Case-controlled Study

The prevalence of burnout syndrome and its association with adherence to safety and practice standards among anesthetists working in Ethiopia

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ABSTRACT

Background: Burnout amongst healthcare professionals is a serious challenge affecting health care practice and quality of care. The ongoing pandemic has highlighted this on a global level. This study aimed to determine the prevalence of burnout syndrome and its association with adherence to safety and practice standards among non-physician anesthetists in Ethiopia.

Methods: A cross-sectional survey was conducted amongst non-physician anesthetists throughout Ethiopia in January 2020 utilizing an online validated questionnaire containing sociodemographic characteristics, symptoms of burnout using the 22 items of the Maslach Burnout Inventory-Human Services Survey (MBI-HSS) scale, 10 questions designed to evaluate the best practice of providers, and 7 questions evaluating self-reported errors. The MBI-HSS questions assessed depersonalization, emotional exhaustion, and personal accomplishment. A high level of burnout was defined as a respondent with an emotional exhaustion score ≥ 27, a depersonalization score ≥ 10, and a personal accomplishment score ≤ 33 in the MBI-HSS subscales. Bi-variable and multivariable logistic regression were used to identify factors associated with burnout.

Results: Out of a total of 650 anesthetists approached, 400 responded, a response rate of 61.5%. High levels of burnout were identified in 17.3% of Ethiopian anesthesia providers. Significant burnout scores were found in academic anesthetists (p = 0.01), and were associated with less years of anesthesia experience (p < 0.001), consuming > 5 alcoholic drinks per week (p = 0.02), and parenthood (p = 0.01).

Conclusion: We found that non physician anesthetists working in Ethiopia is suffering by high levels of burnout. The problem is alarming in those working at academic environments and less experienced.

1. Background

Burnout is a syndrome characterized by emotional exhaustion, depersonalization, and loss of sense of achievement that results from prolonged exposure to job stressors [1–4]. Burnout in healthcare professionals is a global challenge affecting health care practice and quality of care which has reached epidemic levels [5–7]. Although often overlooked, burnout remains a real problem in the medical profession and can lead to reduced job satisfaction, productivity, and patient care [8].

Anesthesia is a medical profession with a high prevalence of stress due to the nature of the daily work environment [4,6,9]. Due to its position on the front line of patient care, burnout is very frequent among anesthetists [10,11]. Besides its effect on the professionals’ health, burnout has been linked with tense professional relationships in team members, together with lower work activity, worse quality of care, and higher health care costs [10,12–14].

Anesthetists at a high risk of burnout have reported more frequent medication errors, mistakes with negative consequences for patients, less attention to patients, a trend to leave the practice, drug addiction, and suicidal ideation [11]. In Ethiopia, anesthetists report low job satisfaction (42.5%) and a high turnover intention (47.8%) rate, signalling that anesthetists are dissatisfied with their jobs and suffer from low morale and motivation [15,16].

Physicians are highly affected by burnout; a systematic review reports the prevalence of burnout is highly varied across studies (10%–41% high risk, up to 59% at least moderate risk) [6]. A high level of
burnout has been consistently associated with the strained working pattern, working as a younger consultant, and having children, but no consistent relationship has been found between burnout and hospital characteristics, gender, or marital status [6]. Burnout is a real phenomenon in anesthesia and approximately 25% of anesthetists are at high risk of developing it [9]. A high burnout score has been noted in young anesthetists, and associated with fewer years of anesthetic experience, and female gender [8]. This study aimed to determine the prevalence of burnout syndrome and its association with adherence to safety and practice standards among non-physician anesthetists in Ethiopia.

2. Materials and methods

A cross-sectional nationwide survey was distributed to 650 qualified anesthetists working across Ethiopia in January 2020. Anesthetists’ contact details were obtained through the Ethiopian Association of Anesthetists social media networking group ‘Telegram’ channel. An invitation to participate and a link to the online survey, created using Survey Monkey software, was then sent via email. Survey completion was voluntary and confidential. To assure the confidentiality of the participants, the survey was set up to delink the responses to the respondents’ IP address or account. The software created a unique identifier to prevent multiple responses from a single participant. The questionnaire was divided into 4 parts and contained 46 questions. A combination of multiple-choice questions and Likert scales quantifying respondents’ level of agreement with a statement, were used.

The first section of the questionnaire was designed to capture demographic, social, and work characteristics. The second section of the questionnaire was the Maslach Burnout Inventory-Human Services Survey (MBI-HSS) [17]. The MBI-HSS includes 22 questions: 5 assessing depersonalization, 9 for emotional exhaustion, and 8 for personal accomplishment. A score is given to each part of the MBI-HSS, based on a frequency scale of 0 (‘never’) to 6 (‘every day’). A high level of burnout was defined as a respondent with an emotional exhaustion score ≥27, depersonalization score ≥10, and personal accomplishment score ≤33 in these MBI-HSS subscales [8,18–20].

The third section of the questionnaire included 10 questions designed to evaluate behaviors commonly identified as best practices in anesthesia, adapted from the work of previous investigators [19]. Questions were evaluated using a 5-point Likert scale (never, rarely, sometimes, often, and always). The fourth section of the questionnaire included 7 questions that evaluated the frequency of self-reported errors using questions developed by previous investigators. The frequency was evaluated using a 5-point Likert scale (never, once, sometimes, multiple times, often). The surveys were administered in English language. The questionnaire was tested for reliability and internal validity. The inter-correlation coefficient (alpha) was 0.89, indicating a good construct of the questionnaire.

SPSS version 20 software was used for statistical analysis. In addition to simple descriptive statistics, both bivariable and multivariable logistic regression were used to identify factors associated with the burnout level of anesthetists. In the multivariable analysis, variables with a p-value <0.05 were considered statistically significant. Our work is fully compliant with the STROCSS criteria [1]. It was register with unique identifying number researchregistry7086.

Ethical approval was obtained from the academic committee of the department of anesthesia, Debre Tabor University. Written informed consent was obtained from each study participant.

3. Results

Out of a total of 650 anesthetists approached, 400 responded (response rate of 61.5%); of these 95% (n = 380) of participants were male and 71.5% (n = 286) were within the 20–30-year age group. Most (67.8%; n = 271) were single. The majority of the anesthetists had less than 5 years’ experience in clinical practice (64%; n = 256), reported working greater than 40 h per week (67.5%; n = 270), and were in academic roles (59.3%; n = 237). The prevalence of burnout amongst responding anesthetists in Ethiopia was 17.3% (n = 69) (Table 1).

In this survey, 8.8% (n = 35) of anesthetists reported performing procedures without appropriate training and 31.3% (n = 53) reported that they fall short in the quality of care they provide ‘multiple times. In addition, 4.3% (n = 17) agreed they do not monitor the patient in the operating room as closely as they should ‘multiple times or ‘often, 4.8% (n = 19) make mistakes without negative consequences to their patients ‘multiple times and 43.1% (n = 172) had made a medication error at least once in the last year (Table 2).

Fewer years of work experience, parenthood, alcohol, and academic roles were found to be significantly associated with a high level of burnout in the multivariate analysis (Table 3). Anesthetists with less than 5 years of work experience were more likely to experience a high level of burnout compared to those with more than or equal to 5 years of experience (AOR: 27.87, 95%CI: 6.21–125.04). Anesthetists in an academic role were 4.38 times more likely to experience a high level of burnout compared to their non-academic counterparts.

Anesthetists who reported consuming on average greater than or equal to 5 alcoholic drinks per week were more likely to experience a high level of burnout compared to those consuming on average less than 5 alcoholic drinks per week (AOR: 5.23, 95%CI: 1.29–21.19). In addition, anesthetists who were parents were 3.28 times more likely to experience a high level of burnout. Educational level (higher or lower) was not significantly associated with a high level of burnout (P = 0.057).

| Table 1 | Socio-demographic characteristics and prevalence of burnout syndrome amongst study participants. |
| Variable | Number (%) |
| Age | |
| 20–30 years | 286(71.5) |
| 31–40 years | 114(28.5) |
| Sex | |
| Male | 380(95) |
| Female | 20(5) |
| Marital status | |
| Married | 129(32.3) |
| Single | 271(67.8) |
| Role in Academia | |
| Yes | 237(59.3) |
| No | 163(40.8) |
| Level of Education | |
| Bachelor of Science (BSc) | 235(58.8) |
| Master of Science (MSc) | 165(41.3) |
| Average working hours per week | |
| 10–20 h | 23(5.8) |
| 21–40 h | 107(26.8) |
| >40 h | 270(67.5) |
| Consume >5 alcohol drinks per week | |
| Yes | 200(50) |
| No | 200(50) |
| Obtain recognition from managers | |
| Yes | 95(23.8) |
| No | 305(76.3) |
| Cigarette smoking | |
| Yes | 15(1.8) |
| No | 185(96.3) |
| Work Experience | |
| Less than 1 year | 57(14.2) |
| 1–5 years | 199(49.8) |
| 6–10 years | 117(29.3) |
| Greater than 10 years | 27(6.8) |
| Parenthood status | |
| Yes | 176(44) |
| No | 224(56) |
| Burnout | |
| Yes | 69(17.1) |
| No | 331(82.8) |
Table 2
Response distribution to individual questions evaluating anesthetists self-reported errors and quality of care.

| Individual items | Likert scale, Number (%) |
|------------------|--------------------------|
|                  | Never | Once | Sometimes | Multiple times | Often |
| I make mistakes without negative consequences to patients | 63 (15.8) | 92 (23) | 222 (55.5) | 19(4.8) | 4(1) |
| I perform procedures without appropriate training | 220 (55) | 31 (7.8) | 114 (28.5) | 35(8.8) | 0(0) |
| I make mistakes with negative consequences to patients | 278 (69.5) | 117 (29.3) | 5(1.3) | 0(0) | 0(0) |
| I fall short in the quality of care I provide to my patients | 117 (29.3) | 23 (5.8) | 207 (51.7) | 53(13.3) | 0(0) |
| I do not have enough time or attention to my patients | 207 (51.7) | 47 (11.8) | 132(33) | 4(1) | 10 (2.5) |
| I do not monitor the patient in the operating room as closely as I should | 279 (69.8) | 10 (2.5) | 94(23.5) | 13(3.3) | 4(1) |
| I have made medication errors involving the wrong drug or dose in the last year | 228 (57) | 167 (41.8) | 5(1.3) | 0(0) | 0(0) |

Table 3
Bivariate and multiple logistic regression analysis of Maslach Burnout Inventory scores among anesthetists.

| Variables          | Burnout | COR   | p-value | AOR   | p-value |
|--------------------|---------|-------|---------|-------|---------|
| Educational level  |         | 1.76  | 0.047   | 3.22  | 0.057   |
| BSc                | 1       | 1     |         | 1     |         |
| MSc                |         | 1.01-3.07 | 0.004 | 3.22 | 0.057  |
| Average years      | 1       | 1     |         | 1     |         |
| Experience(years)  | < 5     | 2.54  | 0.040   | 27.87 | <0.001  |
|                   | ≥ 5     | 1     |         | 1     |         |
| Parenthood status  | Yes     | 2.29  | 0.002   | 3.28  | 0.019   |
|                   | No      | 1.35-1.89 | 0.002 | 3.28 | 0.019  |
| Average drinks per week | ≥ 5 | 2.21 | 0.0163 | 5.23 | 0.021 |
|                   | < 5     | 1     |         | 1     |         |
| Academic role      | Yes     | 1.52  | 0.115   | 4.38  | 0.01   |
|                   | No      | 0.9-2.56 | 0.115 | 4.38 | 0.01  |

COR—Crude Odds Ratio, AOR = Adjusted Odds Ratio, I = constant.

Anesthetists exhibiting a high level of burnout reported more frequent mistakes with negative consequences to patients, performing procedures without appropriate training, and less attention to patients compared with anesthetists with no burnout syndromes (Table 4).

Table 4
Factors associated with burnout (adjusted odds ratio).

The level of burnout in this study was found to be lower than other studies in different groups of health professionals using the MBI-HSS scale which report prevalence ranging from 21% to 57% [2–5], yet was higher than findings from a Polish study conducted among anesthesiology providers with burnout in 12.06% [6], and a Brazil study of anesthesiologists with rates of 11.2% [3]. The differences may be attributed to, or influenced by, the differing career pathways and nature of the health-care ecosystems.

Previous studies have identified demographic variables such as experience, alcohol drinking habit, parenthood status, and academic roles as some of the predictive factors for a high level of burnout [3,5]. In line with these, our study found that having <5 years of work experience, consuming on average greater than or equal to 5 alcoholic drinks per week, working in an academic environment, and having children were all associated with burnout symptoms.

In contrast, some studies identified female sex [3], high workload [3], and young professionals age between 30 and 39 years as predictive factors for a high level of burnout. Anesthetists at risk of burnout are reported as having committed errors frequently and adhered to safety standards poorly [3,7]. Anesthetists at high risk of burnout also report more frequent medication errors [8]. In correlation with previous studies, our study found self-perceived medical errors and poor adherence with anesthesia practice standards were common in anesthetists who developed burnout syndromes. A high prevalence of burnout among health care professionals is of concern as it appears to affect quality, safety, and performance.

The strength of this study is the first in its kind by addressing the burnout syndrome in Ethiopian non-physician anesthetist and this study is limited by the constraints of self-reported surveys including accuracy dependent on thorough and reliable completion. Through utilizing the Ethiopian Association of Anesthetists’ common networking group, we were able to obtain a large sample size.

Considerable expansion of surgical services has taken place in Ethiopia over recent years, and despite capacity building initiatives there continues to be a shortage of anesthesia providers nationwide. The wellbeing of this limited anesthetic workforce is paramount to the delivery of safe anesthesia.

5. Conclusions

We found that non physician anesthetists working in Ethiopia is suffering by high levels of burnout. The problem is alarming in those working at academic environments and less experienced.

Ethical approval

Ethical approval was taken from Debre Tabor university.

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Author contribution

Tikuneh Yetneberk: participate in study concept or design, data collection, data analysis or interpretation, writing the paper. Meseret Firde: participate in study concept or design and data collection. Denberu Eshtie: participate in study concept or design, data collection and data analysis. Abebe Tirune: participate in study concept or design, data collection and interpretation. Jolene Moore: participate in study concept or design, data collection and writing the paper.
Table 4
Anesthetists self-reported errors and quality of care by the presence of burnout.

| Questions                                                                 | Burnout | Distribution of response, Number (% of a row) |
|---------------------------------------------------------------------------|---------|-----------------------------------------------|
| I make mistakes without negative consequences to patients                | Yes     | 0 (14.2)                                      |
|                                                                          | No      | 63 (79.2)                                     |
| I perform procedures without appropriate training                         | Yes     | 18 (26.1)                                     |
|                                                                          | No      | 202 (28.8)                                    |
| I make mistakes with negative consequences to patients                   | Yes     | 36 (52.5)                                     |
|                                                                          | No      | 242 (32.8)                                    |
| I fall short in the quality of care I provide to my patients             | Yes     | 10 (14.5)                                     |
|                                                                          | No      | 107 (15.3)                                    |
| I do not have enough time or attention to my patients                    | Yes     | 5 (7.2)                                       |
|                                                                          | No      | 202 (28.8)                                    |
| I do not monitor the patient in the operating room as closely as I should| Yes     | 60 (87)                                       |
|                                                                          | No      | 219 (62.2)                                    |
| I have made medication errors involving the wrong drug or dose in the last years | Yes | 18 (26.1) |
|                                                                          | No      | 210 (63.4)                                    |

Table 5
Performance of best practice of anesthesia by the presence of burnout.

| Questions                                                                 | Burnout | Distribution of response, Number (% of a row) |
|---------------------------------------------------------------------------|---------|-----------------------------------------------|
| Do you visit patients preoperatively?                                    | Yes     | 0 (14.2)                                      |
|                                                                          | No      | 5 (1.5)                                       |
| Do you check the results of preoperative investigations?                 | Yes     | 5 (1.5)                                       |
|                                                                          | No      | 51 (6.5)                                      |
| Do you read about the next day’s surgery and the patient’s disease?     | Yes     | 14 (4.2)                                      |
|                                                                          | No      | 43 (13)                                       |
| Do you perform a complete machine check at the beginning of the day?    | Yes     | 3 (4.3)                                       |
|                                                                          | No      | 26 (7.9)                                      |
| Do you double-check medication vials for correct administration?         | Yes     | 3 (4.3)                                       |
|                                                                          | No      | 26 (7.9)                                      |
| Do you make sure the monitor alarms are enabled before the administration of anesthesitics? | Yes | 0 (0) |
|                                                                          | No      | 37 (11.2)                                     |
| Do you confirm that surgery will be performed on the correct side?      | Yes     | 0 (0)                                         |
|                                                                          | No      | 0 (0)                                         |
| Do you wear a gown, gloves, and mask for spinal/epidurals?              | Yes     | 0 (0)                                         |
|                                                                          | No      | 51 (15.4)                                     |
| Do you review the postoperative conditions of your patient?             | Yes     | 0 (0)                                         |
|                                                                          | No      | 51 (15.4)                                     |

Registration of research studies

1. Name of the registry: Unique Identifying number or registration ID: researchregistry7086.
2. Hyperlink to your specific registration (must be publicly accessible and will be checked):

Guarantor
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None.

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Appendix A. Supplementary data
Supplementary data to this article can be found online at https://doi.org/10.1016/j.amsu.2021.102777.

References
[1] R.A.-R.A. Agha, E. Crossley, N. Dowlut, C. Iosifidis, G. Mathew, for the Strocss Group, The STROCSS 2019 guideline: strengthening the reporting of cohort studies in surgery, Int. J. Surg. 72 (2019) 156–165.
[2] M.P. Leiter, A.B. Bakker, C. Maslach, Burnout at Work: A Psychological Perspective, Psychology Press, 2014.
A. Biksegn, T. Kenfe, S. Matiwos, G. Eshetu, Burnout status at work among health care professionals in a tertiary hospital, Ethiopian journal of health sciences 26 (2) (2016) 101–108.

L. Moreira, C. Govêia, D. Miranda, M. Amorim, Burnout in anesthesiology: when exhaustion overcomes the duty, J Anesth Ther 1 (2) (2018).

A. Shah, M. Wyatt, B. Gourneau, G. Shih, M. De Ruyter, Emotional exhaustion among anesthesia providers at a tertiary care center assessed using the MBI burnout survey, Psychol. Health Med. (2018) 1–5.

L. Elbarazi, T. Loney, S. Yousef, A. Elias, 1485 Prevalence of and Factors Associated with Burnout Among Health Care Professionals in Arab Countries: a Systematic Review, BMJ Publishing Group Ltd, 2018.

F. Sanfilippo, A. Noto, G. Foresta, C. Santonocito, G.J. Palumbo, A. Arcadipane, et al., Incidence factors associated with burnout in anesthesiology: a systematic review, BioMed Res. Int. 2017 (2017).

L.N. Dyrbye, T.D. Shanafelt, C.A. Sinsky, P.F. Cipriano, J. Bhatt, A. Omnaya, et al., Burnout Among Health Care Professionals: a Call to Explore and Address This Underrecognized Threat to Safe, High-Quality Care, NAM perspectives, 2017.

N. Van der Walt, J. Scrivante, H. Perris, Burnout among anesthetists in South Africa, South. Afr. J. Anaesth. Analg. 21 (6) (2015) 169–172.

A.R.C. Sousa, J.J. de Barros Mourão, Burnout in anesthesiology, Brazilian Journal of Anesthesiology (English Edition) 68 (5) (2016) S57–S57.

G.S. De Oliveira, R. Chang, P.C. Fitzgerald, M.D. Almeida, L.S. Castro-Alves, S. Ahmad, et al., The prevalence of burnout and depression and their association with adherence to safety and practice standards: a survey of United States anesthesiology trainees, Anesth. Analg. 117 (1) (2013) 182–193.

P. Rama-Maceiras, J. Jokinen, P. Kranke, Stress and burnout in anaesthesia: a real world problem? Current Opinion in Anesthesiology 28 (2) (2015) 151–158.

H.-F. Zhang, F.-X. Li, H.-Y. Lei, S.-Y. Xu, Rising sudden death among anaesthesiologists in China, Br. J. Addict.ion: Br. J. Anesth. 119 (1) (2017) 167–169.

C.S. Dewa, D. Loong, S. Bonato, I. Trojanowski, M. Rea, The relationship between resident burnout and safety-related and acceptability-related quality of healthcare: a systematic literature review, BMC Med. Educ. 17 (1) (2017) 195.

F. Sanfilippo, A. Noto, G.J. Palumbo, M. Ippolito, M. Gagliardone, M. Scarlata, et al., Burnout in cardiac anesthesiologists: results from a national survey in Italy, J. Cardiothorac. Vasc. Anesth. 22 (6) (2018) 2459–2466.

S. Kibwana, M. Yigzaw, Y. Molla, J. van Roosmalen, J. Stekelenburg, Job satisfaction among anaesthetists in Ethiopia—a national cross-sectional study, Int. J. Health Plann. Manag. 33 (4) (2016) e966–e970.

A. Koh, S. Kibwana, Y. Molla, F. Ayalew, M. Teshome, J. van Roosmalen, et al., Factors predicting Ethiopian anaesthetists’ intention to leave their job, World J. Surg. (2018) 1–8.

C. Maslach, Maslach burnout inventory-human services survey (MBI-HSS), MBI manual (1996) 192–198.

L. Azi, I. Oliveira, J. Santos, Abstract PR471: prevalence of burnout syndrome in anesthesiologists in Brazil, Anesth. Analg. 123 (35) (2016) 591.

G.S. De Oliveira Jr., R. Chang, P.C. Fitzgerald, M.D. Almeida, L.S. Castro-Alves, S. Ahmad, et al., The prevalence of burnout and depression and their association with adherence to safety and practice standards: a survey of United States anesthesiology trainees, Anesth. Analg. 117 (1) (2013) 182–193.