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RESEARCH ARTICLE

Assessing Patient Safety Culture: Application of the Safety Attitudes Questionnaire in a Kenyan Setting

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Abstract:

Background:

Patient safety has recently been declared a global health priority. Achievement and sustenance of a culture of patient safety require a regular and timely assessment of the organization. The Safety Attitudes Questionnaire is a patient safety culture assessment tool whose usefulness has been established in countries, but a few studies have been published from Africa, more so, in Kenyan settings.

Objective:

To evaluate the reliability of the Safety Attitudes Questionnaire in assessing the patient safety culture in a Kenyan setting and to assess healthcare workers' perceptions of patient safety culture.

Methods:

A descriptive quantitative approach was utilized whereby the Safety Attitudes Questionnaire was administered to 241 healthcare workers in two public hospitals. The Cronbach's α was calculated to determine the internal consistency of the SAQ. Descriptive and inferential statistics were used to analyze and describe the data on patient safety culture.

Results:

The total scale Cronbach's alpha of the SAQ was 0.86, while that of the six dimensions was 0.65 to 0.90. The overall mean score of the total SAQ was 65.8 (9.9). Participants had the highest positive perception for Job Satisfaction with a mean score of 78.3 (16.1) while the lowest was evaluated for Stress Recognition with a mean score of 53.8 (28.6).

Conclusion:

The SAQ demonstrated satisfactory internal consistency and is suitable for use in the Kenyan context. The perception of patient safety culture in the Kenyan hospital is below international recommendations. There is a need for implementation of strategies for the improvement of the organization culture in Kenyan hospitals.

Keywords: Patient safety culture, Healthcare workers, Kenya public hospitals, Safety attitude, Low and middle income country, Organization culture.

Article History

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1. INTRODUCTION

Patient safety has recently been recognized by the World Health Organization (WHO) as a global health priority and its role in strengthening health care systems in order to achieve universal health coverage cannot be overlooked [1]. The safety of the healthcare systems has been a public health concern

since the 1999 Institute of Medicine report, "To Err is Human", which highlighted that medical errors were a major cause of morbidity and mortality in hospitals [2]. Patient safety requires that health care organizations provide the right care for the right patient at the right time and that no harm comes to the patient due to errors of commission or omission [3]. Patient safety in Kenya remains a challenge with an increasing number of medical errors being reported in the media [4, 5]. However, there are no official statistics on the extent of patient safety

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issues in Kenya. In 2012, the Ministry of Health in conjunction with the World Bank conducted an assessment of patient safety at Kenyan health facilities. It was found that only less than one percent of the public health facilities complied with the minimum patient safety standards (Ministry of Health, 2013).

Patient safety can be achieved in healthcare organizations by implementing improvement measures to ensure that patients do not come to any harm while they are under their care and also ensuring that there is a just culture of trust, transparency, and discipline [7]. Patient safety culture is a complex framework relating to shared social aspects of an organization with various dimensions that guide the patient safety behaviors [8]. These dimensions include the visible manifestations of the healthcare organization, the values, beliefs, and norms about what is important in an organization, and the deeper shared assumptions that are pervasive among the health care workers as well as the patients [9]. Three main components have been identified as key to the development of a patient safety culture: learning culture, just culture, and reporting culture [10]. A learning culture is one whereby the organization tracks its safety issues, analyses and reports them while ensuring that they learn from their failures and their successes. A just culture is one where the staff shares a belief that justice will be served when an error occurs and is also able to differentiate when to punish and when to offer immunity [11]. A reporting culture provides opportunities for healthcare workers and patients to identify report errors and safety issues while learning from them and preventing the occurrence of harm [12].

Sustenance of a safety culture in healthcare organizations requires a regular and timely assessment of their cultures. This allows the organizations to gain insight and an understanding of their cultures as well as to get a critical closer look at their strengths and limitations [13]. Therefore to be able to improve the patient safety culture and patient safety practices in the organization, the first step is to assess the system, which is mostly achieved through the use of quantitative methods [14, 15]. Numerous different assessment tools are used around the world, each of which is based on a combination of dimensions. The most commonly used tools include the Agency for Healthcare Research and Quality Hospital Survey on Patient Safety Culture [16], the Safety Attitude Questionnaire [17] the Manchester Patient Safety Culture Assessment Tool [18], and Modified Stanford Instrument Patient Safety Culture Survey [19].

To assess patient safety culture, these tools extrapolate from the perceptions of the staff towards the various dimensions of patient safety culture and therefore, assessing the patient safety culture by using any of the tools requires the determination of whether the tool is appropriate for that setting [20]. Based on these recommendations, this study aimed to evaluate if the Safety Attitudes Questionnaire (SAQ) is appropriate for use in a Kenyan setting. The SAQ was developed by Sexton et al. [17] based on a set of pilot studies carried out in the UK, USA, and New Zealand. As a result of a series of item and content analyses, reliability analysis, and exploratory and confirmatory factor analyses, Sexton, et al. developed a 30 item tool that was grouped into six patient safety dimensions. The fit of the final model containing the 30

items was generally satisfactory, and Cronbach alpha for the SAQ was 90, indicating strong reliability of the SAQ. Subsequently, the SAQ has been used extensively around the world and has been translated and validated for use in various countries, mainly in the High Income Countries [21 - 24]. However, the usage of the tool in Lower and Middle Income Countries (LMICs) remains low with only a few published studies identified. Additionally, in the literature review, no published research study using the SAQ was identified in Kenya. Therefore this study was guided by the questions: Is the SAQ suitable for assessing the patient safety culture in a Kenyan setting? If suitable, what are the healthcare workers' perceptions of patient safety culture in their hospitals? The objectives of the study were to assess the reliability of the SAQ in assessing patient safety culture in a Kenyan setting and to assess the healthcare workers' perceptions of patient safety culture in their hospitals.

2. MATERIALS AND METHODS

2.1. Study Design and Site

This was a cross-sectional descriptive study which formed part of a larger three-phase mixed methods study project that was conducted in two public universities and two public county hospitals. This paper reports the quantitative part of the third phase of the mixed methods study whereby the researcher assessed the patient safety culture of the organization in the two public hospitals - Coast General Teaching & Referral Hospital (CGH) and Kakamega County General Teaching & Referral Hospital (KCH). These are both level five hospitals meaning that they serve as regional referral facilities for the lower levels providing more comprehensive health care services for a larger catchment area. These hospitals are governed by their respective county governments [25].

2.2. Population and Sample

The population for this study was the healthcare workers in the two hospitals, primarily the doctors, clinical officers and nurses. The researcher's rationale for the inclusion of the three occupational groups was that in the healthcare system, the three groups have the most frequent interaction in patient care and usually function as a team which is a major dimension of patient safety culture. Furthermore, the nurses were then categorized as either nurse managers or staff nurses. The nurse managers are mid-level managers involved in day to day running of the unit while the staff nurses are nurses providing direct patient care. With a population size of 729, the researchers calculated a sample size of 277 at a 95% confidence level, a margin of error of equal to or less than 5% and a non-response rate of 10%. Simple random sampling was used to get a representative sample of the healthcare workers in the hospitals. A list of the eligible healthcare workers was obtained from the hospitals. Those who were on leave during the data collection period were excluded from the list. Random numbers were generated and assigned to each healthcare participants on the list who were then chosen as the study participants.

2.3. Study Instrument

The SAQ, which is a closed-ended questionnaire was used for this study. The questionnaire was divided into two parts - the first part collected data on the demographic characteristics of the participants. The second part was the 36-item questionnaire that measured patient safety culture on six dimensions - teamwork climate (6 items); job satisfaction (5 items), perceptions of management (6 items responded to separately for the hospital and ward unit management); safety climate (7 items); working conditions (4 items); and stress recognition (3 items). Also, the tool contains five additional items that are not part of the six dimensions, therefore, yielding a total of 41 items. All the items were answered following a five-level Likert scale which was coded as 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree. Three items were negatively worded and therefore were reverse scored. As per the instructions of the authors of the instrument, the final scores were reported on a 100 point score. The computation of the 100-point scores for each dimension was done by calculating the mean of each set of items in the dimension, one was then subtracted from the mean and the result was multiplied by 25. The scores ranged between 0 to 100 where zero showed a strong disagreement and 100 showed a strong agreement with the items in the dimension. Values were considered positive when the total scale score was equal to or higher than 75.

2.4. Data Collection and Procedure

Data collection was conducted between January and April 2017. The paper-based questionnaire, which was self-administered, was distributed by the research assistants to the respective participants in different units of the two hospitals during their break times. Prior to completion of questionnaires, the research assistants requested the participant to read and understand the information provided on the front page of the questionnaire. If they agreed, then they were required to sign and date the consent form. For the anonymity of the participants, a serial number was allocated to each questionnaire for data entry purposes.

2.5. Statistical Analysis

Data entry and analysis was done using a data matrix created on the IBM SPSS version 21.0. To evaluate the reliability of the SAQ, the internal consistency was tested using the Cronbach's α coefficient and the correlation between the items in the dimensions and the total score of the SAQ was also calculated. Descriptive statistics were used to analyze and describe the demographic data of the participants and the scores of the SAQ dimensions. Frequency counts and percentages were used to describe the participant characteristics while mean and standard deviations were used to summarize the scores. For the patient safety culture assessment, an independent sample T-test was used to compare the SAQ mean scores between genders and the type of hospital. One-way ANOVA test was used to compare the mean scores of more than two categorical groups and Tukey's post hoc tests were conducted to identify the differences when the ANOVAs were significant. All analyses used a significance level of $p < 0.05$ and a 95% confidence interval.

2.6. Ethical Considerations

Ethical clearance was obtained from the University of South Africa (HSHDC/386/2014) and Pwani University (ERC/PhD/008/2016). The researcher also got permission to conduct the study from the respective hospital boards in which the study was being conducted. A participant informed consent form was attached to the front of each survey tool which outlined what the research was about, the identity of the researcher, the role of the participant, the purpose of the research, the anticipated risks and benefits and assurance of anonymity, confidentiality and voluntary participation.

3. RESULTS

3.1. Characteristics of the Participants

Of the expected 277 questionnaires, a total of 241 (87%) were returned. The returned questionnaires were screened for missing content. Seven of the questionnaires had more than 70% of the responses missing, and therefore were not included in the final analysis, leaving 234 (84.5%) valid questionnaires. Key demographic data that was obtained from the participants' included gender, age, occupation, and work experience which are summarized in Table 1. More than half of the participants were female at 59.4% ($n = 139$), 45.3% ($n=106$) and were aged between 25 to 34 years. The majority of the healthcare workers who participated in the survey were staff nurses ($n = 122$, 52.1%) while the majority had clinical experience of between one to five years ($n = 93$, 39.7%).

3.2. Reliability of the SAQ

The total scale Cronbach's α of the SAQ was 0.86, showing good internal consistency. The internal consistency of the six dimensions had Cronbach's α values of 0.65 to 0.90. Stress recognition dimension had the highest Cronbach's α values, and work perception had the lowest value (Table 2).

The intercorrelation factor of the SAQ in this study was moderate to strong as shown in Table 3. There was a significant correlation of each dimension with the total which ranged from 0.54 to 0.76, with the exception of the Stress Recognition dimension, which showed low item-total correlation (0.21).

3.3. SAQ mean Scores Across Demographic Factors

The overall mean SAQ score of the participants and a comparison of the score made across the demographic factors are presented in Table 4. The overall mean score was 65.8 (9.9) with the highest score reported for the Job Satisfaction dimension 78.3 (16.1) while the lowest was of Stress Recognition with a mean score of 53.8 (28.6). In the total SAQ mean score, no significant difference was found across the groups. However in Teamwork Climate, there were significant differences between the hospitals ($t = 4.75$, $p = 0.00$), occupation ($F = 5.04$, $p = 0.002$), and years of experience ($F = 3.84$, $p = 0.01$). In the Safety Climate dimension, significant differences were found in the hospital means ($t = 2.99$, $p = 0.003$) with KCH having a significantly higher mean than CGH. There was a significant difference in the safety climate perceptions between the different occupations ($F = 3.60$, $p =$

0.01) with post hoc tests showing that the means of the nurse managers and the staff nurses were significantly higher than those of the clinical officers. In Stress Recognition, there was a statistically significant difference between the means of the hospitals ($t = 7.66, p = 0.00$) and years of experience ($F = 3.18, p = 0.02$). In Perception of Management, the only significant difference was found in the mean scores of the hospitals ($t = 1.97, p = 0.05$) with CGH having a significantly more positive perception of the unit and hospital management than KCH. In the Work Conditions dimension, significant differences were found in the hospital means ($t = 4.07, p = 0.00$) with CGH having a significantly more positive perception of the work conditions in their hospital.

4. DISCUSSION

Although the SAQ has been implemented in multiple hospital environments, to our knowledge, this is the first

application of the SAQ to a Kenyan hospital and therefore it was important to ascertain that it was suitable for use in this setting. The statistical analysis carried out on the reliability of the SAQ in a Kenyan setting showed that the tool had an acceptable internal consistency [26, 27] and also that it performed in the same way as in other reliability and validation studies in different countries [23, 28, 29]. In addition, the Cronbach's α observed in the items in the six dimensions were acceptable. The correlations between the dimensions were moderate to strong, with the exception of the Stress Recognition dimension which was poorly correlated with the other dimensions; a result that is consistent with other reliability studies [30, 31]. These results therefore are indicative that the tool is capable of assessing the healthcare workers' perception of patient safety in a Kenyan setting; however, the dissonance in the Stress Recognition dimension may require that it is analyzed separately from the total SAQ mean score as suggested by some researchers [32].

Table 1. Demographic characteristics (N = 234).

Item	n	%
Hospital		
CGH	93	39.7%
KCH	141	60.3%
Gender		
Male	95	40.6%
Female	139	59.4%
Age		
18 - 24	56	23.9%
25 - 34	106	45.3%
35 - 44	30	12.8%
45 -54	27	11.5%
55 -64	15	6.4%
Occupation		
Doctors	49	20.9%
Nurse manager	26	11.1%
Staff Nurses	122	52.1%
Clinical officer	37	15.8%
Clinical Experience		
Less than 1 year	61	26.1%
1 - 5years	93	39.7%
6- 10years	39	16.7%
11years or more	41	17.5%

Table 2. Cronbach's α coefficient of the SAQ.

Total SAQ and dimensions	Number of Items	Cronbach's α
Total SAQ	41	0.86
Teamwork Climate (TW)	6	0.70
Safety Climate (SC)	7	0.70
Job Satisfaction (JS)	5	0.82
Stress Recognition (SR)	4	0.90
Perceptions of management (PM)	10	0.80
Work Conditions (WC)	3	0.65

Table 3. Correlation coefficient between dimensions and the total SAQ.

Dimensions	TW	SC	JS	SR	PM	WC
TW	-	-	-	-	-	-
SC	0.69**	-	-	-	-	-
JS	0.33**	0.48**	-	-	-	-
SR	0.25**	0.11	-0.06	-	-	-
PM	0.28**	0.33**	0.51**	-0.17*	-	-
WC	0.24**	0.28**	0.29**	-0.25**	0.46**	-
Total SAQ	0.72**	0.76**	0.68**	0.21**	0.71**	0.54**
<i>p < 0.05 ** p < 0.01</i>						

Table 4. Comparison of SAQ mean scores across demographic factors (N = 234)

Dimensions	Overall SAQ	TW	SC	JS	SR	PM	WC
Mean (SD)	65.8 (9.9)	69.9 (15.4)	64.9 (14.8)	78.3 (16.1)	53.8 (28.6)	64.4 (13.9)	57.5 (18.6)
Gender							
Male	65.4 (9.3)	67.9 (16.3)	64.2 (15.2)	78.1 (15.6)	54.4 (28.3)	64.1 (11.7)	56.9 (17.9)
Female	66.0 (10.3)	71.2 (14.6)	65.5 (14.6)	78.5 (16.5)	53.4 (28.9)	64.7 (15.3)	57.9 (19.1)
<i>t</i>	-0.50	-1.64	-0.62	-0.16	0.26	-0.29	-0.40
<i>p</i>	0.62	0.1	0.54	0.87	0.79	0.77	0.69
Hospital							
CGH	64.9 (8.3)	66.1 (14.1)	62.7 (13.5)	78.6 (14.4)	42.9 (6.7)	65.9 (11.6)	61.4 (15.8)
KCH	67.1 (11.9)	75.5 (15.6)	68.5 (16.0)	77.9 (18.4)	69.3 (3.6)	62.2 (16.6)	51.6 (20.8)
<i>t</i>	-1.68	-4.75	-2.99	0.32	-7.66	1.97	4.07
<i>p</i>	0.1	0.00**	0.00**	0.75	0.00**	0.05*	0.00**
Age in years							
18 - 24	67.2 (7.9)	70.0 (12.7)	66.8 (12.2)	80.4 (13.0)	55.7 (27.6)	64.8 (13.5)	60.6 (17.9)
25 - 34	64.4 (9.8)	68.6 (16.6)	62.2 (15.1)	77.1 (16.1)	50.3 (28.8)	64.4 (13.2)	57.2 (17.4)
35 - 44	66.2 (10.2)	68.5 (15.7)	66.7 (16.2)	77.8 (15.1)	61.9 (31.1)	62.8 (12.7)	57.3 (19.2)
45 -54	66.5 (14.0)	70.9 (16.9)	68.1 (17.5)	77.6 (23.1)	56.9 (26.5)	65.4 (15.6)	55.3 (21.3)
55 -64	67.8 (8.0)	78.6 (9.3)	68.8 (11.2)	81.6 (14.2)	48.8 (27.9)	65.0 (19.7)	52.9 (23.1)
<i>F</i>	0.97	1.49	1.85	0.57	1.24	0.15	0.72
<i>p</i>	0.43	0.21	0.12	0.69	0.29	0.96	0.58
Occupation							
Doctor	66.6 (7.5)	68.8 (11.8)	65.3 (14.3)	80.6 (11.3)	45.3 (26.5)	67.6 (8.7)	60.7 (13.9)
Nurse Manager	68.3 (9.8)	73.4 (13.4)	70.0 (12.9)	79.9 (13.3)	59.0 (32.1)	65.7 (13.8)	61.3 (23.5)
Staff Nurse	65.9 (10.7)	72.0 (15.0)	65.7 (15.2)	77.7 (17.5)	56.9 (27.9)	63.5 (16.3)	55.9 (19.7)
Clinical officer	62.4 (9.4)	61.7 (19.3)	58.5 (13.7)	76.3 (18.5)	50.7 (29.3)	62.5 (9.7)	56.0 (16.0)
<i>F</i>	2.13	5.04	3.60	0.68	2.27	1.38	1.24
<i>p</i>	0.1	0.00**	0.01*	0.56	0.08	0.25	0.29
Years of experience							
< 1	64.3 (7.3)	65.9 (11.4)	62.0 (11.7)	77.2 (11.7)	51.5 (29.6)	64.1 (11.5)	58.5 (15.9)
1 – 5	65.8 (9.9)	68.9 (17.0)	64.3 (15.7)	78.6 (15.3)	50.3 (28.4)	65.3 (13.7)	60.3 (19.4)
06-Oct	66.3 (10.8)	72.6 (13.9)	66.1 (14.6)	78.2 (19.7)	52.3 (26.9)	65.5 (13.7)	55.9 (18.6)
11 ≥	67.4 (12.2)	75.4 (16.5)	69.8 (16.2)	79.3 (19.7)	66.0 (26.9)	61.9 (17.4)	51.4 (19.5)
<i>F</i>	0.84	3.84	2.46	0.16	3.18	0.67	2.33
<i>p</i>	0.47	0.01*	0.06	0.92	0.02*	0.57	0.07
<i>* p < 0.05 ** P < 0.01</i>							

The overall mean SAQ score reported indicated that the healthcare workers had a positive perception of patient safety culture. However, the perception was still below the recommended value by the authors of the tool which is 75 and above [17]. Nevertheless, the score was comparable with the

benchmark data (60.0) as well as scores reported in other studies [33 - 35]. This finding is indicative of the state of patient safety in the Kenyan health system as well as most of the developing countries where patient safety is not given enough attention. In Kenya, the concerns surrounding patient

safety are immense however in the past, the country has been grappling with issues of poverty and the challenges from infectious diseases including HIV/AIDS. The focus of the policymakers has therefore largely been on dealing with these issues. Recently there has been a shift in the focus in Kenya with patient safety starting to receive the attention it deserves [36].

In the dimensions, Job Satisfaction had the highest positive attitude through which most of the participants indicated that they liked their jobs, were proud to be working in the respective hospitals and that the morale was very high in the work units. The two lowest scored dimensions were Work Conditions and Stress Recognition. Positive working conditions are one of the cornerstones of patient safety. Studies have shown that in positive work conditions, the employees report higher job satisfaction and motivation, reduced stress levels, and better patient safety [37, 38]. Poor working conditions have been reported in studies on the Kenyan public health systems [39] as well as globally [40, 41]. The healthcare workers' perceptions of poor working conditions in this study were reflective of the challenges faced by the Kenyan public health sector which has experienced frequent local and nationwide strikes by healthcare workers agitating for better working conditions and remuneration [42, 43]. Stress recognition dimension, when analyzed on its own, was lowly scored which has also been reported in other studies [44]. This finding indicates that the participants were not greatly aware of how factors such as stress, fatigue, excessive workload and tense or hostile situations can foster the occurrence of error. Human factors approach to understanding the nature of adverse events recognizes the role of the interrelationship between the healthcare worker, the organizational factors, and the environment in which they work as a fundamental aspect in the prevention of errors in healthcare [45]. At the individual level, psychological factors that are key in shaping the person safety related behavior include stress and fatigue. Stress and fatigue in health workers are occupational factors that have also been reported in healthcare workers globally [46]. Long working hours, and excessive workloads have been linked with fatigue and poor performance by the health workers which ultimately predisposes to the occurrence of an adverse event and compromises the wellbeing of the worker [47]. Stress and failure to cope with stressors have also been linked to poor patient safety outcomes [48, 49]. Therefore it is important that healthcare workers are aware of, and recognize signs, symptoms and responses to, personal fatigue and the occupational stressors so as to mitigate the occurrence of adverse events.

Across the demographic factors, certain dimensions showed significant differences however for the overall perception of patient safety, demographic factors did not show any significant influence. In the Teamwork and Work Conditions dimensions, there were significant differences between the hospitals. This difference can be explained by a devolved system of health services management in Kenya which was introduced following the promulgation of the new constitution in 2010 which devolved the primary and secondary health care services to semiautonomous county governments [50]. The devolution of the management of the hospitals

therefore has reduced the homogeneity of the hospitals based on the availability of resources and management styles of the different county governments. The years of experience also show a significant difference in the Teamwork and Stress Recognition dimensions with higher scores being reported by those with more years of experience as compared to those with fewer years in both dimensions as reported in other studies [21]

The limitations of this study were related to the sample size, which limits its generalizability. The selection of the two hospitals was made conveniently as this study formed part of a more extensive mixed-methods study. The two were also public hospitals, and therefore, the findings cannot be generalized to the private hospitals. Also, despite having good content and face validity, the construct validity of the tool was not determined in this setting. Nonetheless, the study is strengthened by the high response rate, satisfactory reliability scores of the tool in the setting, and the use of a widely used and validated tool for the study.

CONCLUSION

The satisfactory results of the reliability testing indicated that the SAQ was capable of assessing the health workers' perception of patient safety culture in a Kenyan context and can be used to benchmark with international standards. However, it is advised that the users of the tool test the construct validity of the tool in the Kenyan setting. Additionally, it is essential for users of the tool to recognize that they may require to ensure that the respondents of the questionnaire have an understanding of what the Stress Recognition dimension intends to measure as opposed to the other aspects of the questionnaire. The low perception of patient safety culture in this study was indicative that there is a need for concerted efforts to improve patient safety culture in the hospitals. The high job satisfaction levels in this study should be fostered in the hospitals and supported by improving the working conditions of the health workers for improved patient safety. The healthcare workers in this study reported low stress recognition levels indicating that hospitals need to implement strategies to sensitize health workers on how to recognize personal fatigue and the occupational stressors to mitigate the occurrence of adverse events.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from the University of South Africa (HSHDC/386/2014) and Pwani University (ERC/PhD/008/2016) South Africa. Permission to conduct the study was attained from the respective hospital boards in which the study was being conducted.

HUMAN AND ANIMAL RIGHTS

Not applicable

CONSENT FOR PUBLICATION

The participants provided consent for participation and publication.

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from the corresponding author, [N.M], upon reasonable request.

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CONFLICT OF INTEREST

The author declares no conflict of interest, financial or otherwise.

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