

Effects of Quran Recitation on The Reduction of Anxiety Before Elective Surgery: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Vahideh Zarea Gavgani

Tabriz University of Medical Sciences

Mortaza Ghojazadeh

Tabriz University of Medical Sciences

Tahmineh Khodapanah

Tabriz University of Medical Sciences

Fatemeh Sadeghi-Ghyassi (✉ ghyassi2722@yahoo.com)

Tabriz University of Medical Sciences <https://orcid.org/0000-0001-9446-9763>

Research article

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Abstract

Background: Anxiety is a common reaction among patients undergoing surgery. Religious believes are regarded as psychological methods that are used for the management of anxiety. The aim of this study is assessing the effectiveness of Quran recitation on reducing the anxiety before the elective surgery.

Methods: A systematic review of the citations in the Medline, EMBASE, Cochrane Library, PsycInfo, Arab World Research Source and other relevant databases was performed to collect the data. Randomized clinical trials about the effect of Quran recitation on the reduction of anxiety before elective surgery were included without any Language and date restriction. Interventions with self-reading/self-recitation were excluded. The Cochran's Q statistic and the (I^2) with 50 percent threshold was used for calculation of the heterogeneity and the inconsistency index. The funnel plot has been used to evaluate the possibility of the publication bias.

Results: We identified 2381 studies from the systematic search. Of these, twelve were included in the qualitative synthesis and nine studies included in the quantitative synthesis. Our meta-analysis showed a significant reduction in the anxiety level with Quran recitation. The heterogeneity of the included studies was statistically significant ($Q=23.05$, $I^2=65.29$, $P=0.003$). The pooled effect size of the anxiety was $d=-8.893$; 95% CI= $[-10.763$ to $-7.022]$ ($P < 0.001$), and there was no publication bias ($t=0.907$, $P=0.39$) in the studies.

Conclusion: Quran recitation can be considered as a non-invasive and peaceful intervention to reduce anxiety before elective surgery.

Introduction

There is increasing interest in non-pharmacological treatments, such as psychological therapy [1]. Music therapy is known as one of the most effective interventions for reducing stress and anxiety. In surgery, music and melodious sounds are used as safe, non-invasive, low-cost and easy to access therapeutic approaches [2, 3], which play an outstanding role in controlling the anxiety and stress of patients before and after the surgery [4, 5]. Quran recitation is pleasant to the listener due to its rhythmic sound and extraordinary arrangement of words [6]. Listening to Quran recitation, which has a great value among Muslims as a religious melodious sound, would be considered as an effective psychological therapy with a substantive effect on creating peace of mind and eliminating anxiety. Studies indicate that the reduction in heart rate occurring during Quran recitation leads to calmness [7]. In music therapy, an instrumental and slow-paced background music is typically used. However, listening to Quran recitation without any background music has been shown to decrease anxiety [8].

Anxiety is a common reaction among patients who are admitted to a hospital for surgery [9], that can be described as an unpleasant state of unease or tension caused by the patients' uncertainty about the results of the operation. Anxiety could also be a consequence of a higher analgesic requirement, a prolonged hospital stay, and postoperative pain [10, 11]. It is primarily a cognitive process and the more a person is able to control his or her mind, the better s/he can cope with the anxiety [12]. Various non-pharmacological methods, such as sports, nutrition, diet, relaxation techniques, bibliotherapy [13, 14] and calming music [15] are used for the reduction of sympathetic reactions [16]. Quran recitation itself and listening to Quran recitation are regarded as non-pharmacological approaches like the psychological methods and cognitive therapies that are used for the management of anxiety [17].

The positive effect of Quran recitation has already been reported in terms of the significant reduction of stress (anxiety) and pain in addition to palliative effects and also significant improvement on intra-uterine insemination, concentration, improved quality of dialysis and the vital signs of premature neonates [18–23]. A literature review has also revealed that there is a significant relationship between Quran Recitation and health and well-being [24]. According to this review, reciting the Quran has a positive effect on stress, anxiety and depression. A recent systematic review assessed the effect of listening to the Quran on anxiety [25]. In that study all articles which assessed the effect of Quran recitation in various fields in health care were systematically reviewed but no meta-analysis was performed.

The scope of this study was limited to elective surgery because the non-emergency nature of elective surgeries provides enough time to allow for Quran recitation for patients before the operation. Elective surgery is defined as "a surgery that is a planned, nonemergency surgery that can be scheduled at the convenience of the patient or the physician" [26]. The present study aims to systematically review and synthesize the original articles on the effectiveness of listening to Quran recitation for the management of anxiety in elective surgeries.

Methods

This systematic review was performed based on the statements of the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) [27].

Review Question

The PICO schema was used, comprising: Patients: All patients with elective surgeries; Intervention/Exposure: Quran recitation; Comparison: None; Outcome: Reduction of anxiety (based on State-Trait Anxiety Inventory (STAI) checklist).

The research question was: What is the effect of Quran recitation on the reduction of anxiety before elective surgeries?

Search strategy

A comprehensive search strategy was conducted in Medline (via Ovid), EMBASE, Cochrane Library, PsycInfo, Scopus, Web of Science, Arab World Research Source, Irandoc (Iranian Research Institute for Information Science and Technology), Magiran, Barakat knowledge network system and Islamic Science Citation (ISC) and Scencedirect. Dissertations and theses were searched via Proquest. For citation tracking, Scopus and Web of Science were also searched.

ClinicalTrials.gov and IRCT.ir were searched for gray literature. Google Scholar was searched for any further articles. We contacted authors of unpublished and ongoing studies, abstracts found in gray literatures and conference proceedings. The references of the selected studies were manually checked for additional articles which might be useful for the study. The search keywords were Quran, Koran, Kuran, recitation, voice, listening, anxiety, surgery and tune. A combination of controlled vocabulary, synonyms and different spellings were used in the search strategy. Since the publications in this field are mostly from Muslim countries, Arabic and Persian equivalents of search keywords were also searched. The first round of the search was completed in December 2018 and was updated in January 2020 for any new eligible studies.

Inclusion Criteria

All possible randomized control trials (RCTs) on the effect of Quran recitation on the reduction of anxiety in elective surgery were included in this study. No language restriction was applied. Only studies in which the anxiety level was examined using the State-Trait Anxiety Inventory (STAI) checklist were included in this study.

Exclusion Criteria

Studies without a control group, without a pre-/post-test design, studies of poor quality according to quality assessment, studies using anxiety inventory tools other than the STAI, studies involving Quran recitation along with translation, studies with different outcomes (such as depression) and studies involving the self-recitation of Quran by the patients themselves were excluded.

Study selection and quality assessment

All studies retrieved from databases were imported to EndNote X8 and duplicates eliminated. According to the inclusion and exclusion criteria, two authors (VZG & TKh) independently screened the studies for eligibility based on title and abstract. In the next stage, the remaining articles were examined by full text review. The quality of selected studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Randomized Controlled Trials (Table 1) [28]. Any disagreements were resolved through discussion. Two authors extracted data from studies using a data extraction form in Microsoft Excel 2013.

Statistical analysis

The difference between end points with standard deviation (SD) was used for meta-analysis. To assess the heterogeneity, the Cochran's Q test and the inconsistency index (I^2) were applied. The I^2 statistical threshold value was indicated 50 percent. If I^2 is less than 50 percent, the Mantel-Haenszel fixed effect size model should be used, and if I^2 is more than 50 percent or the p-value is less than 0.05, the random effect model should be used in order to calculate the effect size. The funnel plot and the Egger regression test were used to evaluate publication bias ($p < 0.05$ was considered as statistically significant publication bias). A Comprehensive Meta-Analysis (version 2) was employed for data analysis. A p-value of <0.05 was considered statistically significant.

Results

We identified 2381 articles from our systematic search for related literature. After removing duplicates, 986 articles were screened based on title and abstract. Finally, 30 articles were assessed for eligibility. Some related articles were available with two different versions [29-32]. We excluded the version containing the less comprehensive data [29, 32]. In addition we excluded studies with Quran recitation along with Persian translation [33]. Some studies were also excluded because of the study methodology, for example because it assessed the effect of Quran recitation only after intervention but not pre-test [34], or because it compared Quran recitation with aromatherapy [35]. It is essential to mention that there was a study with the same data which met our inclusion criteria and was included in the review [36]. Reasons for exclusion of the other studies from the review were: implementation of different assessment tools, different outcome measures, different publication types and not studying elective surgeries. After reviewing the full text of eligible studies, twelve RCTs were critically appraised. Finally, a total of twelve studies were included in the qualitative synthesis and nine studies were included for the quantitative synthesis [30, 31, 36-42]. The flow diagram of the study is shown in the Figure 1.

The range of patient ages was 25 to 63 years old. All studies investigated the effect of Quran recitation on the reduction of anxiety in the elective surgeries. In eight studies (66.7%), the experimental group received only Quran recitation, whereas in three studies (25%), there were two experimental groups receiving Quran and music [30, 38, 41] and one study receiving Quran recitation and its translation [31]. All the studies were conducted in Iran, as all studies from other Arabic-speaking countries were eliminated in the study selection process as none of them studied elective surgeries. The characteristics of the sample and the level of anxiety before and after intervention are shown in Table 2.

Quality of studies

Two authors (FSG & MG) independently appraised the quality of studies. The quality of the majority of studies (83.3%) was moderate to high, with less than 17% of studies having low quality (Table 3). Allocation blinding was unclear in most studies (75%). Blinding of participants was not possible due to the nature of study, as participants were aware of the intervention at the time, but in some studies, the researchers wore headphone when assessing patients in the intervention and control groups during the intervention period in order to reduce the risk of bias. In two of the studies, the outcome assessors were blinded to treatment assignment. In three studies, the outcome measure was described in a reliable way.

Qualitative synthesis

Instrument: In all of the studies the validated Persian version of the STAI was utilized as the outcome measure.

Quran recitation: In all of the studies except three [36, 42, 43], the Quran recitation was played for a duration of 20 minutes. The chapters (Surahs) Yusuf (Joseph) and Ar-Rahman (The Compassionate) were the most commonly used sections, and these were used in three studies. Most of the studies had two patient groups (intervention and control) but three studies included two interventions (one Quran recitation and the other music) with one control group. In these studies, 20 minutes of relaxing music was played to the second patient group.

Anxiety: In all of the studies, Quran recitation significantly reduced the level of anxiety in the intervention group. In the three studies that measured the effect of both music and Quran recitation as interventions, it was revealed that the impact of Quran recitation was larger than that of the music [30, 38, 41]. Four studies evaluated the levels of trait and state anxiety separately [36, 39, 42, 43]. These studies showed a significant decrease in both the trait anxiety and state anxiety in intervention group. One study reported just the total anxiety level [44].

Vital signs and pain: Four studies evaluated the impact of Quran recitation and music on patients' vital signs [30, 31, 42, 44]. The results of Mirbagher et al. and Sharafi show that Quran recitation had a significant effect on patients' breathing, blood pressure and pulse rate [30, 44]. The study of Tayebi et al. showed a significant reduction in breathing and blood pressure but no significant reduction in pulse rate [42]. The results of Shafiei's study were in contradiction with those of Tayebi et al. in that breathing and blood pressure exhibited no significant changes while pulse rate reduced significantly after intervention [31]. Conversely, Asgari's study showed a significant pain reduction in patients undergoing abdominal surgeries [37].

Quantitative synthesis

In this review 9 studies were included comprising a total of 652 patients with elective surgeries who were pooled in the meta-analysis. Three studies were excluded from meta-analysis because the SD was not reported for the mean anxiety score [43, 45] or only the total state and trait anxiety score was reported [44]. The intervention group was formed of 336 patients who listened to between 15 and 20 minutes of Quran recitation.

The mean anxiety score before and after intervention was used to calculate the pooled effect size. According to the results of the meta-analysis, Quran recitation had a positive effect on reducing anxiety in elective surgeries. Since the heterogeneity among included studies was statistically significant ($Q=23.05$, $I^2=65.29$, $P=0.003$), a random effects model was used to calculate the pooled effect size. The pooled difference in means calculated using a random effects model for anxiety showed a statistically significant decrease in anxiety for the Quran recitation group (difference in means: -8.893 ; 95% CI: -10.763 to -7.022 ; $P < 0.001$). Figure 2 shows the forest plot of the combined effect size.

According to the funnel plot and the Egger regression test (Figure 3), there was no publication bias (intercept= -1.64 , 95% CI: -5.94 to 2.64 , $t=0.907$, $df=7$, $P=0.39$).

Discussion

This meta-analysis was conducted to understand if listening to Quran recitation is effective in the management of anxiety before elective surgery. All possible RCTs on the effect of listening to Quran recitation before the elective surgeries on reducing the anxiety were included in the analysis. The results revealed that listening to Quran recitation before surgery leads to a significant reduction in anxiety, as measured using the STAI. This finding is consistent with the results of a previous meta-analyses finding a reduction of anxiety from listening to music [46, 47]. This also fulfills the Quranic verses as stated: The Quran is healing for those who perceive its meaning (Quran: 10:57; 17:82). The Quran is known as the ultimate source of guidance for Muslims, a book that contains the divine knowledge, and its instructions are sufficient for guidance of the men [48].

It should be emphasized that although both interventions (Quran and music) have a positive effect on anxiety reduction, the studies indicate that the effect of Quran recitation on anxiety reduction is higher than that of music [30, 38, 41]. But to reach the certainty in this regard, more studies need to be conducted.

The evidence reveals that Quran recitation has been used as a non-medical method for different purposes, especially for psychological issues in researches. An investigation on the effect of reading the Quran on controlling stress has shown that reading the Quran leads to a significant decrease in the stress level among 16–20 year olds [49]. In addition, Quran recitation itself or even listening to Quran recitation has a positive effect on the mental health by decreasing the risk of depression and anxiety-related disorders among caregivers [50], as well as hospitalized patients. Sadeghi et al. [24] found that learning life skills through a Quranic approach is more effective in the reduction of students' depression. This means that the intervention of the Quran in any form of reading, perception and listening may be effective in improving health and wellbeing. However, the outcomes of a study about the relationship between Quran recitation and post-operative abdominal pain showed no significant relationship [51].

As emphasized by Kaleem and Ahmed, there is a relationship between religious belief and anxiety [52]. Therefore, it may be that the presence of religious belief modulates the effect of listening to Quran recitation. From this, the clinical recommendation may need to take culture into account, and as such the use of Quran recitation before elective surgery can be recommended in Islamic countries to reduce patient anxiety.

In our review, although the included studies were from one Islamic country, their findings did not address the likely relationship between religious beliefs and the positive effect of Quran recitation on anxiety. Additional studies are needed to evaluate the interaction between the differing religious beliefs and the effect of Quran recitation on the anxiety.

The main limitation of the current study was the lack of access to some Arabic Databases to search local language studies. Nevertheless, the current study utilized Google Scholar and Arab World Research Source with regard to Arabic language studies, in addition to international databases. The small sample size may also be considered a limitation of this meta-analysis.

One of the strengths of this review was that a validated questionnaire was used to assess the effectiveness of the intervention of all studies. Homogeneity was observed in majority of the studies in terms of the duration of Quran recitation, representing another strength of this study.

Conclusion

Quran recitation has a significant effect on decreasing the anxiety among Muslim patients undergoing elective surgery. Quran sound and music as non-invasive and peaceful interventions can be supported and advocated by the findings of this study. However, due to the importance of evidence-based decision making in medical science, further studies in different populations especially in non-believers and non-Muslim communities are still needed to achieve certainty.

List Of Abbreviations

PRISMA: Preferred Reporting Items for Systematic Review and Meta-Analyses

STAI: State-Trait Anxiety Inventory

JB: Joanna Briggs Institute

Declarations

Ethics approval and consent to participate: Ethical approval was obtained from the Ethics Committee of the Tabriz University of Medical Sciences under Grant [TBZMED.REC.1394.975].

Consent for publication: Not applicable.

Conflict of interests: The authors declare no conflicts of interest.

Data Availability Statement: Data available on request from the authors

Competing interests: Not applicable.

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Authors' contributions: All authors contributed to the design of the study. VZ and TK were in charge of data collection. FSG, MG and VZ conducted the quality evaluation of the included studies. MG and FSG performed the data analysis. All authors drafted the manuscript and approved the final manuscript.

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Tables

Table 1
 JBI Critical Appraisal Checklist for Randomized Controlled Trials

No.	Question	Answers
Q1	Was true randomization used for assignment of participants to treatment groups?	Yes (Y)/No (N)/ Unclear (U)/NA
Q2	Was allocation to treatment groups concealed?	Yes (Y)/No (N)/ Unclear (U)/NA
Q3	Were treatment groups similar at the baseline?	Yes (Y)/No (N)/ Unclear (U)/NA
Q4	Were participants blind to treatment assignment?	Yes (Y)/No (N)/ Unclear (U)/NA
Q5	Were those delivering treatment blind to treatment assignment?	Yes (Y)/No (N)/ Unclear (U)/NA
Q6	Were outcomes assessors blind to treatment assignment?	Yes (Y)/No (N)/ Unclear (U)/NA
Q7	Were treatment groups treated identically other than the intervention of interest?	Yes (Y)/No (N)/ Unclear (U)/NA
Q8	Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	Yes (Y)/No (N)/ Unclear (U)/NA
Q9	Were participants analyzed in the groups to which they were randomized?	Yes (Y)/No (N)/ Unclear (U)/NA
Q10	Were outcomes measured in the same way for treatment groups?	Yes (Y)/No (N)/ Unclear (U)/NA
Q11	Were outcomes measured in a reliable way?	Yes (Y)/No (N)/ Unclear (U)/NA
Q12	Was appropriate statistical analysis used?	Yes (Y)/No (N)/ Unclear (U)/NA

No.	Question	Answers
Q13	Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?	Yes (Y)/No (N)/ Unclear (U)/NA

Table 2. State anxiety of included Studies

State Anxiety								Sample Size		Quran recitation Time period	Elective surgery type	Mean (Inte Cont)
Intervention				Control				Intervention	Control			
After	Before	After	Before	After	Before	After	Before					
Standard Deviation	Mean											
6.35	36.53	9.24	52.03	11.57	43.66	10.96	45.83	30	30	20 min	Abdominal surgeries	NA
6.53	41.2	5.8	50.1	5.63	50.43	5.87	49.8	30	30	18 min	Cardiac catheterization	53.6 56.9
6.8	41.14	7.9	43.83	8.7	42.78	8.6	42.69	32	32	15 min	Elective surgeries	32.4 40.3
3.14	34.24	3.75	42.1	2.61	43.3	2.61	43.3	20	20	20 min	Endoscopy	40± 39±
6.83	35.48	10.15	45.33	8.58	48.06	9.61	46.13	15	15	20 min	Cesarean section	28.9
8.3	35.37	8.6	38.73	8.6	37.93	8.1	35.23	60	60	20 min	Abdominal surgeries	29.6 30.5
6.2	35.21	7.06	42.1	5.32	43.13	6.19	41.38	45	45	20 min	Abdominal surgery	30± 30±
13.51	78.27**	23.76	108.1**	21.41	101.6**	22.71	102.83**	30	30	20 min	Shock wave lithotripsy	30-3
6.2	35.21	7.06	42.1	8.34	41.43	8.69	38.58	50	30	20 min	Cesarean section	25-3
10.46	37.31	7.09	48.11	10	50.48	9.56	48.12	54	54	20 min	Angiography	NA*
-	36.3	-	36.26	-	39.56	-	38.43	50	30	30 min	Open heart surgery	NA
-	37.47	-	44.95	-	44.75	-	47.72	40	40	20 min	Diagnostic & therapeutic operations	38.4

* Not Available

** State Anxiety + Trait Anxiety

Table 3
Results of critical appraisal of included studies

Studies	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Risk of Bias (%)
Asgari (2017)	Y	Y	Y	U	U	U	Y	Y	Y	Y	Y	Y	Y	Low (83%)
Babaii et al (2015)	Y	U	Y	U	N	U	Y	Y	Y	Y	U	Y	Y	Moderate (61%)
Tayebi et al (2014)	U	U	Y	Y	U	U	Y	Y	Y	U	Y	Y	Y	Moderate (61%)
Heydari, M. & Shahbazi, S. (2013)	U	U	U	U	U	U	Y	Y	Y	Y	U	Y	Y	High (46%)
Sharifi et al (2013)	U	U	Y	Y	U	U	Y	Y	Y	Y	U	Y	Y	Moderate (61%)
Shafiei (2011)	U	Y	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	Y	Low (84%)
Mirbagher Ajorpaz, N., et al (2011)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	Y	Y	Low (92%)
Sharafi (2000)	Y	U	Y	U	U	U	Y	Y	Y	Y	U	Y	Y	Moderate (61%)
Mirbagher AjourPaz, N. & Ranjbar, N. (2010)	U	U	Y	Y	U	U	Y	Y	Y	Y	U	Y	Y	Moderate (61%)
Majidi.S. (2004)	Y	U	Y	U	U	U	Y	Y	Y	Y	U	Y	Y	Moderate (61%)
Tajvidi et al (2001)	U	U	Y	U	U	U	Y	Y	Y	Y	U	N	Y	High (46%)
Nikbakht et al (1998)	U	U	Y	U	U	U	Y	Y	Y	Y	U	Y	Y	Moderate (53%)

* High: up to 50% of "yes" scores, Moderate: 51–80% of "yes" scores, Low: more than 81% of "yes" scores.

Figures

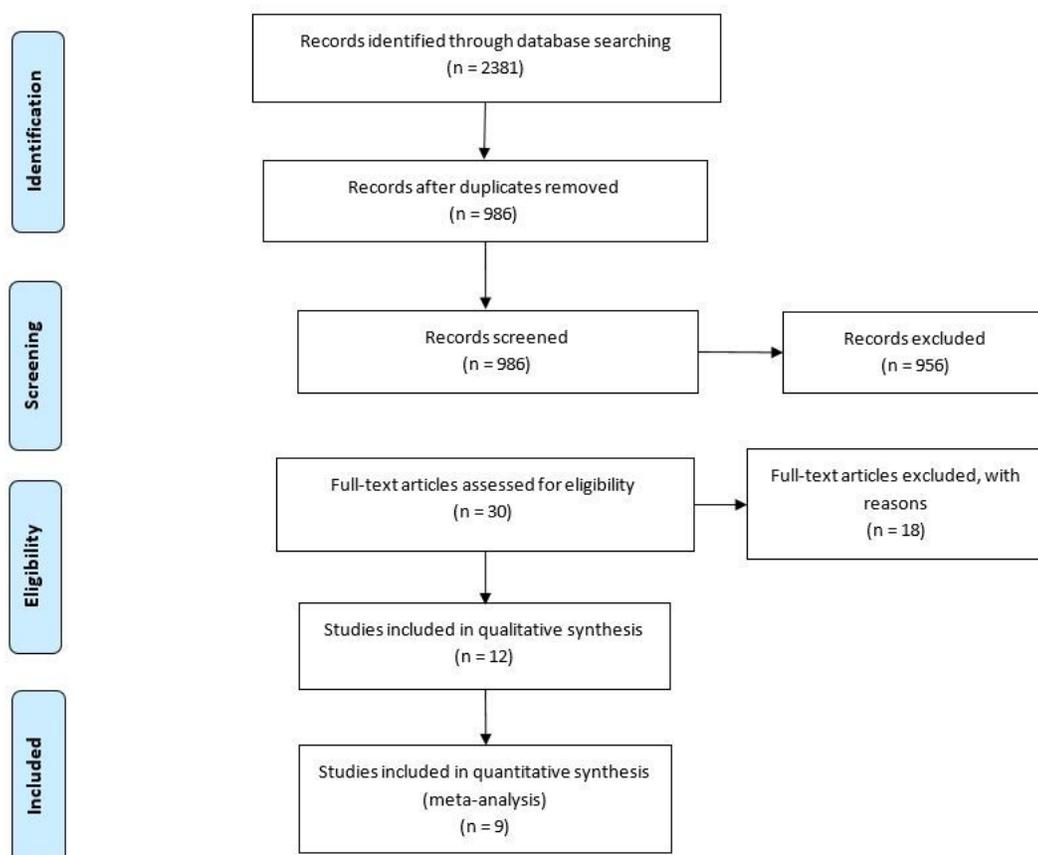


Figure 1

Flow diagram of the present study investigating the effects of Quran recitation on anxiety before surgery

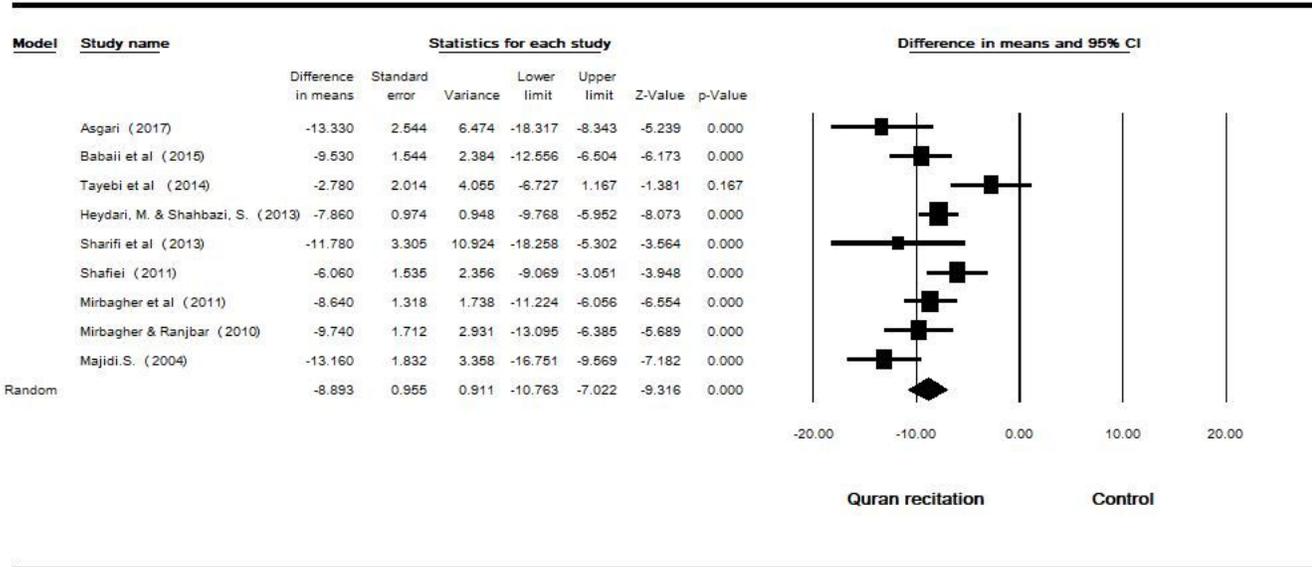


Figure 2

Forest plot of studies investigating the effect of Quran recitation on anxiety before surgery

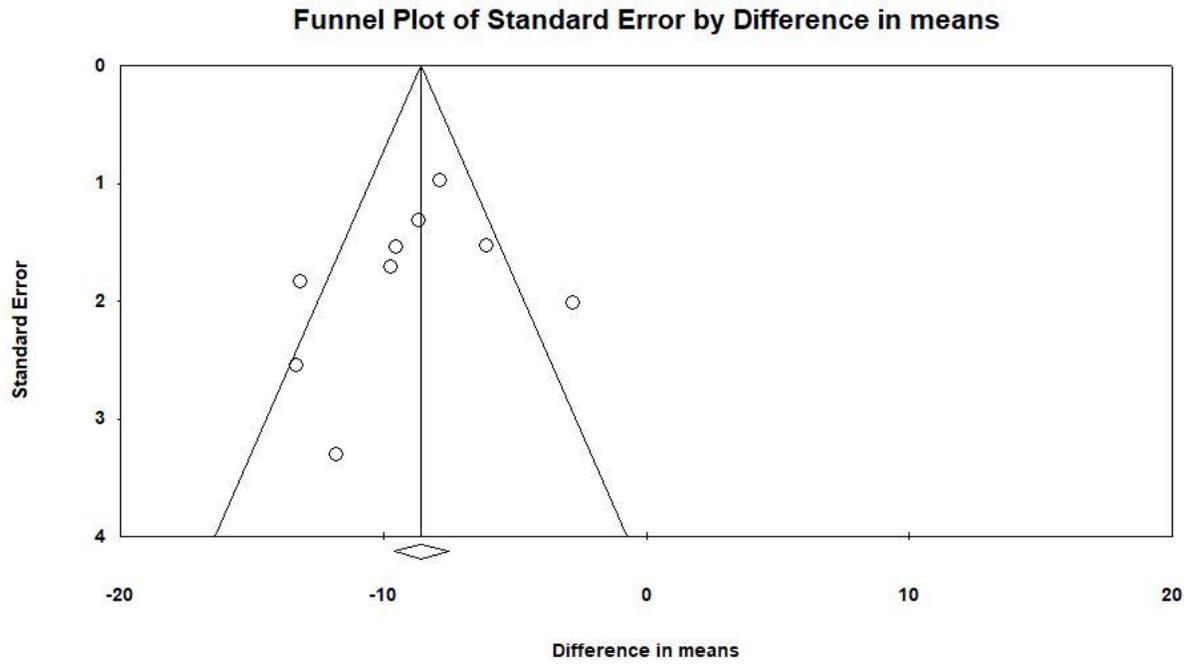


Figure 3

Funnel plot and Egger regression of studies showing the effects of Quran recitation on anxiety before surgery ($t=0.907$, $p=0.39$)