



Research Article

Evaluating YouTube Social Media Platform to Teach IV Skills in an Undergraduate Nursing Program in Attempt to Lower Student Anxiety

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Abstract

Background: High levels of anxiety are present among nursing students, especially when learning new skills. These high levels of anxiety can affect students' performance, and knowledge retained while learning and practicing skills. **Objectives:** The purpose of this study is to evaluate a new teaching method utilizing YouTube videos in attempt to lower nursing students' anxiety levels while learning new psychomotor skills, specifically IV skills. Anxiety will be measured using the State Trait Anxiety Inventory psychometric tool. **Methods:** A quantitative comparative evaluation study was conducted to compare an experimental group (n=8) that had access to a YouTube video series on IV skills prior to learning the skills and a control group (n=9) that did not have access to the videos. Anxiety levels were measured by the State Trait Anxiety Inventory (STAI) right before participants were tested for competency of IV skills. **Results:** There was not a statistically significance difference in anxiety levels among the groups, thus having access to YouTube videos did not lower nursing students' anxiety when learning IV skills. All participants reported varying levels of anxiety before being tested for their skill competency. **Conclusion:** Anxiety is present when nursing students learn new skills. Having access to YouTube Videos did not lower anxiety. Educators and researchers need to conduct further research in attempt to reduce this anxiety as it can have detrimental effects on students' performance.

Keywords: Anxiety; Nursing education; Psychomotor skills; Nursing students; Social media; YouTube

Trait Anxiety Inventory (STAI) which has been developed by Charles Spielberger and colleagues in 1964.

Introduction

A critical aspect in nursing education is learning and demonstration of basic nursing skills. These essential psychomotor competencies must be taught effectively for new nurses to be safe in providing patient care. Nursing students may be prone to high levels of anxiety, and anxiety has been shown to increase when students are learning a new skill [1]. This research project will examine a new way to teach skills using a streamlined YouTube video series in attempt to lower anxiety in students enrolled in a Baccalaureate nursing program during skill acquisitions of IV catheter insertion, priming an IV line, and IV pump programming. Anxiety levels will be scored and compared by utilizing The State

Background

Anxiety may be present in almost all individuals at different levels. Nursing students are especially prone to anxiety, and it has been reported that over 30% of nursing students have high levels of anxiety [2]. Students report challenges relating theory to practice and fear of failure as reasons that promote anxiety. It is crucial to identify these anxiety causing experiences among nursing students to better educate them for practice [3]. One such experience that research has proven increases nursing students' anxiety is skill acquisition. Taskin, et al. [1] reported in laboratory settings, such as a skills lab, anxiety levels of nursing students are increased when completing skills for the first time

that are invasive in nature such as injections or blood draws. Beyond attempting skills for the first time, nursing students also have increased anxiety while practicing or being evaluated on these skills by a faculty member [1]. Nurse educators have a responsibility to decrease anxiety of nursing students during skill acquisition and clinical practice [4].

Currently, the research on using YouTube videos in the nursing curriculum is sparse. There is evidence that demonstrates using videos is equal or better than traditional teaching methods [5]; therefore, there is a need to further research the use of YouTube videos in teaching nursing skills, as well as examine if it decreases students' anxiety.

Review of the Literature

There is strong support for utilization of videos to help assist in teaching basic nursing skills. Research is clear that the use of technology, such as video demonstrations has been successful in a variety of disciplines including nursing. This project is set to examine the use of the social media platform YouTube to demonstrate IV skills. In the literature, there are limited studies available utilizing YouTube in education and specifically in nursing education the research is absent at looking at anxiety and YouTube as a teaching method to help address this. Within nursing education many students report increased levels of anxiety, and currently it is unclear if the use of videos during instruction can help decrease this anxiety.

Anxiety among Nursing Students

The association between stress, anxiety and depression has been well documented in research studies [6-9]. Overall, academic education is a stressful process that leads to high levels of anxiety due to personal issues, social stress, and academic expectations, all of which are increased during college academia [7-9]. The nursing profession is one of the most stressful professions and in turn nursing students are required to face stressful endeavours in both their academic and professional lives.

This stress often results in higher levels of anxiety [9-13]. According to Mahfouz and Alsahli, (2016) [14] 48 out of 51 nursing students had high stress when examined using the perceived stress scale. The perceived stress scale classifies stress levels into low, moderate, and high stress levels, and zero nursing students scored in the low stress category [14]. Nursing students learn in the classroom as well as begin to acquire nursing skills in skill laboratories, hospital clinical settings, and simulation labs. All these environments present unique challenges for students and their anxiety levels. Nursing students are under extensive and constant evaluation, which leads to higher levels of anxiety in nursing students [6-9,15-17]. Rathnayake and Ekanayaka (2016) [9] tested students anxiety levels and found 16.3% reported extremely severe anxiety, 12% reported severe anxiety, and 21.7%

reported moderate anxiety. This equates to 50% of the nursing students reporting some level of anxiety [9].

Acquisition of psychomotor skills can be a major cause of anxiety [18-20]. The environment while performing the skill for the first time in public plays a major role in the increase in student anxiety [19,21]. Many different pedagogies and instructional methods have been evaluated in attempt to lower students' anxiety levels. Owens and Walden [19] reported peer instruction and feedback in the skill lab setting decreased students anxiety levels. Students also reported using peer feedback to assist with competency preparation and found it helpful in reducing their anxiety [19]. Akca, et al. [4] reports that touch (rubbing students' shoulders) prior to examination of IM injections lowered students' anxiety.

Video Studies for Skill Acquisition

Some of the reported positive attributes about utilizing online videos to assist with psychomotor skill acquisition include: students have an opportunity to work at their own pace, can learn in any environment outside the classroom they chose, increased levels of self-direction, and an excellent way for students to prep before class [22-25]. According to Kelly, et al. [23], the most reported benefit students noted was the ability to learn and re-watch the videos at their convenience [24,26]. This ability to learn at ones' own pace makes the material easier to understand according 90% of students given a survey after learning skill acquisition using videos. Bloomfield, et al. [27] reported students who were taught using a computer-assisted program had higher test scores eight weeks following the lesson than students who did not receive the computer-assisted lesson.

Methodology

Research Question

Do nursing students, who are enrolled in a Bachelor of Science Nursing Program and who are taught three psychomotor nursing skills via demonstration on the social media platform YouTube, demonstrate decreased anxiety compared to a group without access to the YouTube videos, as measured by the STAI psychometric tool?

Research Design

Second semester students enrolled in a Bachelor of Science of Nursing program (n=40) were asked to voluntarily participate in this descriptive study. Within the nursing cohort there are 40 students; ten students are placed into one of four clinical groups. Two of the sections will act as a control group in which traditional teacher demonstration of the skills will occur with no access to the YouTube videos. The other two sections of students will be the experimental group in which will be given access to the YouTube videos prior to teacher demonstration, as well as continued

access to the videos. On the day in which these skills were to be performed, in a final competency test, students were asked to fill out the psychometric tool STAI questionnaire to measure their anxiety levels prior to their competency exam.

Sample

The sample was selected out of convenience. The study location was BSN nursing program in the United States. The school of nursing consists of five semesters and second semester curriculum teaches the psychomotor skills in which this study sets out to further investigate in relation to students' anxiety levels. There are forty students in each semester.

Inclusion and Exclusion Criteria

To be included in the study a participant was required to be enrolled in the BSN program and in their second semester of study at the chosen study site. Exclusion criteria include students who had previous experience inserting IV catheters, knowledge of IV pumps, or hanging IV bags. Previous work experiences

or volunteering in such areas as EMT or Paramedics were also excluded from the study.

Setting

The primary setting of the study will take place on campus at the School of Nursing's skill lab. The skills lab is where the students will obtain hands on experience of practicing their IV skills. Traditional teaching demonstrations will also occur in this location. Students in the experimental group were given access to the YouTube videos one-week prior to being exposed to the material in class. These students could watch the YouTube videos whenever they chose. The chosen psychometric tool STAI will be administered in the skills lab when the students are expected to perform their competency test on these skills.

Measurement

The identified research variables included state anxiety, trait anxiety, and access to YouTube videos. See table (1) below.

Variable	Conceptual Definition	Operational Definition	Level of Measurement	Statistical Analysis
State Anxiety	State anxiety examines the feelings of anxiety and loss of control in that exact moment. It does not take into account past or future response, only the person current anxiety level they are responding as a result of the situation.	An increase heart rate, sweaty palms, shakiness, tremors, increased focus, sweaty, increased respirations	STAI	Descriptive statistics: mean sum, median, mode, variance and standard deviation Two-sample t-test
Trait Anxiety	Trait anxiety is the difference between people in their tendency to perceive events or situations as representing danger, threatening, or stressful (Mind Garden, n.d.). The stronger the trait anxiety the increased potential that they will experience more intense increases in state anxiety.	Manifest itself the same as state anxiety, although these people are prone to perceiving situations as anxiety provoking events	STAI	Descriptive statistics: mean sum, median, mode, variance and standard deviation Two-sample t-test
Access to YouTube Video Series	A social media website that allows users to upload, view, and comment videos of any type.			None

Note: From (Spielberger, 1983) [31]

Table 1: Identified research variables.

Measurement Tools

The measurement tool STAI was first developed by Charles Spielberger and colleagues in 1970 [28]. This psychometric tool has been used in over 3,000 research studies and translated into more than 30 languages [29,30]. The questionnaire is composed of 40 items to test for trait and state anxiety levels. Reliability of the STAI was completed by conducting a test-retest using high school in school setting. The test-retest correlation for trait anxiety ranged from 0.65-0.75 [31]. According to Cicchetti, values in 0.4-0.59 are fair, 0.60-0.74 are good, and values that are greater than 0.75 are deemed excellent. Thus, the values noted in this study of 0.65-0.75 are between good and excellent.

Data Analysis

Descriptive statistics was conducted with the data using two separate online platforms. The STAI questionnaire is based on a Likert Scale of participant's mind set of absence of anxiety or presence of anxiety on a scale of 1-4. The data was compiled for positive statements and negative statements (anxiety). A Persons Correlation test along with a sig. (2-tailed) t-test was used with a p-value of 0.001 to examine a linear relationship between the two variables of state and trait anxiety. This was done for both the experimental and control groups [32-34]. A gender comparison of anxiety levels was done within each group along with a comparison between the control and experimental group not accounting for gender. A Mann-Whitney test was also utilized to test for significance.

The sum of the score of the participants was analysed and compared between the two groups. Within this grouping other descriptive statistics such as mean sum, median, mode, variance, and standard deviation was conducted. The p-value will be 0.05.

Both sample groups are inter dependent of each other, thus a two-sample unpaired t-test was performed. A p-value of < 0.05 was used. Beyond the overall sample scores of the groups, a two-sample t-test was used in the statement that shows presence of anxiety. On the scale 20-80 where 20 represents no anxiety present and 80 equal's strong anxiety present.

Results

Analysis of the Control Group

Both the state anxiety and trait anxiety scales were totalled from the participant's answers to the individual questions on the form. Both the state anxiety scale and the trait anxiety scale have scores range from 20-80. A score of 20 indicates the lowest

possible degree of anxiety, and a value of 80 represents the highest level of anxiety. See Table (2) below for control group.

		State Anxiety	Trait Anxiety
N	Valid	9	9
	Missing	0	0
Mean		30.67	31.56
Median		28	30
Mode		21	25
Std. Deviation		10.977	8.048
Percentiles	25	21	25
	50	28	30
	75	41.5	38.5

Table 2: Descriptive statistics of the control group.

The mean average of state anxiety score was 30.67, mean score of the trait anxiety scale was 31.56. There is not a statistical difference between the state anxiety and trait anxiety mean scores. Mode value represents 21 and 25 for the state and trait score respectively. The median values divides the dataset into two halves. For State anxiety scale it is noted that 50% of respondents have values of the scale lower than 28 and 50% of them have a value higher than 28. The median value of trait anxiety scale is slightly higher.

For both scales, the mode and median values are lower than the mean values. From this it can be concluded that their distribution is positively skewed, i.e., that more respondents acquire rather lower values. The number of respondents with higher levels of anxiety values is lower. These values can be extreme and artificially increase the average. In such cases, it is more appropriate to use the median for comparison.

The positive skew can be further observed at the values of the quartiles. The lower quartile (percentile 0.25) is in both cases relatively close to the median (percentile 0.5). The lower quartile can be interpreted as a value that does not exceed 25% of respondents. Conversely, the upper quartile (percentile 0.75) is more distant from the median, this is due to the lower frequency of higher values. The value of the upper quartile can be interpreted as a value that exceeds only 25% of respondents. Correlations of the control group are presented in Table (3) below.

		State Anxiety	Trait Anxiety
State_Anxiety	Pearson Correlation	1	.908**
	Sig. (2-tailed)		0.001
	N	9	9
Trait_Anxiety	Pearson Correlation	.908**	1
	Sig. (2-tailed)	0.001	
	N	9	9

Note**: Correlation is significant at the 0.01 level (2-tailed).

Table 3: Correlations of the control group.

The existence of a linear dependence and its possible strength can be measured using Pearson’s correlation coefficient. It takes values from -1 to 1, where the value 0 corresponds to the nonexistence linear relationship of the variables, the higher the dependence of the variables, the higher the absolute value of the correlation coefficient. According to the sign, it is also possible to determine whether the dependence is positive or negative. A positive dependence means that as the value of one variable increases, the value of the other variable increases and vice versa.

The correlation coefficient of state anxiety and trait anxiety is 0.908. This value indicates a strong positive linear relationship between these variables. Based on the p-value of 0.001, it can be concluded that the value of the coefficient is significant and is therefore non-zero. The non-zero correlation coefficient means there is an existence of linear dependence. It can be expected that as the value of one of the anxiety scales increases, so does the value of the other. If state anxiety increases trait anxiety increases and vice versa. This dependent relationship is demonstrated on the graph below in Figure (1).

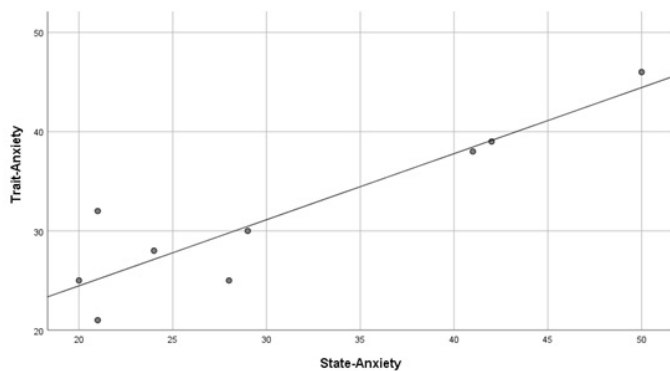


Figure 1: Scatterplot of trait anxiety by state anxiety.

Gender (control group)		State Anxiety	Trait Anxiety	
Male	N	Valid	3	3
		Missing	0	0
	Mean		20.67	26
	Median		21	25
	Mode		21	21 ^a
	Std. Deviation		0.577	5.568
	Percentiles	25	20	21
		50	21	25
		75	.	.
Female	N	Valid	6	6
		Missing	0	0
	Mean		35.67	34.33
	Median		35	34
	Mode		24 ^a	25 ^a
	Std. Deviation		10.132	7.967
	Percentiles	25	27	27.25
		50	35	34
		75	44	40.75

Note: Multiple modes exist. The smallest value is shown

Table 4: Gender Comparison of Control Group Statistics

The table of descriptive statistics of gender shown above in Table (4), demonstrates women achieve higher anxiety values than men. To determine whether this difference is significant, a Mann-Whitney test (a nonparametric version of a two-sample t-test) was performed see below Table (5).

H0: Men’s values = women’s values.

H1: Men’s values < women’s values.

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of State_Anxiety is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.024 ^a	Reject the null hypothesis.
2	The distribution of Trait_Anxiety is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.167 ^a	Retain the null hypothesis.

Note: asymptotic significances are displayed. The significance level is 0.50; a. Exact significance is displayed for this test

Table 5: Hypothesis test summary.

The p-values of this two-tailed test are given in the table above. Dividing this value by two gives a value that corresponds to the given one-sided test. The p-value of the test that the values of men’s State-Anxiety are lower than the values of women is 0.012. This value is lower than the level of significance of 0.05, thus H0 is rejected and H1 is accepted. Therefore, it can be assumed that the values of men are lower than the values of women for state anxiety.

Conversely, the p-value of the same test for Trait-anxiety is 0.084. The result of this test is not significant, and it cannot be assumed the gender values are significantly different in regard to trait anxiety.

Analysis of Experimental Group

		State Anxiety	Trait Anxiety
N	Valid	8	8
	Missing	0	0
Mean		39.38	38.5
Median		39	38
Mode		24 ^a	38
Std. Deviation		13.169	10.1
Percentiles	25	26.75	28.75
	50	39	38
	75	51.25	48.5
Note a: Multiple modes exist. The smallest value is shown			

Table 6: Statistics Experimental Group.

Statistics of the experimental group are shown in Table (6). When analysing the data of the experimental group, it is noted the mean and median values of both anxiety scales are very similar. In the case of trait anxiety, the value of the mode is equal to these values. Therefore, it can be assumed the skew of the data will not be as significant as in the control group. From the mentioned statistics and from the values of the percentiles, it is clear that the participants from the experimental group reported higher values on both the state anxiety and trait anxiety scales.

		State Anxiety	Trait Anxiety
State Anxiety	Pearson Correlation	1	.856**
	Sig. (2-tailed)		0.007
	N	8	8
Trait Anxiety	Pearson Correlation	.856**	1
	Sig. (2-tailed)	0.007	
	N	8	8

Note**. Correlation is significant at the 0.01 level (2-tailed).

Table 7: Correlations (experimental group).

The value of the correlation coefficient state anxiety and trait anxiety is 0.856 see Table (7). This coefficient can be considered significant. It can therefore be assumed that even in the case of the experimental group, there is a strong positive linear relationship between state anxiety and trait anxiety. The trend of this dependence is shown in the table below. Similar to the control group, it can be assumed as the values of one variable increase, so does the value of the other variable, further demonstrated in Figure (2).

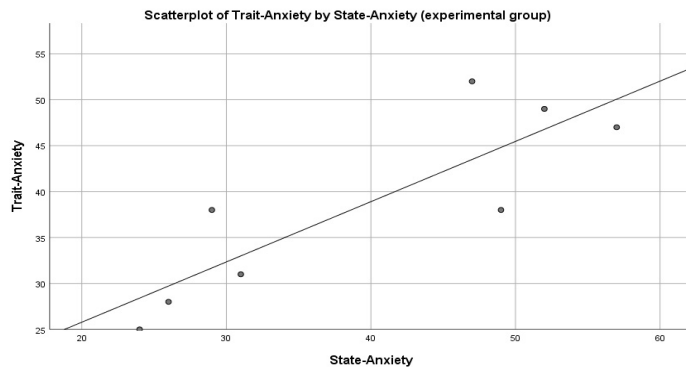


Figure 2: Scatterplot of trait anxiety by state anxiety (experimental group).

Gender		State Anxiety	Trait Anxiety
Male	N	Valid	1
		Missing	0
	Mean		24
	Median		24
	Mode		24
	Percentiles	25	24
		50	24
75		24	
Female	N	Valid	7
		Missing	0
	Mean		41.57
	Median		47
	Mode		26 ^a
	Percentiles	25	29
		50	47
		75	52
	Std. Deviation		12.541

Note a: Multiple modes exist. The smallest value is shown

Table 8: Statistics (experimental group).

In Table (8) of descriptive statistics, it can be observed that the values of men are significantly lower than the values of women. However, it should be noted that there is only one man in the experimental group, which could skew the results. With only one participant identified as being a male, it was not possible to prove a significant gender difference in state anxiety or trait anxiety. The p-values of both tests are higher than 0.05, so we do not reject the null hypothesis of the agreement of the distribution by gender. Verified by Table (9).

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of State_Anxiety is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.250 ^a	Retain the null hypothesis.
2	The distribution of Trait_Anxiety is the same across categories of Gender.	Independent-Samples Mann-Whitney U Test	.250 ^a	Retain the null hypothesis.
Note Asymptotic significances are displayed. The significance level is .050.				
a. Exact significance is displayed for this test.				

Table 9: Hypothesis Test Summary.

Analysis of the Control group Versus the Experimental Group

It was previously stated that both state anxiety and trait anxiety values are higher for experimental group. This difference was tested by the Mann-Whitney test.

H0: Values of anxiety are same for control and experimental group.

H1: Values of respondents from experimental group are higher.

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of State anxiety is the same across categories of group.	Independent-Samples Mann-Whitney U Test	.114 ^a	Retain the null hypothesis.
2	The distribution of Trait anxiety is the same across categories of group.	Independent-Samples Mann-Whitney U Test	.167 ^a	Retain the null hypothesis.
Note: Asymptotic significances are displayed. The significance level is .050.				
a. Exact significance is displayed for this test.				

Table 10: Hypothesis test summary.

Table (10) shows the p-value of the two-tailed test. Based on these results, the null hypothesis of agreement of the distribution cannot be rejected. Dividing the p-value by two gives the p-value of the test, which finds that the values of the respondents from the experimental group are higher. For state anxiety, this p-value is 0.057. For trait anxiety is 0.084. Again, we do not reject H0 and assume there is no significant difference between the groups. Therefore, it can be concluded that having access to the YouTube video series on IV skills prior to learning the skills had no significant difference in anxiety scores among those who did not have access to the videos. It can be concluded that YouTube videos do not decrease anxiety among students when learning IV skills.

Conclusion and Discussion

Discussion of Findings

This research examined a new way to teach IV skills utilizing YouTube videos in an attempt to identify if it would lower nursing student anxiety levels during psychomotor skill acquisition. The study findings indicated there was not significant

differences in anxiety levels among the group who had access to the YouTube videos prior to learning the skills and the group who did not have access to the YouTube videos until after learning the skills. YouTube videos did not help to lower student anxiety when learning new psychomotor skills.

State Trait Anxiety Inventory Results

Both the control and experimental groups demonstrated a positive dependence correlation of the variables of state and trait anxiety. A person who had higher trait anxiety, also reported higher state anxiety. When evaluating anxiety levels by gender it was determined that there was no significant difference between genders in the control group. The experimental group did find a significant difference resulting in males having lower anxiety scores. The experimental group only had one male, and thus further investigation needs to be conducted to conclude there is not a gender difference in anxiety levels. State anxiety was shown to be present when learning psychomotor skills for all participants. This is consistent with the findings of [1,2] which demonstrated the presences of nursing students' anxiety while learning new skills.

Although, anxiety was found in all participants, the availability to access YouTube videos prior to learning the IV skills did not assist in lower anxiety levels measured by the STAI. The experimental group showed slightly higher anxiety scores for both trait and state anxiety levels than the control group. This was found to not be significant when statistical analysis was done comparing the two groups.

Limitations

Although, the experimental and control groups were split nearly equally, the total participants of 17 was small. The sample was only conducted at one specific school of nursing and in a BSN program. Only one semester of students surveyed thus results cannot be associated with all nursing students. Participants in the sample groups were not evenly distributed by gender. Participants self-reported female 13/17. This left the sample of males in the study at only 4/17. Participants were taught skill via one of four instructors, in which could potentially teach and interact with students slightly differently. This could have affected anxiety levels of students either positively or negatively. Participants self-reported their anxiety, and self-reporting of anxiety has shown to be under reported. Each clinical group was on a different schedule and thus data was collected at different points in the semester.

Recommendations for Practice and Further Study

Although, this study did not reveal any significant difference in STAI anxiety scores, it is important to verify these findings with a larger sample size utilizing nursing students from multiple semesters, different School of Nursing University settings, and test with additional nursing skills beyond IV skills. Nursing student anxiety continues to be a major concern of educators and further research should be conducted with different approaches to find ways to lower anxiety among nursing students, especially when learning new skills.

Ethical Considerations

This study was approved and monitored by two separate Institutional Review Boards (IRB). Participants in the study were not subjected to any physical harm, discomfort, emotional or psychological stress as a result of the study.

Funding

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Ethics Approval and Consent to Participate

This study was approved by the Internal Review Board at Regis College with approval number 20202021-44.

Human and Animals Rights

No animals were used in this research. All human research procedures were followed in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

Consent for Publication

Written informed consent was obtained by all participants in the study.

Availability of Data and Materials

The data that supports these findings within the study are available from the corresponding author [R.B] on special request.

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