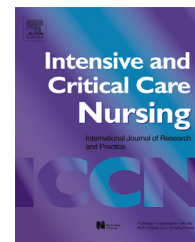




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ORIGINAL ARTICLE

A study on reliability and validity of the Turkish version of the Face Anxiety Scale on mechanically-ventilated patients



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Accepted 11 May 2016

KEYWORDS

Anxiety;
Cardiovascular surgery (CVS);
Intensive care unit (ICU);
Mechanical ventilator

Summary Mechanical ventilation treatment causes patient anxiety, such that for those people dependent on mechanical ventilation, it was suggested to self-evaluate anxiety levels using a scale. The aim of this study was to assess the reliability and validity of the Turkish version of the Face Anxiety Scale in order to evaluate general patient anxiety levels for those receiving mechanical ventilation in a cardiovascular surgery (CVS) intensive care unit (ICU). A survey was conducted between April and December 2015 with 99 patients in receipt of mechanical ventilation at the CVS-ICU of a military training hospital in Turkey. Patients' average age was 59.31 ± 16.47 years (range 18–83 years), with 73.7% for males and 73.7% for those undergoing coronary artery bypass graft surgery. The average scores from the Face Anxiety Scale were 2.8 ± 1.3 . A statistically significant (positive) correlation was found between scores from the test and retest ($r = 0.87, p < 0.001$), which indicated that the scale was reliable. The relationship between the Face Anxiety Scale and Profile of the Mood States (POMS) of participants scored 0.89, corroborating the validity of the former ($p < 0.001$). This study found that it was valuable for evaluating patient anxiety in those receiving mechanical ventilation.

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Implications for Clinical Practice

- Patients who are in need of mechanical ventilation in the ICU suffer from anxiety. Accurate evaluation of this anxiety is highly important.
- Patient anxiety levels reflect the ones who are receiving mechanical ventilation treatment in ICUs; they should be evaluated using objective scales that are valid and reliable.
- The Face Anxiety Scale was found to be a dependable instrument in this study, and may be used to objectively evaluate anxiety levels for those who need mechanical ventilation, as it offers both precision and ease of use in ICUs.
- Accurate evaluation of these patients will also enable health professionals to provide more effective psycho-social care for managing anxiety.

Introduction

ICUs are clinical units with high levels of morbidity and mortality, where patients with complex and life-threatening illnesses are treated, and where invasive and the non-invasive surgeries are carried out. Treatments such as mechanical ventilation and endotracheal aspiration are frequently applied for patients in ICU; however, they can result in raised levels of fear and anxiety for many patients (Tracy and Chlan, 2011). Various studies have found that the use of mechanical ventilation resulted in high levels of patient anxiety (Chlan, 2004, 2009; Nilsson, 2011; Claesson et al., 2005; Arslanian-Engoren and Scott, 2003; Patak et al., 2004; McKinley et al., 2002, 2003, 2004; Perpina-Galvan and Richart-Martinez, 2009; Perpina-Galvan et al., 2013; Tracy and Chlan, 2011; Saadatmand et al., 2013; Baumgarten and Poulsen, 2015).

In their studies, Li et al. (2009), Rotondi et al. (2002), Saadatmand et al. (2013) stated that anxiety is the most common symptom of patients receiving mechanical ventilation. They suffer from anxiety, in that they are unable to state their emotions, ideas, and needs (Wojnicki-Johansson, 2001; Tracy and Chlan, 2011; Karlsson et al., 2012). Holm and Dreyer (2015), found that patients evaluated ventilation as nauseating and unpleasant and that they considered the endotracheal tube to be an unusual sensation. Furthermore, anxiety can be caused by thirst, sleeplessness, pain, disappointment, immobility, mental confusion, loneliness, despair, sensory deprivation, endotracheal aspiration, change in position or the inability of the patient to synchronise respiration with the ventilator (Chlan, 2004, 2009; Li et al., 2009). A meta-analysis of patient experiences of mechanical ventilation ventilation found that it caused patients to lose control, and consequently made them feel insecure and anxious (Baumgarten and Poulsen, 2015). The study of Tate et al. (2012) on anxiety and agitation levels of those receiving mechanical ventilation found that patients worried about breathlessness and choking, in such a way as to heighten anxiety. During mechanical ventilation, activities such as endotracheal aspiration or change in position may increase patients' anxiety levels (Li et al., 2009), which in turn causes immune responses to decrease in terms of heart rate, blood pressure, respiratory rate, coagulability and myocardial workload to finally stabilise (McKinley et al., 2004; Tate et al., 2012; Salamon et al., 2003). Certain body movements, including tensing facial muscles, grimacing, resisting care, withdrawing, thrashing, restlessness and wincing are behavioural signs of anxiety (Tate et al., 2012).

ICU patients with anxiety may demonstrate some or most of these symptoms.

Anxiety negatively affects the treatment process and creates fatigue by decreasing the patient's physical and emotional energy (Gagner-Tjellesen et al., 2001). It may result in fear, chronic pain, communication difficulties and sleep disorders (Tracy and Chlan, 2011). Evaluation of patient anxiety levels and concomitant attempts to reduce it are important clinical targets that ICU personnel must consider. This is a difficult task, since responses to anxiety differ from patient to patient. The study of O'Brien et al. (2001) found no relationship between anxiety levels scored by nurses and the patients themselves. The use of scales for patients to measure anxiety themselves was suggested as the best way to determine accurate anxiety levels (Frazier et al., 2002). The use of scales that the patients can easily interpret are based on their own statements, are suggested (Tate et al., 2012).

Various scales have been used to determine anxiety levels of ICU patients. The Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983), Spielberger State-Trait Anxiety Inventory (STAI) (Marteau and Bekker, 1992), Edmonton Symptom Assessment System (ESAS) (Bruera et al., 1991) constitute examples of anxiety scales. However, since the patients receiving mechanical ventilators are unable to speak, their responses with existing scales are limited (McKinley et al., 2004). The Face Anxiety Scale, developed by McKinley et al. (2003), is an instrument used by patients to evaluate their own anxiety levels. The scale works on an 11 × 42 cm card and is composed of five face types. The face type in the left-hand corner indicates an absence of anxiety, while anxiety increases towards the faces in the right-hand corner (Fig. 1). When patient scores were three or above, their anxiety was determined to be medium to high (McKinley et al., 2004).

The Face Anxiety Scale has been assessed for patients using invasive and noninvasive ventilation (McKinley et al., 2004). Following this study, we aimed to evaluate the extent to which the Face Anxiety Scale is indicated for patients receiving mechanical ventilation in ICUs who had previously undergone heart surgery.

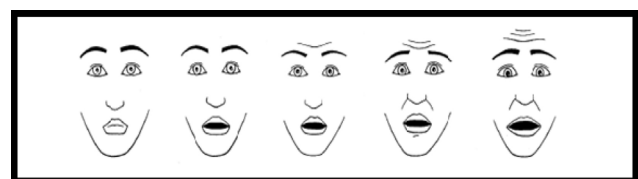


Figure 1 Face Anxiety Scale.

Aim

The aim of this research was to assess the integrity of the Face Anxiety Scale to evaluate patient anxiety, for patients in receipt of mechanical ventilation in the CVS-ICU of a military training hospital in Turkey.

Method

Study design

This procedural study was conducted with patients receiving mechanical ventilation at the CVS-ICU of the military training hospital between April and December of 2015.

Sample

The sample of this study was comprised of all patients receiving mechanical ventilation at the CVS-ICU of the military training hospital between April and December 2015 ($N=124$). While calculating the sample size, we assumed no match when the correlation between any two scales was <0.05 and measured 77 for the sample size. All patients who conformed to the sampling criteria were included in the study ($N=99$).

The sampling criteria of the study were the following:

- Agreement to participate in the research
- Ability to speak in Turkish
- Age above 18
- In receipt of mechanical ventilation
- Not being diagnosed with neurological or psychological disorders
- Having a sedation level of three and above from the Ramsey Sedation Scale (opens his/her eyes when the name is loudly spoken, no external stimulus is required to open his/her eyes, or to stay awake).

Exclusion criteria

- Not having the critical eligibility criteria
- Receiving mechanical ventilation treatment beforehand
- Refusing to take part in the study at any stage.

Data collection tool

We used a data collection form to amass demographic characteristics of patients, including the Face Anxiety Scale and POMS to measure the construct validity of the former Face Anxiety Scale.

McNair et al. developed POMS in 1971 to describe and evaluate the contextual and short-term changes of a patient's emotional mood (McNair et al., 1971). The dependability of the profile has been evaluated by Agargun et al. in 2003 and the Cronbach α was 0.85. In this study, we used the tension-anxiety subscale (Agargun et al., 2003). The highest score was 25 and the lowest was 11. We found the Cronbach α of the profile to be 0.94

Procedures

Before this study, we obtained the necessary permission via email from Stein-Parbury, one of the authors of the article, in order to translate and adapt the Face Anxiety Scale to Turkish. We also obtained the necessary permission from the Ethical Board Committee of the institution in which the research was conducted.

During the preoperative period, patients who were eligible to participate in the research were informed about the study and their consent was obtained. During the post-operative period, the Face Anxiety Scale and POMS were applied to those patients receiving mechanical ventilation when they recovered and were conscious (three and above, according to the Ramsey Sedation Scale (RSS)). While filling out the face anxiety form, patients were asked to indicate the face that most closely resembled how they felt. While filling out the POMS, items related to anxiety were read aloud and patients were asked the extent to which they felt specific emotions. Again, as our participants were unable to speak, they were asked to answer by using their heads or a hand-thumb combination. The retest of the Face Anxiety Scale was conducted 15 minutes after the first test.

Analysis

SPSS version 15.0 (Chicago, IL, USA) was used for data analysis. Number, frequency (%), plus mean and standard deviation were used as descriptive statistics. *T*-test and Pearson correlation coefficients were used for test–retest reliability. The Pearson correlation coefficient was also used to analyse the relationship between anxiety scores from the Face Anxiety Scale and POMS to measure construct validity, with $p < 0.05$ indicating a statistically meaningful relationship.

Results

Table 1 demonstrates the descriptive characteristics of the patients: they were mostly men (73.7%), the mean age was 59.31 ± 16.47 years (range 18–83 years), 76.8% of the patients were married, 52.5% were graduates of primary school and 73.7% had undergone coronary artery bypass graft surgery. Mean pain scores for patients receiving mechanical ventilation were 4.66 ± 2.63 . Several patients suffered from hypertension (45.5%) and diabetes (34.3%) (not shown in table).

Table 2 shows the patient anxiety scores, with the average score from the Face Anxiety Scale being 2.8 ± 1.3 . Average scores obtained from the POMS were 16.5 ± 5.8 .

Reliability – ‘‘Test–Retest reliability’’

Correlation analysis was conducted to evaluate test–retest reliability and indicated a significant positive correlation for test and retest scores obtained from patients. Its reliability was both high and compatible in retest ($r=0.88$, $p=0.001$) (Table 3). The paired sample *T*-test between the test and the

Table 1 Patients' characteristics (N = 99).

	n	%
Characteristics		
≤65	53	53.5
≥66	46	46.5
Gender		
Female	26	26.3
Male	73	73.7
Marital status		
Single	23	23.2
Married	76	76.8
Education status		
Illiterate	9	9.1
Elementary school	52	52.5
High school	27	27.3
College	11	11.1
Chronic diseases		
Yes	58	58.6
No	41	41.4
Surgery		
Open CABG ^a	73	73.7
Open heart valve surgery	10	10.1
Aneurysm surgery	5	5.1
MIRC ^b CABG	1	1.0
MIRC ASD ^c surgery	4	4.0
MIRC heart valve surgery	2	2.0
Neocard surgery	4	4.0
Pain score for the patients under mechanical ventilator (mean = 4.66 ± 2.63, range = 0–10)		

SD, standard deviation.

^a Coronary artery bypass graft.

^b Minimally invasive and robotic cardiovascular surgery.

^c Atrial septal defect.

Table 2 Anxiety scores.

	Face Anxiety Scale	Profile of the Mood States Scale
Score		
Mean (SD)	2.8 (1.3)	16.5 (5.8)
Median	3.00	16.0
Min–max	1–5	11–25

SD, standard deviation.

other variables found no statistically meaningful difference ($t: 1.969; p = 0.058$).

Validity

Table 4 shows the relationship between anxiety scores for the Face Anxiety Scale and the POMS. The Pearson correlation test showed a strong positive correlation between the scales. A strong relationship was found between the Face Anxiety Scale and the tension-anxiety subscale of POMS ($r = 0.89; p < 0.001$). This finding demonstrates the reliability of the Face Anxiety Scale and similarly shows that a visual

Table 3 The relationship between test and re-test.

	r ^a	p
Test	0.88	0.001
Re-test		

^a Pearson correlation analysis.

Table 4 The relationship between the Face Anxiety Scale and the Profile of Mood States Scale.

	r ^a	p
Face Anxiety Scale	0.89	0.001
Profile of Mood States Scale		

^a Pearson correlation analysis.

Table 5 The correlation between the Face Anxiety Scale, designed according to the visual analogue scale (VAS) and the tension-anxiety subscale of the POMS.

	r ^a	p
Face Anxiety Scale	0.88	0.001
Profile of Mood States Scale		

^a Partial correlation analysis.

scale, which is also easier to use, may be substituted for the tension-anxiety subscale of POMS.

The correlation between the Face Anxiety Scale, designed according to the visual analogue scale (VAS) and the tension-anxiety subscale of the POMS was statistically high and meaningful ($r = 0.88; p < 0.001$) (Table 5). This finding implies the validity of the Face Anxiety Scale.

Discussion

Anxiety is a common problem for patients receiving mechanical ventilation, and ranges from medium to high levels. Despite awareness of this problem, patients have continued to suffer from anxiety, since it is difficult to evaluate anxiety for patients who cannot communicate (McKinley et al., 2002; Stein-Parbury and McKinley, 2000; Rotondi et al., 2002). Evaluation of anxiety levels for ICU patients is a necessary nursing action to help reduce anxiety and increase treatment potential (McKinley et al., 2003).

This study found that the mean score from the Face Anxiety Scale was 2.8 ± 1.3 . In the study by McKinley et al. (2003), the mean anxiety score of their participant group was 2.9 ± 1.2 . In the study by McKinley and Madronio (2008) for ICU patients who were not receiving mechanical ventilation, the authors found that the average anxiety score was 1.9 ± 0.99 . Chlan (2009) found that patient anxiety levels for patients receiving mechanical ventilation were higher, according to the Spielberger STAI. In another study, Chlan (2004) evaluated anxiety levels of patients receiving mechanical ventilation with two scales (Spielberger STAI and the visual analogue scale for anxiety (VAS-A)), and found that anxiety levels ranged from low to high. Our study found the same range, since patients were receiving mechanical

ventilation and were in the ICU. A score of three from the Face Anxiety Scale indicated medium-level anxiety, whereas a score of four and above showed higher anxiety (McKinley et al., 2004).

Our study did not evaluate the Cronbach alpha coefficient for internal consistency, since the face anxiety level consists of one item. Because of this, the reliability of the scale was measured by test–retest findings. Test–retest reliability is an important measure to show consistency of a scale over time (Kucukguclu et al., 2009). Our study found a meaningful, positive relationship between scores obtained from the first test and others that were conducted 15 minutes after the first one. The findings indicate that the Face Anxiety Scale findings were consistent over time and that the test–retest reliability was maintained.

The correlation between the Face Anxiety Scale and the POMS anxiety scale was 0.89. Chlan (2004) used the STAI and VAS scales to measure anxiety levels of patients receiving mechanical ventilation, and found that the correlation between the two scales was 0.50. On the other hand, McKinley and Madronio (2008) evaluated anxiety levels of patients in the ICU who were not receiving mechanical ventilation and found that the correlation between the Face Anxiety Scale and the STAI was 0.70. It has been reported that the scale serves its goal when the validity coefficient ranges between -1.00 and $+1.00$, and when the correlation has a higher value (Streiner and Norman, 2003). In this sense, the Face Anxiety Scale used in this research is valid.

McKinley et al. (2003) found that the Face Anxiety Scale was a reliable and valid instrument to measure anxiety levels of ICU patients who were receiving mechanical ventilation (McKinley et al., 2004; McKinley and Madronio, 2008). The study of Gustad et al. (2005) found that for patients transferred from the ICU to the clinic, the Face Anxiety Scale was a valid one, in that it is a one-item scale in which patients evaluate their own anxiety. It has been suggested that this scale has the potential to be used by clinicians to evaluate anxiety levels during patient treatment and care (McKinley and Madronio, 2008). Our study also found that the Face Anxiety Scale was able to assess anxiety levels of patients receiving mechanical ventilation at the CVS-ICU and that it is a helpful instrument. The scale should help to decrease anxiety by allowing patients to communicate their level of anxiety and thus help them to participate in their mechanical ventilation care (McKinley et al., 2004).

Conclusion

This study found that the Face Anxiety Scale was reliable for Turkish patients who were receiving mechanical ventilation at CVS-ICUs to evaluate their anxiety levels.

Limitations and recommendations

The scale consists of a single item, so Cronbach's Alpha coefficient was not calculated. Further studies may use the Face Anxiety Scale to determine anxiety in patients receiving mechanical ventilation, and reveal their post-extubation experience with qualitative data.

Funding

The authors have no sources of funding to declare.

Conflict of interest

None declared.

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