Sri Lankan University

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Abstract. Burnout syndrome is a set of symptoms leading to emotional exhaustion, depersonalization and reduced performance. This may develop in many healthcare providers and is therefore an important concern in healthcare. This study aimed to assess the prevalence of Burnout Syndrome and its associated factors among Medical and Allied Health Sciences (AHS) undergraduates of the University of Ruhuna, Sri Lanka. A cross-sectional study was conducted among 157 medical and AHS undergraduates at the University of Ruhuna. Burnout was measured using the judgmentally validated Oldenburg Burnout Inventory (Student version). Data were collected using a self-administered questionnaire through a Google form. The chi-square test was used to assess factors associated with burnout syndrome at a 0.05 significance level. A total of 157 undergraduates, 71.3% medical and 28.6% AHS undergraduates participated in this study. The prevalence of burnout syndrome was 47.8% in the total sample while it was 58.1 % among medical and 22.2% among AHS undergraduates. Being a medical undergraduate ($p<0.001$), having financial difficulties ($p<0.05$) and undergraduates who were selected for the course according to advanced level merit ($p<0.001$) were more likely to have Burnout syndrome. Among undergraduates with burnout syndrome, the majority (>70%) had adopted, active coping strategies for burnout. In conclusion, burnout syndrome is reported in high prevalence among the participants and more in medical undergraduates within the sample. As a financial status, course and selection criteria for the course were associated with burnout, those factors need to be considered to avoid chronic stressors among them.

Keywords. Burnout syndrome, Associated factors, Medical and AHS undergraduates

INTRODUCTION

“Burnout” is described as a syndrome of emotional exhaustion, depersonalization and reduced accomplishment (1). This may develop in many providers and is therefore an important concern in healthcare. It is more likely to occur when there is significant stress without adequate support and resources in the face of work overload, as commonly happens with physicians and undergraduate medical undergraduates (2). It is characterized by three primary symptoms: exhaustion, alienation and reduced performance. Exhaustion refers to being emotionally drained and exhausted. Alienation from activities refers to when the affected person becomes cynical and detached from his work. Reduced performance refers to the affected person who was previously performing in his field, begins to underperform and even neglects his responsibilities.

The above-mentioned symptoms are said to be diagnostic of Burnout, but they can be seen in depression as well the difference is that burnout is mainly work-related exhaustion, while someone dealing with depression tends to have generalized negative feelings and thoughts. Depression also tends to have the following symptoms low self-esteem, hopelessness and suicidal tendencies (3). Low self-esteem, hopelessness and suicidal tendencies are not typically accompanied by burnout. Therefore, people with burnout do not always have depression, but burnout could increase the risk of someone developing depression (3).

These people adopted to overcome this syndrome through various efforts, both behavioural and psychological, that people employ to master, tolerate, reduce or minimize stressful events. People tend to follow one of the two mentioned strategies: Problem-focused or Emotion-focused efforts.

Problem-based efforts taken by the person try to identify the root cause of all their problems and try to find a solution to that, whereas emotion-based efforts involve the person reducing, regulating or removing the source of stress therefore giving rise to harmful habits such as alcohol, sub-stance abuse and illegal drugs. This form of effort in turn does not just ruin the person's occupational life but also tends to harm the person's personal life (2).

There have been many researches carried out around the world on the prevalence of Burnout syndrome among undergraduates. According to research carried out in Brazil in 2016, it showed that there was a 14.9% prevalence of undergraduates affected with Burnout syndrome (4). Research carried out in Pakistan showed that there was an 18.2% prevalence of undergraduates affected with Burnout syndrome (5). Further research carried out in Saudi Arabia in 2019 showed that there was a 13.4% prevalence of undergraduates affected with Burnout (6). A study carried out in three medical colleges across India (2) found high perceived stress levels, lack of support, control, and dissatisfaction among undergraduates in the third and fifth semesters. According to a systemic review and narrative synthesis of articles on the presence of Burnout Syndrome among medical students of Chinese origin studying in China, 39 studies reported high levels of burnout amongst medical undergraduates in China, with over 40% of undergraduates in most studies identified as having more than moderate levels of burnout (7).

Although burnout has not been assessed among medical undergraduates in Sri Lanka, evidence from other nations suggests that prevalence could be high. However, research carried out in five Universities (Colombo, Sri Jayewardenepura, Peradeniya, Moratuwa, and Open University in Colombo) in Sri Lanka showed that the majority of the undergraduates had psychological distress (8). Given how stress is a vital contributor to a person developing Burnout, the present cross-sectional study was carried out on the prevalence, severity and factors associated with Burnout syndrome among the Medical and AHS undergraduates of University of Ruhuna.

Authors feel the knowledge would prove to be informational on the presence of

Burnout syndrome and could help us gain insight and hopefully lead to a solution to the issue, which could be beneficial not only for an affected student but also the patients that the student might attend to after he has passed out from the faculty. Medical and AHS undergraduates (Pharmacy, Medical Laboratory Sciences and Nursing) are exposed to psychosocial stressors during training due to heavy curriculum. Therefore, medical and AHS undergraduates are more vulnerable to Burnout syndrome. After undergraduates start clinical appointments, they have a high possibility of developing Burnout syndrome. Intake of students for the respective academic year for the study had exposed to clinical recently, therefore it is a new experience for their career. However, medical and AHS curriculums have differed from each other, medical and AHS undergraduates are involved in clinical training in different aspects. So, we assume both medical and AHS undergraduates are vulnerable to Burnout syndrome at different levels. Hence, both study populations were included in the study. With this background and justification, this study was conducted to assess the prevalence of Burnout Syndrome and its associated factors among undergraduates of Medical and AHS of University of Ruhuna, Sri Lanka.

METHODS

Study Design and Study Sample It was an institutional-based cross-sectional study. The study was conducted among undergraduates of Medical and AHS of the academic year 2015/2016 University of Ruhuna just after they started their clinical appointments. A Total of 223 undergraduates of Medical and AHS of the academic year 2015/2016 of the University of Ruhuna were included in the study. Undergraduates with chronic medical and mental illnesses and batch-missed undergraduates were excluded from the study. The sample size was calculated using the formula given by Lwanga and Lemeshow for the sample size calculation based on prevalence (9). According to the calculation, a minimum of 142 study subjects were required for the study, but all 223 undergraduates were recruited for the study on convenience.

Study instrument and Data collection. A self-administered questionnaire was used for

data collection as a Google form®. The questionnaire was provided in English language. The questionnaire included personal data, Student factors, Burnout Assessment, and Coping strategies. Oldenburg Burnout Inventory- The student version was used to evaluate burnout as it was identified as a suitable tool to assess Burnout Syndrome (10). The relevant Google forms® were sent to the study subjects via the official WhatsApp group. The undergraduates were given a clear explanation with the help of the batch representatives of each course, on the purpose of the research and that the data will be maintained confidentially. As some questions were sensitive for undergraduates (ragging, alcohol) self-administrative questionnaire was helpful for them to answer the questions. The questionnaire was judgmentally validated by a panel of experts including one consultant community physician, one consultant psychiatrist and one expert in the field of medical education and it was pre-tested on a sample of 25 Engineering undergraduates in Engineering Faculty, University of Ruhuna and relevant changes were made before commencing the final data collection. Permission was taken from the Deans of Faculty of Medicine and AHS of the University of Ruhuna prior to the study.

Data Analysis. The collected data was entered into a database created using Microsoft Excel and analysis was performed using Statistical Package for Social Sciences (SPSS) Version 20. Frequency, proportion, mean, and median were calculated as appropriate. Tables were used to summarize and present data. The presence of Burnout Syndrome was assessed using the Oldenburg Burnout Inventory for college students (OLBI-S). It included positively and negatively framed items to assess two core dimensions of burnout, exhaustion and disengagement. It consisted of sixteen questions; eight questions to assess exhaustion and eight for disengagement (11). These sixteen ordinal items anchor of 1: Strongly disagree and 4: Strongly agree, both the sections are scored separately, and the mean value of exhaustion and disengagement was considered against a cutoff value of 2.25 and 2.10 for emotional

exhaustion and disengagement respectively. Scoring above the cutoffs for emotional exhaustion and disengagement was considered a person having burnout syndrome (11). The chi-square test was used to test the association between variables. The level of significance was considered as 0.05. Data analysis was not performed as a subgroup analysis (medical vs AHS) and was done based on the presence or absence of burnout out of the total sample size.

RESULTS

Out of the study population of 223, only 157 participated with a response rate of 70.4%. The majority of the study participants were medical undergraduates (n=112, 71.3%) while the rest of the undergraduates were from AHS (n=45, 28.7%). The sample was made up of 34.4% male and 65.6% female undergraduates.

Prevalence of Burnout syndrome among undergraduates of Medical and AHS Out of the 157 student participants in the study, a total of 75 (47.80%) participants recorded scores on the Oldenburg Burnout Inventory that were consistent with burnout. Therefore, the prevalence of Burnout among the total sample was 47.8%. The prevalence of Burnout among medical undergraduates was 58.00% while among AHS undergraduates it was 22.20%.

Factors associated with Burnout syndrome. Gender, ethnicity, faculty, financial difficulties and residence were assessed under socio-demographic factors (Table 1). Among them, the faculty of the undergraduate student and the financial status of the student had statistically significant associations with the presence of burnout syndrome. Being a medical undergraduate ($p<0.001$) and undergraduates having financial difficulties ($p=0.009$) were more likely to have Burnout syndrome compared to AHS undergraduates and undergraduates not having financial difficulties. Gender, ethnicity and residence of the undergraduate did not have a statistically significant association with the presence of burnout syndrome at a 0.05 significance level.

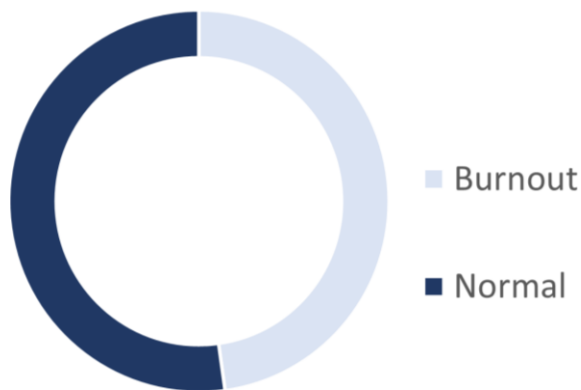


Figure 1. Prevalence of Burnout among undergraduates of Medical and AHS (n=157)

Last examination results, study pattern and language difficulties were assessed under academic factors (Table 2). Among academic factors, the reason for following the course had a statistically significant association with the presence of burnout syndrome. Undergraduates who were selected purely according to university entry examination merit were more likely to have burnout compared to others ($p < 0.001$). Last examination results, study patterns and language difficulties did not have a statistically significant association with the presence of burnout syndrome at a 0.05 significance level.

Table 1. Sociodemographic factors associated with Burnout syndrome among undergraduates of Medical and AHS(N=157)

Sociodemographic factors	Presence of burnout syndrome		Total	Significance
	Yes N (%)	No N (%)		
Gender				
Male	21 (38.88)	33 (61.12)	54(100)	$\chi^2 = 2.60$ $p=0.10$
Female	54 (52.43)	49 (47.57)	103(100)	
Ethnicity				
Sinhala	75 (48.39)	80 (51.61)	155(100)	$\chi^2 = 1.85$ $p=0.17$
Muslim	00	02 (100)	02(100)	
Faculty				
Medicine	65 (58.04)	47 (41.96)	112(100)	$\chi^2 = 16.50$ $p < 0.001^*$
AHS	10 (22.22)	35 (77.78)	45(100)	
Financial difficulties				
Yes	52 (56.52)	40 (43.48)	92(100)	$\chi^2 = 6.82$ $p=0.009^*$
No	23 (35.38)	42 (64.62)	65(100)	
Residence				
Home	14 (36.00)	11 (44.00)	25(100)	$\chi^2 = 0.80$ $p = 0.36$
Outside home	61 (46.21)	71 (53.79)	132(100)	

* Significant at the 0.05 level

Feeling homesick, altered sleep patterns and interactions with seniors, batch mates, juniors, lecturers and also having a mentor and frequency of visiting a mentor were assessed under psycho-social factors (Table 3). However, none of them had a statistically significant association with the presence of burnout syndrome at a 0.05 significance level.

Coping strategies adopted by the undergraduates. Under coping strategies,

we assessed the frequency of active and avoidant coping strategies adopted by the undergraduates (Table 4). Among coping strategies adopted out of 75 participants of the sample with burnout, there were high frequency of the adopting to active coping strategies like looking for something good in the situation and trying to make it more positive and coming up with a suitable answer to solve the problem.

Table 2. Academic factors associated with Burnout syndrome among undergraduates of Medical and AHS(n=157)

Academic factors	Presence of burnout syndrome		Total	Significance
	Yes N(%)	No N(%)		
Last examination results				
Proper Pass	64 (50.79)	62 (49.01)	126(100)	$\chi^2= 2.33$ p=0.12
Repeat	11 (35.48)	20 (64.52)	31(100)	
Study pattern				
Alone	27 (44.26)	34 (55.74)	61(100)	$\chi^2 = 0.49$ p=0.48
As a group	48 (50)	48 (50)	96(100)	
Language difficulty				
Yes	41 (46.59)	47 (53.41)	88(100)	$\chi^2 = 0.11$ p=0.73
No	34 (49.27)	35 (50.73)	69(100)	
Reasons for following your course				
Based on entry exam results	54 (67.50)	26 (32.50)	80(100)	$\chi^2 = 25.44$ p<0.001*
Other**	21 (27.27)	56 (72.73)	77(100)	

*Statistically significant at 0.001 level

** Parents forced to do the course, undergraduates self-selected the course, students didn't have any other option

Of the avoidant coping strategies, the positive avoidant coping strategies like trying to reduce stress by listening to music had a

high frequency. Among the negative avoidant coping strategies smoking and using illicit drugs when stressed had least frequencies.

Table 3. Psychosocial factors associated with Burnout syndrome among undergraduates of Medical and AHS (N=157)

Psychosocial factors	Presence of burnout syndrome		Total	Significance
	Yes N (%)	No N (%)		
Feeling homesick				
Yes	58 (52.25)	53 (47.75)	111(100)	$\chi^2 = 3.05$ P = 0.08
No	17 (36.95)	29 (63.05)	46(100)	
Altered sleep pattern				
Yes	59 (52.67)	53 (47.33)	112(100)	$\chi^2 = 3.77$ p= 0.05
No	16 (35.55)	29 (64.45)	45(100)	
Interaction with batch mates				
Satisfactory	75 (48.39)	80 (51.61)	155(100)	$\chi^2 = 1.85$ p=0.17
Unsatisfactory	00	02 (100)	02(100)	
Interaction with Juniors				
Satisfactory	61 (49.59)	62 (50.41)	123(100)	$\chi^2= 0.75$ p=0.38
Unsatisfactory	14 (41.18)	20 (58.82)	34(100)	
Interaction with lecturers				
Satisfactory	53 (45.69)	63 (54.31)	116(100)	$\chi^2= 0.77$ p=0.36
Unsatisfactory	22 (53.66)	19 (46.34)	41(100)	
Having a mentor at the university				
Yes	73 (48.34)	78(51.66)	151(100)	$\chi^2 = 0.521$ p=0.47
No	02 (33.33)	04 (66.67)	06(100)	
Visiting the mentor				
Yes	37 (57.81)	27 (42.19)	64(100)	$\chi^2 = 5.19$ p=0.07
No	36(40.00)	54 (60.00)	90(100)	

Table 4: Coping strategies adopted by undergraduates associated with Burnout syndrome among undergraduates of Medical and AHS (n=75)

Coping strategies	n	%
Look for something good in the situation and try to make it seem more positive	62	82.66
Think about what steps to take and try to come up with a suitable plan to solve the problems	67	89.33
Try to get advice from relevant people and worked accordingly	65	86.66
Put aside other activities to concentrate on the problem	54	72.00
Force their selves to be patient and not act too soon	62	82.66
Try to reduce stress with physical activity	28	37.33
Try to find comfort in their religion and spiritual beliefs	55	73.33
Try to reduce stress by listening to music	68	90.66
Try to get emotional support and comfort from friends or colleagues	60	80.00
keep all their feelings to myself and try to deal with the problem by themselves	43	57.33
Smoke when they are stressed	05	6.66
Consume alcohol when they are stressed	07	9.33
Use drugs (cannabis, heroin, cocaine) when they are stressed	01	1.33

DISCUSSION

This study was conducted among 223 undergraduates and we got 157 responses, which included 71.3% Medical and 28.7% AHS undergraduates of the Faculty of Medicine and AHS of the University of Ruhuna to determine the Prevalence of burnout Syndrome and associated factors (demographic, psychosocial and academic) of them. According to the Oldenburg Burnout Inventory (OLBI-S), 47.8% of participants had burnout syndrome, which is less than the study carried out among medical undergraduates in India which was recorded to be 53% (2) and also higher compared to a study carried out in Brazil which recorded only 14.9% of undergraduates having burnout (4). However, the sample size is small and the numbers obtained from the two faculties are different. There are differences in clinical training in different degree programs in AHS; nursing has more while the other two (pharmacy and medical laboratory sciences)

have less. Therefore, the study identified them as limitations.

A significant proportion of medical undergraduates with burnout has wide-ranging implications. For one, burnout is known to be associated with dropping out of the course, enrollment in a higher number of disciplines, lack of leisure time, dissatisfaction with the course, advanced semesters, attending complementary courses, and lack of professional experience (12) Moreover, it has also been recorded that

medical professionals with burnout tend to perform more clinical errors (13).

Therefore, burnout needs to be urgently addressed at the student level. The associations between demographic, psychosocial and academic factors with the prevalence of burnout were assessed. In the present study, there was a significant association between socio-demographic factors such as studying in medical faculty (58.0%), low financial income (56.2%) and students wishing to study the course (67.5%) with the presence of burnout syndrome.

There was no significant association between gender and the presence of burnout. There are higher numbers of female medical undergraduates with burnout due to the high population of female undergraduates. By contrast, according to research carried out in China, it was noted that gender had a significant association with burnout where more male medical undergraduates had burnout (7). It was also noted that male undergraduates were associated with a higher percentage of burnout (12).

In the present study, the presence of burnout is not associated with having interpersonal relationships with juniors, seniors and lecturers. A study conducted in Chinese medical undergraduates showed that interpersonal relationships and a positive learning atmosphere were negatively associated with some dimensions of burnout (exhaustion and depersonalization). Notably, interpersonal relationships within the dormitories were associated with lower burnout (7).

Academic factors such as the results of the last Examination for Medical Degrees had no significant association with burnout. In a study of medical undergraduates done in Brazil, it was revealed that key symptoms of burnout, were associated with the following factors; intention of dropping out of the course, enrollment in a higher number of disciplines, lack of leisure time, dissatisfaction with the course, advanced semesters, attending complementary courses, and lack of professional experience. On the other hand, high levels of professional efficacy were associated with intention to stay in the course, good academic performance, expectations of success, adequate leisure time, professional experience and satisfaction with the course (12).

Coping strategies can be classified into active (problem-based) and avoidant (emotional-based) coping strategies (14). Active coping strategies are behavioural or psychological responses designed to change the nature of the stressor itself or how one thinks about it, while avoidant coping strategies lead people into activities such as alcohol use or into a mental state such as withdrawal, preventing them from addressing the issue at hand (14). Medical undergraduates used both active and avoidant coping strategies. Of the active coping strategies, most of the

undergraduates with burnout had adopted being more positive (82.6%) and planning to come up with a proper solution for the problem (89.3%). Of the avoidant coping strategies, positive avoidant strategies such as listening to music (90.6%), finding comfort in religious activities (73.3%) and getting emotional support (80.0%) were more commonly used by the undergraduates, whereas, exercise and meditation (37.3%) was not a common practice among undergraduates affected with burnout. Of the negative avoidant coping strategies, it was seen that most of the burnout-affected undergraduates adapted by keeping their feelings to themselves and trying to deal with the problem on their own (57.3%) while the minority of the undergraduates indulged in smoking (6.6%) and alcohol consumption (9.3%) as a method of coping. Overall, the majority of undergraduates reported using either active or positive coping strategies, but the number of undergraduates using avoidant coping strategies cannot be neglected as avoidant coping is considered a psychological risk factor for adverse responses to stressful life events (15).

A study carried out by a medical faculty in Malaysia found that medical undergraduates used active coping strategies such as positive reframing, and acceptance more than avoidant strategies such as denial, self-blame, and alcohol or substance abuse (16). Another study among doctors in Colombo South Teaching Hospital revealed that the majority of medical officers did not practice alcohol and substance abuse as a way of stress management (92%). However, it was seen that a large number of medical officers (57%) engaged in harmful avoidant/emotional coping where they tried to keep all their feelings to themselves without expressing and blaming themselves (17). There are a variety of positive coping strategies that may help to reduce the incidence of burnout. These include those that focus on personal engagement, extracurricular activities, positive reinterpretation and expression of emotion, student-led mentorship programs, evaluation systems, career counselling and life coaching (18). In the present study, we found that a large majority of undergraduates did not interact with their mentors. This could contribute towards developing burnout and should be something that should be strictly

implemented among undergraduates such that a steady foundation may be laid on which the undergraduates can develop.

CONCLUSIONS

Results of the study indicate that nearly half of the participants had burnout syndrome. Studying in medical faculty and low financial income had a significant association with burnout whereas factors such as gender, leisure activities, homesickness and sleep did not have any significant association with burnout within the sample. Amongst the coping strategies, both active and avoidant coping strategies were used, of which active coping strategies were seen to have been more commonly adopted by undergraduates affected with burnout. Communication between undergraduates and lecturers was low compared to their interaction with their colleagues.

Therefore, mentoring programs should be reinstated and undergraduates should be encouraged to go and talk to their mentors so that they build good rapport with the mentors. Burnout syndrome is more prevalent among the medical undergraduates than AHS undergraduates of this study while such a condition could lead to reduced performance by the medical undergraduates in their academics and social life. Moreover, the undergraduates adopting negative avoidant coping strategies need more attention as this could worsen their psychological state. The administration should try and implement a strict mentorship program involving both

lecturers and undergraduates such that undergraduates can have a very good foundation which they can develop throughout the remainder of their course. More research on burnout should be carried out to understand whether the high prevalence in Ruhuna is consistent with the situation in other Faculties of Medicine and AHS faculties within Sri Lanka. Through the present study, authors identify that students with financial difficulties were more prone to burnout than others. Therefore, it is recommended to provide financial support via scholarships for needy undergraduates.

Ethical clearance. The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the ethical review committee of the Faculty of Medicine University of Ruhuna [Reference number: 2020P026 (21.01.2020)] Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

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REFERENCES

1. Maslach C, Jackson SE, Leiter MP. Maslach burnout inventory. Scarecrow Education; 1997.
2. Bera T, Mandal A, Bhattacharya S, Biswas NM, Ghosh A, Bera S. Burnout among medical students—a study across three medical colleges in Eastern India. *Ind Med Gaz.* 2013; 2013:356-9.
3. <https://www.helpguide.org/articles/suicide-prevention/suicide-prevention.htm>, Suicidal prevention, retrieved on 20.06.2023
4. Almeida GD, Souza HR, Almeida PC, Almeida BD, Almeida GH. The prevalence of burnout syndrome in medical students. *Archives of Clinical Psychiatry (São Paulo).* 2016 Jan; 43:6-10.
5. Asghar AA, Faiq A, Shafique S, Siddiqui F, Asghar N, Malik S, Kamal SD, Hanif A, Qasmani MF, Ali SU, Munim S. Prevalence and predictors of the burnout syndrome in medical students of Karachi, Pakistan. *Cureus.* 2019 Jun 11;11(6).
6. Altannir Y, Alnajjar W, Ahmad SO, Altannir M, Yousuf F, Obeidat A, Al-Tannir M. Assessment of burnout in medical undergraduate students in Riyadh, Saudi Arabia. *BMC medical education.* 2019 Dec;19(1):1-8.
7. Chunming WM, Harrison R, MacIntyre R, Travaglia J, Balasooriya C. Burnout in medical students: a systematic review of experiences in Chinese medical schools. *BMC medical education.* 2017 Dec;17(1):1-1.
8. Kuruppuarachchi KA, Wijerathne S, Williams SS. Psychological distress among students from five universities in Sri Lanka, *Ceylon medical journal,* 2002, 47(1),13-15
9. Lwanga SK, Lemeshow S, World Health Organization. Sample size determination in health studies: a practical manual. World Health Organization; 1991.

10. Campos JA, Carlotto MS, Marôco J. Oldenburg Burnout Inventory-student version: cultural adaptation and validation into Portuguese. *Psicologia: Reflexão e Crítica*. 2012; 25:709-18.
11. Peterson U, Demerouti E, Bergström G, Samuelsson M, Åsberg M, Nygren Å. Burnout and physical and mental health among Swedish healthcare workers. *Journal of advanced nursing*. 2008 Apr;62(1):84-95.
12. de Oliva Costa EF, Santos SA, de Abreu Santos AT, de Melo EV, de Andrade TM. Burnout Syndrome and associated factors among medical students: a cross-sectional study. *Clinics*. 2012 Jun 1;67(6):573-9.
13. Shanafelt TD, Balch CM, Bechamps G, Russell T, Dyrbye L, Satele D, Collicott P, Novotny PJ, Sloan J, Freischlag J. Burnout and medical errors among American surgeons. *Annals of surgery*. 2010 Jun 1;251(6):995-1000.
14. Krohne HW. Attention and avoidance: Strategies in coping with aversiveness. Hogrefe & Huber Publishers; 1993.
15. Holahan CJ, Moos RH. Risk, resistance, and psychological distress: a longitudinal analysis with adults and children. *Journal of abnormal psychology*. 1987 Feb;96(1):3.
16. Al-Dubai SA, Al-Naggar RA, Alshagga MA, Rampal KG. Stress and coping strategies of students in a medical faculty in Malaysia. *The Malaysian journal of medical sciences: MJMS*. 2011 Jul;18(3):57.
17. Kathriarachchi M, Rowntree G. A Pilot Study on Burnout Syndrome: Its existence, causes and coping strategies practised by medical professionals in Colombo South Teaching Hospital, Sri Lanka.
18. Fares J, Al Tabosh H, Saadeddin Z, El Mouhayyar C, Aridi H. Stress, burnout and coping strategies in preclinical medical students. *North American journal of medical sciences*. 2016 Feb;8(2):75.