Prevalence and factors associated with preoperative anxiety among patients undergoing surgery in low-income and middle-income countries: a systematic review and meta-analysis

Asres Bedaso,1,2 Nibretie Mekonnen,1 Bereket Duko1,3

ABSTRACT

Objectives This review aimed to determine the pooled prevalence of preoperative anxiety and its associated factors among patients undergoing surgery in low/middle-income countries (LMICs).

Methods We searched PubMed, SCOPUS, CINAHL, Embase and PsycINFO to identify peer-reviewed studies on the prevalence and factors associated with preoperative anxiety among patients undergoing surgery using predefined eligibility criteria. Studies were pooled to estimate the prevalence of preoperative anxiety using a random-effect meta-analysis model. Heterogeneity was assessed using I² statistics. Funnel plot asymmetry and Egger’s regression tests were used to check for publication bias.

Result Our search identified 2110 studies, of which 27 studies from 12 countries with 5575 participants were included in the final meta-analysis. Of the total 27 studies, 11 used the State-Trait Anxiety Inventory to screen anxiety, followed by the Amsterdam Preoperative Anxiety and Information scale, used by four studies. The pooled prevalence of preoperative anxiety was found among female surgical patients (59.36%, 95% CI 48.16 to 62.93). Our subgroup analysis found that a higher pooled prevalence of preoperative anxiety was found among female surgical patients (59.36%, 95% CI 48.16 to 62.93), I²=95.43, p<0.001) and studies conducted in Asia (62.59%, 95% CI 48.65 to 76.53, I²=97.48, p<0.001).

Conclusion Our meta-analysis indicated that among one in two patients undergoing surgery in LMICs suffer from preoperative anxiety, which needs due attention. Routine screening of preoperative anxiety symptoms among patients scheduled for surgery is vital.

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INTRODUCTION

Anxiety is defined as a subjective state of emotional uneasiness, distress, apprehension or fearful concern associated with autonomic and somatic features and causes impaired functioning or activity.1 Anxiety can also be a normal emotional human reaction to circumstances of danger accompanied by physiological and psychological elements.1,2 Surgery is one of the standard medical procedures that could increase anxiety irrespective of the type of surgery.2,3 Surgery is a life-threatening procedure that causes the person to perceive himself under a direct physical restraint. Patients scheduled for surgery may experience fears and anxieties such as nervousness, fear of being unable to wake up from anaesthesia, fear of postoperative pain and fear of death.4 As a result, preoperative anxiety is becoming a significant mental health problem for many patients undergoing surgery.5,6

Different epidemiological studies revealed the varying magnitude of preoperative anxiety among patients undergoing surgery. For example, a global level systematic review and meta-analysis reported a 48% pooled prevalence of preoperative anxiety among patients undergoing surgery.7 A facility-based study conducted in Netherland found 27.9% and 20.3% of preoperative anxiety in patients undergoing hip and knee surgery, respectively.8 Epidemiological studies conducted in low/middle-income countries (LMICs) found that the prevalence of preoperative
anxiety ranges from 47% to 70.3% in India, 9,10 62% to 97% in Pakistan11–13 and 39.8% to 70% in Ethiopia.5,14–18

The magnitude of preoperative anxiety among patients undergoing surgery varies depending on the reasons and type of surgery, gender of the patient,12 patient interaction with medical staff, previous experience of surgical procedures and sensitivity to stressful circumstances.19,20 Also, factors such as fear of surgery, fear of anaesthesia, sociodemographic characteristics of the patient (age, educational status and partner status), types of surgery, fear of postoperative pain and fear of death were significant predictors of preoperative anxiety.16,17,21–25 However, the frequently mentioned major causes of preoperative anxiety were fear of the outcomes of surgery (29.5%), followed by fear of the progress after surgery (19.5%) and complications after surgery (11.4%).26 Furthermore, evidence also indicated that in many LMICs, the potential effect of scarce resources at health facilities, weak health systems and culture of a given community could play a paramount role in the increased rates of preoperative anxiety among surgical patients. For example, studies demonstrated that waiting for a longer duration for surgery,27,28 inadequate information about the procedure, disrespect by the clinician, lacking empathy29 and receiving less inpatient care30 could increase the risk of preoperative anxiety. Globally, the surgery rate ranges from 295 operations per 100,000 population in Ethiopia to 23,369 per 100,000 in Hungary, indicating a considerable difference in surgical service provision between low-income countries (LIC) and high-income countries (HIC) despite a growing unmet need.31 Despite the small number of surgical service in LMICs, it is compounded by the burden of managing postoperative complications such as delayed complications which mainly caused by inadequate inpatient care and low rates of follow-up service.31

Increased preoperative anxiety levels may be a reason for patients to decline planned surgical procedures.32,33 High levels of preoperative anxiety negatively affect the surgical operation and contribute to adverse surgical outcomes.34,35 Literature showed that preoperative anxiety might cause slow, complicated and painful postoperative recovery.35–37 Severe levels of anxiety before the surgical procedure have resulted in autonomic disturbances such as increased heart rate, raised blood pressure and arrhythmias,38 and affecting the outcomes of surgical procedures.39 Before the surgical procedure, patients who developed anxiety were found to require higher doses of anaesthetic medications, had a higher level of postoperative pain, increased consumption of analgesic drugs, increased morbidity, prolonged recovery and hospital stay.40–42 Appropriate management of anxiety by clinicians may provide a better preoperative assessment, less pharmacological premedication, smoother induction and maybe even better outcome.43

Based on the above evidence there was a substantial difference in the reported prevalence of preoperative anxiety among patients undergoing surgery across studies. Also, there is no previously conducted systematic reviews and meta-analysis on the topic of interest, particularly in LMICs. Furthermore, identifying the significant correlates of preoperative anxiety is vital to reduce the burden or prevent the onset and subsequent consequences. Therefore, this review aimed to examine the prevalence and thematically quantify and present factors associated with preoperative anxiety among patients undergoing surgery in LMICs and formulate recommendations for future healthcare services in the area.

**METHODS**

**Search strategy**

A systematic review and meta-analysis was conducted using studies that examined the prevalence and factors associated with preoperative anxiety among patients undergoing surgery in LMICs. The strategy for literature search, selection of studies, data extraction and reporting of results for the current review was designed following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines19 (online supplemental file 1).

Five electronic databases (PubMed, SCOPUS, CINAHL, Embase and PsychINFO) were systematically searched to identify studies that report the prevalence of preoperative anxiety among patients undergoing surgery in LMICs. Searching in PubMed was performed using the following terms: ((Prevalence OR Magnitude OR Epidemiology OR Incidence OR Estimates OR Burden OR Associated factors OR Determinants OR Correlates OR Predictors) AND ((Preoperative Anxiety OR Anxiety OR Anxiety symptoms OR Anxiety disorder OR General Anxiety disorder) AND (Surgical patients OR patients undergoing surgery OR surgery)).

Database-specific subject headings associated with the above terms were used to screen studies indexed in SCOPUS, CINAHL, Embase and PsychINFO databases. Besides, we observed the reference lists of published studies to identify potential other relevant articles for this review. The whole search strategy of our review is presented in online supplemental file 2.

**Eligibility criteria**

In the current review, we have included observational studies conducted on determining the prevalence and factors associated with preoperative anxiety among patients undergoing surgery in LMICs, and written in English language. Eligible studies included for this review had to fulfill the following criteria: first, the type of study has to be observational (cross-sectional, nested case–control, cohort studies or follow-up studies). Second, the study participants were patients (age ≥18 years) who have a schedule to undergo surgical procedures under anaesthesia, regardless of their sex. Third, measurement of anxiety was done using standard diagnostic criteria or a validated screening tools. Fourth, the studies should be from a LMIC. World Bank Atlas classified countries as low-income and middle-income for those with the Gross National Income per capita
of ≤$1025 and between $1025 and $12375, respectively (https://data.worldbank.org/indicator/NY.GNP.PCAP.CD).

Studies that reported pooled preoperative anxiety, had a poor quality score on the Newcastle Ottawa Scale (NOS), duplicate studies, conference proceedings, commentaries, reports, short communications and letters to editors were excluded. Then full-text articles were independently checked for their eligibility by two investigators (AB and NM). Disagreements were resolved by discussing with a third author (BD) for the final selection of studies.

**Data extraction and study quality assessment**

Data were extracted using a specific form designed to extract data that authors developed. The data extraction form included the following information: name of the author, year of publication, country, study design, sample size, type of surgery and the number of positive cases for preoperative anxiety, prevalence of preoperative anxiety and significant factors associated with preoperative anxiety. AB conducted the primary data extraction, and then NM assessed the extracted data independently. Any disagreements and discrepancies were resolved through discussion with the third author BD.

The methodological qualities of each included article were assessed by using a modified version of the NOS. The methodological quality and eligibility of the identified articles were independently evaluated by two reviewers (AB and NM), and disagreements among reviewers were resolved through discussion with the third Author (BD). The summary of the agreed level of bias and level of agreement between independent evaluators of studies is mentioned in online supplemental file 3. Finally, studies with a scale of ≥5 out of 10 were included in the current review.

**Data analysis**

For the first objective, estimating the pooled prevalence of preoperative anxiety, the prevalence report extracted from all the included primary studies were meta-analysed. For the second objective, identifying the significant factors associated with preoperative anxiety, reports of measures of associations (OR, r, β or RR) were presented using narrative synthesis. The narrative synthesis was conducted per the approaches indicated on the Conduct of Narrative Synthesis in Systematic Reviews.46 While interpreting the association between significant factors and preoperative anxiety, adjusted estimates were the first choice. However, for studies that missed reporting adjusted estimates, crude estimates were considered.

We have examined publication bias by visual inspection of a funnel and conducting Egger’s regression tests.47 48 A p value <0.05 was used to declare the statistical significance
of publication bias. Studies were pooled to estimate pooled prevalence and 95% CI using a random-effect model.\(^6\) We have assessed heterogeneity using Cochran’s Q and the I\(^2\) statistics.\(^50\) I\(^2\) statistics is used to quantify the percentage of the total variation in the study estimate due to heterogeneity. I\(^2\) values of 25, 50% and 75% were considered to represent low, medium and high heterogeneity, respectively.\(^51\) Due to significant heterogeneity across studies, we conducted a subgroup analysis using moderators such as methodological quality of studies, country, gender, anxiety assessment tool, economic level of a country and region where a country located. Also, sensitivity analysis was conducted to evaluate the presence of outlier estimates of preoperative anxiety. All the extracted data were analysed using STATA V.16.

**Patient and public involvement**
No patient or public involved in the current review.

### RESULTS

**Identification of studies**
We have identified a total of 3110 studies from five databases in our initial electronic searching. After removing duplicates, reviewing titles and abstracts, 211 studies were considered eligible for full-text review. All the extracted data were analysed using STATA V.16.

**Patient and public involvement**
No patient or public involved in the current review.

### Table 1  Characteristics of studies included in the current systematic review

| Author                  | Publication year | Country      | Sample size | Study design  | Type of surgery | Cases | Prevalence (%) | Anxiety measures (cut-off point) |
|-------------------------|------------------|--------------|-------------|---------------|-----------------|-------|----------------|----------------------------------|
| Bedaso and Ayalew\(^4\) | 2019             | Ethiopia     | 407         | Cross-sectional | All surgery   | 191   | 47             | STAI (≥44/80)                    |
| Takele et al\(^15\)    | 2019             | Ethiopia     | 237         | Cross-sectional | All surgery   | 132   | 56             | PITI-20 Item (≥16/60)            |
| Woldegerima et al\(^16\)| 2018             | Ethiopia     | 178         | Cross-sectional | All surgery   | 106   | 60             | STAI (≥44/80)                    |
| Mulugeta et al\(^17\)  | 2018             | Ethiopia     | 353         | Cross-sectional | All surgery   | 215   | 61             | STAI (≥44/80)                    |
| Akinsulore et al\(^18\)| 2015             | Nigeria      | 51          | Cross-sectional | All surgery   | 26    | 51             | STAI (≥44/80)                    |
| Nigussie et al\(^1\)   | 2014             | Ethiopia     | 239         | Cross-sectional | All surgery   | 168   | 70.3           | STAI (≥44/80)                    |
| Ebirim and Tobin\(^60\)| 2010             | Nigeria      | 125         | Cross-sectional | All surgery   | 43    | 34             | VAS (≥45/100)                    |
| Srahbu et al\(^19\)    | 2018             | Ethiopia     | 423         | Cross-sectional | Orthopaedic surgery | 168   | 39.8           | HADS-A (≥18)                     |
| Ryamukuru\(^2\)        | 2017             | Rwanda       | 151         | Cross-sectional | All surgery   | 110   | 72.8           | PITI-20 Item (≥15/60)            |
| Zammit et al\(^23\)    | 2018             | Tunisia      | 332         | Cross-sectional | All surgery   | 224   | 67.5           | APAI score (≥10)                 |
| Dagona\(^4\)           | 2018             | Nigeria      | 30          | Cross-sectional | All surgery   | 16    | 53.3           | APAI-H (NA)                      |
| Matthias and Samarasekera\(^44\)| 2011     | Srilanka     | 100         | Cross-sectional | Elective surgery | 77    | 77             | APAI score (≥11)                 |
| Carneiro et al\(^5\)   | 2009             | Brazil       | 96          | Cross-sectional | Cardiac surgery | 42    | 43.8           | HADS-A (≥9)                      |
| Ramesh et al\(^63\)    | 2017             | India        | 140         | Cross-sectional | Cardiac surgery | 118   | 84             | STAI (≥40/80)                    |
| Gonçalves et al\(^66\) | 2016             | Brazil       | 106         | Cross-sectional | Cardiac surgery | 43    | 40.6           | BAI (NA)                         |
| Alves et al\(^67\)     | 2007             | Brazil       | 114         | Cross-sectional | Cosmetic surgery | 85    | 74.5           | STAI (≥36/80)                    |
| Caumo et al\(^8\)      | 2001             | Brazil       | 591         | Cross-sectional | Elective surgery | 141   | 23.99          | STAI (≥39/80)                    |
| Jafar and Khan\(^11\)  | 2009             | Pakistan     | 300         | Cross-sectional | Elective surgery | 186   | 62             | STAI (NA)                        |
| Maheshwari and Ismail\(^12\) | 2015       | Pakistan     | 154         | Cross-sectional | Elective CS  | 112   | 72.7           | VAS (≥50)                        |
| Ali et al\(^69\)       | 2013             | Turkey       | 80          | Cross-sectional | Gall bladder surgery | 31    | 38.75          | BAI (≥17/63)                     |
| Ya’akba and Vachkova\(^71\)| 2017          | Palestine    | 320         | Cross-sectional | All surgery   | 184   | 57.5           | APAI score (≥11)                 |
| Tajgna and Krishna\(^62\)| 2018          | India        | 160         | Cross-sectional | All surgery   | 140   | 87.5           | DASS-21 (NA)                     |
| Xu et al\(^72\)        | 2016             | China        | 53          | Cross-sectional | Gastric cancer surgery | 11    | 20.75          | HADS-A (≥18)                     |
| Santos et al\(^73\)    | 2014             | Brazil       | 41          | Cross-sectional | Rectal surgery | 16    | 39             | BAI (≥10/63)                     |
| Khalili et al\(^65\)   | 2019             | Iran         | 231         | Cross-sectional | All surgery   | 109   | 47.2           | STAI (≥40/80)                    |
| Kanwal et al\(^61\)    | 2018             | Pakistan     | 363         | Cross-sectional | All surgery   | 228   | 62.8           | VAS (≥45/100)                    |
| Tajgna et al\(^62\)    | 2017             | India        | 200         | Cross-sectional | Emergency CS  | 110   | 55             | STAI (≥40/80)                    |

APAI, Amsterdam Preoperative Anxiety and Information Scale; BAI, Beck Anxiety Inventory; CS, caesarean section; DASS-21, Depression Anxiety and Stress Scale; HADS, Hospital Anxiety and Depression Scale; PITI, Preoperative Intrusive Thought Inventory; STAI, State-Trait Anxiety Inventory; VAS, Visual Analogue Scale.
185 articles in full-text review and adding 1 article that we get through reference searching, 27 studies were included in this systematic review and meta-analysis (figure 1).

**Characteristics of included studies**

Of the total 27 studies (5575 population), all (100%) studies employed cross-sectional study design, and 9 (81.2%) studies published in the past 5 years. Also, six studies were conducted in Ethiopia, five studies were from Brazil, and three studies were from each of the following countries: Nigeria, Pakistan, and India. The sample size of the included studies ranges from 30 in Nigeria to 591 in Brazil. The prevalence of preoperative anxiety ranges from 34% in Nigeria to 87.5% in India. Of the 27 included studies, 16 (59.2%) were from middle-income countries, whereas 11 (40.8%) were from LICs. State-Trait Anxiety Inventory (STAI) is the most common tool used to screen anxiety (11 studies), followed by the Amsterdam Preoperative Anxiety and Information Scale (APAI) (4 studies) (table 1).

**Methodological quality of studies**

We used the modified NOS to evaluate the methodological quality of the studies included in the current review. Among the 27 studies included in the present review, 16 studies were of high (NOS score ≥ 8) and 11 studies were of moderate methodological quality (NOS score 6–7) (online supplemental file 4).

**Meta-analysis**

The pooled prevalence of preoperative anxiety among patients undergoing surgery within the LMICs included within this study was estimated to be 55.7% (95% CI 48.60 to 62.93) with considerable heterogeneity between studies (I²=97%; p<0.001). Consequently, a random-effects meta-analysis model was employed to estimate the overall pooled prevalence (figure 2).

Further, to explore the possible sources of heterogeneity we employed a random-effect univariate meta-regression model considering the sample size, publication year and NOS quality score as moderators. However, none these continuous variables (ie, sample size (coefficient=−0.015, p=0.533), publication year (coefficient=0.984, p=0.202)

![Figure 2](https://example.com/figure2.png)  
*Figure 2* Forest plot showing the pooled prevalence of preoperative anxiety among patients undergoing surgery in low-income and middle-income countries. ES, effect size.
and NOS quality score (coefficient=-2.65, p=0.412) found to have significant association with heterogeneity.

Publication bias
Inspection of the funnel plot looks symmetric and shows no significant publication bias (figure 3). Besides, eggers regression test suggested absence of publication bias (B=-2.79, SE=2.013, p=0.165).

Sub-group and sensitivity analysis
Due to the reported high heterogeneity index among studies, a subgroup analysis was conducted using characteristics like country, type of anxiety tool used, quality of studies and economic level of a country. Among studies that assessed the prevalence of preoperative anxiety among surgical patients, the subgroup analysis based on the region where the studies conducted revealed that a higher pooled prevalence of preoperative anxiety was reported in a study conducted in Asia (62.59%, 95% CI 48.65 to 76.53, I²=97.48, p<0.001) compared with those studies with high methodological quality (54.8%) (95% CI 44.28 to 65.28, I²=97.8, p<0.001). Furthermore, a pooled estimate of preoperative anxiety among female surgical patients (59.36%, 95% CI 48.16 to 70.52, I²=95.43, p<0.001) was higher than their male counterparts (45.95%, 95% CI 31.69 to 60.21, I²=96.67, p<0.001). However, a pooled estimate of preoperative anxiety in middle-income countries (55.7%) (95% CI 48.60 to 62.93, I²=98, p<0.001) was comparable to studies conducted in LICs (54.9%, 95% CI 47.69 to 62.17, I²=92.6, p<0.001) (table 2).

Moreover, we have conducted a leave-one-out sensitivity analysis to identify the influence of one study on the overall pooled estimate. The overall estimate of this study did not appear to be affected by the removal or addition of a single study at a time, suggesting the robustness of our pooled estimate. Thus, the pooled prevalence of preoperative anxiety ranges from 54.5% to 57.2% (figure 4).

Factors associated with preoperative anxiety among patients undergoing surgery
The results extracted from studies conducted on factors associated with preoperative anxiety among patients undergoing surgery are presented in online supplemental file 5. Associated factors that have been adjusted in the studies included in this review were inconsistent across studies conducted in LMICs.
Of the total studies included in the review, 10 studies reported the increased odds of preoperative anxiety symptoms among female patients when compared with male patients. Similarly, being young age has significantly increased the odds of preoperative anxiety symptoms in patients waiting for scheduled surgery. Preoperative anxiety was significantly associated with fear of death, dependency, and disability. Further, patients who did not receive adequate preoperative information were more likely to have clinically significant preoperative anxiety levels compared with patients who did receive high-level information. Not surprisingly, low income appeared to increase the odds of developing preoperative anxiety symptoms in patients waiting for surgery. Likewise, having a family history of mental illness, history of cancer and smoking, lower
educational attainment were found to be associated with preoperative anxiety symptoms in patients waiting for surgery.

Moreover, statistical adjustment for some other risk factors varied for respective studies included in this review. Factors such as getting low social support, fear of unexpected outcome of surgery, being non-partnered, urban residence, inadequate awareness of anaesthesia adverse effect, number of days of hospitalisation, having a chronic medical illness, gastrointestinal problems were found to have a significant positive correlation with preoperative anxiety after adjusting for other factors.

**DISCUSSION**

This systematic review and meta-analysis synthesised the results of 27 primary studies that were conducted in LMICs to determine the pooled prevalence and factors associated with preoperative anxiety among 5575 surgical patients undergoing surgery.

The pooled prevalence of preoperative anxiety among patients undergoing surgery in LMICs was 55.7%. The pooled estimate in the current review was higher when compared with the pooled prevalence reported in a global level systematic review and meta-analysis that included 14652 study participants (48%). Likewise, the pooled estimate of our review was higher than the estimates from different epidemiological studies conducted in HICs such as the Netherlands reported that 27.9% and 20.3% of patients undergoing hip and knee surgery, respectively, experienced anxiety symptoms before the actual surgery. The variation in the demographic characteristics of participants and may partly explain the observed difference in the pooled estimates. Furthermore, risk factors such as genetic make-up of individuals, access to information regarding their surgical procedure, quality and availability of service in each health facility, sampling methods, and tools used to screen anxiety may contribute to the observed difference.

Surprisingly, the available epidemiological evidence was virtually unchanged when the origin of the primary studies included in this review considered as a moderator. For example, the pooled prevalence of preoperative anxiety was 77% in Sri Lanka, 75.6% in India and 72.8% in Rwanda. Although evidence suggests that an individual cultural background could potentially affect the experience of anxiety symptoms, the variability of the origin of primary studies appeared to play a negligible role in the pooled estimate of this study.

The subgroup analysis using the tools used to estimate the prevalence of preoperative anxiety showed a slight variation in the prevalence of preoperative anxiety among patients undergoing surgery. Most notably, the prevalence of preoperative anxiety among patients undergoing surgery was slightly higher in the studies that have used DASS to ascertain preoperative anxiety in patients when compared with APAI. The discrepancy may be due to variability in the psychometric properties of those measures.

Our review found that the prevalence of preoperative anxiety was higher among female surgical patients compared with their male counterparts. Also, of the studies included in the current systematic review and meta-analysis, 10 studies reported that being female increased the odds of developing preoperative anxiety among surgical patients. This might be because of women’s experience of some specific forms...
of mental health problems like premenstrual dysorphic disorder, postpartum depression and postmenopausal mental illness, which are linked with changes in ovarian hormones that may contribute to the observed difference in risk of developing preoperative anxiety among female patients.70

Early screening and targeted intervention of preoperative anxiety among patients undergoing surgery are recommended for future action. Further studies should be conducted to examine the possible reasons for a substantially higher burden of preoperative anxiety among patients undergoing surgery. Moreover, interventional and randomised controlled trials (RCTs) are recommended and randomised for a specific group of surgical patients.

It is worth noting the following potential limitations of our review in generalising the findings. First, there is significant heterogeneity among studies included in the current review. Second, the restriction to include studies published only in English language could introduce possible selection bias and limit the generalisability to all LMICs.

CONCLUSION

Our study indicated that around one in two patients undergoing surgery in LMICs suffer from preoperative anxiety, which needs due attention. Therefore, routine screening of preoperative anxiety among patients scheduled for surgery is vital. In addition, providing preoperative education on the effect of anaesthesia, surgical procedure and possible postoperative pain management options is highly warranted. Due to the significant heterogeneity across the studies, future studies should examine preoperative anxiety for a specific group of surgical patients by stratifying the possible associated factors. Moreover, since all the included studies employed a cross-sectional study design, the findings did not show a temporal relationship between preoperative anxiety and its associated factors. Therefore, future longitudinal studies and RCTs are recommended.

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ORCID iDs

Asres Bedaso http://orcid.org/0000-0001-7859-0264
Bereket Duko http://orcid.org/0000-0002-4419-0016

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Supplementary file 1. PRISMA (Preferred Reporting Items for Systematic review and Meta Analysis Protocols) 2020 checklist: Recommended items addressed in our systematic review and meta-analysis.

| Section/topic      | # | Checklist item                                                                 | Reported on page # |
|--------------------|---|--------------------------------------------------------------------------------|-------------------|
| TITLE              |   |                                                                                |                   |
| Title              | 1 | Identify the report as a systematic review, meta-analysis, or both.            | 1                 |
| ABSTRACT           |   |                                                                                |                   |
| Structured summary | 2 | Provide a structured summary including, as applicable: background; objectives;  | 2                 |
|                    |   | data sources; study eligibility criteria, participants, and interventions;     |                   |
|                    |   | study appraisal and synthesis methods; results; limitations; conclusions and   |                   |
|                    |   | implications of key findings; systematic review registration number.           |                   |
| INTRODUCTION       |   |                                                                                |                   |
| Rationale          | 3 | Describe the rationale for the review in the context of what is already known.  | 3&4               |
| Objectives         | 4 | Provide an explicit statement of questions being addressed with reference to   | 3&4               |
|                    |   | participants, interventions, comparisons, outcomes, and study design (PICOS).  |                   |
| METHODS            |   |                                                                                |                   |
| Protocol and       | 5 | Indicate if a review protocol exists, if and where it can be accessed (e.g.,   | CRD42020161934    |
| registration       |   | Web address), and, if available, provide registration information including    |                   |
| Eligibility criteria| 6 | Specify study characteristics (e.g., PICOS, length of follow-up) and report    | Page 4, Parag. 2  |
|                    |   | characteristics (e.g., years considered, language, publication status) used    |                   |
|                    |   | as criteria for eligibility, giving rationale.                               |                   |
| Information sources| 7 | Describe all information sources (e.g., databases with dates of coverage,     | 4 Parag. 1        |
|                    |   | contact with study authors to identify additional studies) in the search and   |                   |
|                    |   | date last searched.                                                          |                   |
| Search             | 8 | Present full electronic search strategy for at least one database, including   | 4                 |
|                    |   | any limits used, such that it could be repeated.                            |                   |
| Study selection    | 9 | State the process for selecting studies (i.e., screening, eligibility,         | Page 4 & 2       |
|                    |   | included in systematic review, and, if applicable, included in the meta-      |                   |
|                    |   | analysis).                                                                   |                   |
| Data collection    | 10| Describe method of data extraction from reports (e.g., piloted forms,        | Page 5            |
| process            |   | independently, in duplicate) and any processes for obtaining and confirming   |                   |
| Data items         | 11| List and define all variables for which data were sought (e.g., PICOS,       | 5 & 12            |
|                    |   | funding sources) and any assumptions and simplifications made.                |                   |
| Risk of bias in    | 12| Describe methods used for assessing risk of bias of individual studies        | 5                 |
| individual studies |   | (including specification of whether this was done at the study or outcome     |                   |
|                    |   | level), and how this information is to be used in any data synthesis.         |                   |
| Summary measures   | 13| State the principal summary measures (e.g., risk ratio, difference in means). | 10, Para 1        |
| Synthesis of results| 14| Describe the methods of handling data and combining results of studies, if    |                   |
|                    |   | done, including measures of consistency (e.g., I²) for each meta-analysis.     |                   |
| Section/topic                  | #   | Checklist item                                                                 | Reported on page # |
|-------------------------------|-----|-------------------------------------------------------------------------------|--------------------|
| Risk of bias across studies  | 15  | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies). | 5 & 6              |
| Additional analyses           | 16  | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified. | 5 Parag 1          |
| RESULTS                      |     |                                                                               |                    |
| Study selection              | 17  | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram. | 6                  |
| Study characteristics        | 18  | For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations. | 6                  |
| Risk of bias within studies  | 19  | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12). | 10, Par 5          |
| Results of individual studies| 20  | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot. | 10                 |
| Synthesis of results         | 21  | Present results of each meta-analysis done, including confidence intervals and measures of consistency. | 10, Para 1         |
| Risk of bias across studies  | 22  | Present results of any assessment of risk of bias across studies (see Item 15). | 10                 |
| Additional analysis          | 23  | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]). | 10 & 11            |
| DISCUSSION                   |     |                                                                               |                    |
| Summary of evidence          | 24  | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers). | 11 & 12            |
| Limitations                  | 25  | Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias). | 12                 |
| Conclusions                  | 26  | Provide a general interpretation of the results in the context of other evidence, and implications for future research. | 12 & 13            |
| FUNDING                      |     |                                                                               |                    |
| Funding                      | 27  | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review. | 13                 |
| Risk of bias across studies  | 15  | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies). | 5 & 6              |
| Additional analyses          | 16  | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified. | 5 Parag 1          |
| RESULTS                      |     |                                                                               |                    |
| Study selection              | 17  | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram. | 6                  |
| Study characteristics        | 18  | For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations. | 6                  |
| Risk of bias within studies  | 19  | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12). | 10, Par 5          |
| Section                               | Item | Description                                                                                                                                  |
|---------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Results of individual studies         | 20   | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot. |
| Synthesis of results                  | 21   | Present results of each meta-analysis done, including confidence intervals and measures of consistency.                                      |
| Risk of bias across studies           | 22   | Present results of any assessment of risk of bias across studies (see Item 15).                                                               |
| Additional analysis                   | 23   | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).                         |
| DISCUSSION                            |      |                                                                                                                                            |
| Summary of evidence                   | 24   | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers). |
| Limitations                            | 25   | Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias). |
| Conclusions                           | 26   | Provide a general interpretation of the results in the context of other evidence, and implications for future research.                      |
| FUNDING                               |      |                                                                                                                                            |
| Funding                               | 27   | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.   |
**Supplementary file 2: The search strategies and search results in each database**

### 1. PubMed search history

| Search | Query                                                                 | Items found   |
|--------|------------------------------------------------------------------------|---------------|
| #6     | #3 AND #2 AND #1: Humans; English; Adult 18+ years                     | 681           |
| #5     | #3 AND #2 AND #1 Filters: Humans                                       | 2,915         |
| #4     | #3 AND #2 AND #1                                                      | 2,385         |
| #3     | Surgical patients[Mesh] OR Patients Undergoing Surgery[Mesh] OR Surgery[Mesh] OR Surgical Patients[Title/Abstract] OR Patients Undergoing Surgery[Title/Abstract] OR Surgery[Title/Abstract] | 4,000,195     |
| #2     | Preoperative Anxiety[Mesh] OR Anxiety[Mesh] OR Anxiety symptoms[Mesh] OR Anxiety disorder[Mesh] OR General Anxiety disorder[Mesh] OR Mental Health Problems[Mesh] OR Preoperative Anxiety[Title/Abstract] OR Anxiety[Title/Abstract] OR Anxiety symptoms[Title/Abstract] OR Anxiety disorder[Title/Abstract] OR General Anxiety disorder[Title/Abstract] OR Mental Health Problems[Title/Abstract] | 312,808       |
| #1     | Prevalence[Mesh] OR Magnitude[Mesh] OR Epidemiology[Mesh] OR Incidence[Mesh] OR Burden[Mesh] OR Estimates [Mesh] OR Associated factors[Mesh] OR Determinants[Mesh] OR Correlates[Mesh] OR Predictors[Mesh] OR Prevalence[Title/Abstract] OR Magnitude[Title/Abstract] OR Epidemiology[Title/Abstract] OR Incidence[Title/Abstract] OR Burden[Title/Abstract] OR Estimates OR Associated factors[Title/Abstract] OR Determinants[Title/Abstract] OR Correlates[Title/Abstract] OR Predictors[Title/Abstract] | 3,726,562     |

### 2. SCOPUS search history

| Search | Query                                                                 | Items found   |
|--------|------------------------------------------------------------------------|---------------|
| #6     | #5 AND (LIMIT-TO ( LANGUAGE, "English"));                               | 313           |
| #5     | #4 AND (LIMIT-TO ( SUBJECT, "human"));                                 | 987           |
| #4     | #3 AND #2 AND #1                                                      | 1,892         |
| #3     | "Surgical patients" OR "Patients Undergoing Surgery" OR "Surgery"      | 19,114        |
| #2     | "Preoperative Anxiety" OR "Anxiety" OR "Anxiety symptoms" OR "Anxiety disorder" OR "General Anxiety disorder" OR "Mental Health Problems" | 21,138        |
| #1     | "Prevalence" OR "Magnitude" OR "Epidemiology" OR "Incidence" OR "Burden" OR "Estimates" OR "Associated factors" OR "Determinants" OR "Correlates" OR "Predictors" | 8943          |
3. **CINAHL search history**

| Search | Query | Items found |
|--------|-------|-------------|
| S5     | Limiters: Human subject and English language | 384 |
| S4     | S1 AND S2 AND S3 | 843 |
| S3     | (MH "Surgical patients") OR (MH "Patients Undergoing Surgery") OR "Surgery" | 3,421 |
| S2     | (MH "Preoperative Anxiety") OR (MH "Anxiety") OR (MH "Anxiety symptoms") OR (MH "Anxiety disorder") OR (MH "General Anxiety disorder") OR (MH "Mental Health Problems") | 9,124 |
| S1     | (MH "Prevalence") OR (MH "Magnitude") OR (MH "Epidemiology") OR (MH "Incidence") OR (MH "Burden") OR (MH "Estimates") OR (MH "Associated factors") OR (MH "Determinants") OR (MH "Correlates") OR (MH "Predictors") | 7,841 |

4. **PsychINFO search history**

| Search | Query | Items found |
|--------|-------|-------------|
| #5     | Filters: Human subject and English language | 492 |
| #4     | S1 AND S2 AND S3 | 1,231 |
| #3     | (MH "Surgical patients") OR (MH "Patients Undergoing Surgery") OR "Surgery" | 4,574 |
| #2     | (Preoperative Anxiety) OR (Anxiety.tw,id.) OR (Anxiety symptoms.tw,id.) OR (Anxiety disorder.tw,id.) OR (General Anxiety disorder.tw,id.) OR (Mental Health Problems.tw,id.) | 9,457 |
| #1     | (Prevalence) OR (Magnitude) OR (Epidemiology) OR (Incidence) OR (Burden) OR (Estimates) OR (Associated factors) OR (Determinants) OR (Correlates) OR (Predictors) | 12,531 |

5. **Embase search history (Elsevier)**

| No | Query | Results |
|----|-------|---------|
| #6 | #5 AND 'human'/de | 240 |
| #5 | #4 AND [english]/lim | 741 |
| #4 | #1 AND #2 AND #3 | 1,109 |
| #3 | Surgical patients':ti,ab OR Patients Undergoing Surgery':ti,ab OR Surgery':ti,ab OR Surgical Patients':ti,ab OR Patients Undergoing Surgery':ti,ab OR Surgery':ti,ab | 43,865 |
| #2 | 'Preoperative Anxiety':ti,ab OR 'Anxiety':ti,ab OR 'Anxiety symptoms':ti,ab OR 'Anxiety disorder':ti,ab OR 'General Anxiety disorder':ti,ab OR 'Mental Health Problems':ti,ab | 21,143 |
| #1 | 'Prevalence':ti,ab OR 'Magnitude':ti,ab OR 'Epidemiology':ti,ab OR 'Incidence':ti,ab OR 'Burden':ti,ab OR 'Estimates':ti,ab OR 'Associated | 23,421 |
| factors':ti,ab OR 'Determinants':ti,ab OR 'Correlates':ti,ab OR 'Predictors':ti,ab OR 'Prevalence':ti,ab |   |
**Supplementary file 3:** Summary of the agreed level of bias and level of agreement on the methodological qualities of included studies in a meta-analysis based on sampling, outcome, response rate and method of analysis.

| Study                          | Percentage of agreement | Kappa value | Level of agreement |
|--------------------------------|-------------------------|-------------|--------------------|
| Bedaso A. et al (14)           | 75                      | 0.60        | Moderate           |
| Takele G.et al (15)            | 100                     | 1           | Almost perfect     |
| Woldegerima YB. et al (16)     | 100                     | 1           | Almost perfect     |
| Mulugeta H. et al (17)         | 75                      | 0.60        | Moderate           |
| Adesanmi A. et al (36)         | 100                     | 1           | Almost perfect     |
| Nigussie S. et al (5)          | 100                     | 1           | Almost perfect     |
| Ebirim L., Tobin, M (57)       | 100                     | 1           | Almost perfect     |
| Srahbzu M. et al (18)          | 100                     | 1           | Almost perfect     |
| Ryamukuru, David (49)          | 75                      | 0.50        | Moderate           |
| Mellouli et al (50)            | 75                      | 0.60        | Moderate           |
| Dagona, Sabo Saleh (51)        | 100                     | 1           | Almost perfect     |
| Mthias AT et al (61)           | 100                     | 1           | Almost perfect     |
| Carneiro AF et al (52)         | 100                     | 1           | Almost perfect     |
| Ramesh C et al (60)            | 75                      | 0.60        | Moderate           |
| Gonçalves et al (53)           | 100                     | 1           | Almost perfect     |
| Maria Luiza MA et al (54)      | 100                     | 1           | Almost perfect     |
| Caumo W et al (55)             | 75                      | 0.60        | Moderate           |
| Jafar MF et al (11)            | 75                      | 0.60        | Moderate           |
| Maheshwari D, Ismail S (12)    | 100                     | 1           | Almost perfect     |
| Ali A et al (62)               | 100                     | 1           | Almost perfect     |
| Ayman M Y et al (63)           | 75                      | 0.60        | Moderate           |
| Tajigna K et al (59)           | 100                     | 1           | Almost perfect     |
| Le Xu et al (64)               | 100                     | 1           | Almost perfect     |
| Sntos LJF et al (56)           | 100                     | 1           | Almost perfect     |
| Khalili et al (65)             | 100                     | 1           | Almost perfect     |
| Study                  | Score | Kappa | Quality        |
|-----------------------|-------|-------|----------------|
| Arshi et al (58)      | 100   | 1     | Almost perfect |
| Bansal T et al (58)   | 75    | 0.60  | Moderate       |
**Supplementary file 4: Newcastle Ottawa (NOS) critical appraisal evaluation for Cross-sectional studies**

| S.no | Author, Year of publication | Representative ness of the sample | Sample size | Non-responden t | Ascertainment of the exposure (risk factor) | Comparability (Confounding factors are controlled) | Assessment of outcome | Statistical Analysis | Total score |
|------|----------------------------|---------------------------------|-------------|-----------------|---------------------------------------------|---------------------------------------------------|---------------------|-------------------|-------------|
| 1    | Bedaso A. et al [43]       | 1                               | 1           | 0               | 2                                           | 1                                                 | 2                   | 1                 | 8           |
| 2    | Takele G. et al [44]       | 1                               | 1           | 0               | 2                                           | 1                                                 | 1                   | 1                 | 7           |
| 3    | Woldegerima YB. et al [15] | 1                               | 1           | 1               | 2                                           | 1                                                 | 1                   | 1                 | 7           |
| 4    | Mulugeta H. et al [16]     | 1                               | 1           | 1               | 2                                           | 1                                                 | 2                   | 1                 | 9           |
| 5    | Adesanmi A. et al [30]     | 0                               | 1           | 0               | 2                                           | 0                                                 | 2                   | 1                 | 6           |
| 6    | Nigussie S. et al [5]      | 1                               | 1           | 0               | 1                                           | 1                                                 | 2                   | 1                 | 7           |
| 7    | Ebrim L., Tobin, M [49]    | 1                               | 0           | 0               | 2                                           | 1                                                 | 1                   | 1                 | 6           |
| 8    | Srahbzi M. et al [45]      | 1                               | 1           | 0               | 2                                           | 1                                                 | 1                   | 1                 | 7           |
| 9    | Ryamukuru, David [46]      | 1                               | 1           | 0               | 1                                           | 1                                                 | 1                   | 1                 | 6           |
| 10   | Melloul et al [47]         | 1                               | 1           | 0               | 1                                           | 1                                                 | 1                   | 1                 | 6           |
| 11   | Dagona, Sabo Saleh [48]    | 1                               | 1           | 0               | 1                                           | 1                                                 | 1                   | 1                 | 6           |
| 12   | Mthias AT et al [50]       | 1                               | 1           | 0               | 2                                           | 1                                                 | 1                   | 2                 | 8           |
| 13   | Carneiro AF et al [51]     | 1                               | 1           | 0               | 2                                           | 1                                                 | 2                   | 1                 | 8           |
| 14   | Ramesh C et al [52]        | 1                               | 1           | 1               | 2                                           | 1                                                 | 2                   | 1                 | 9           |
| 15   | Gonçalves et al [53]       | 1                               | 1           | 0               | 2                                           | 1                                                 | 1                   | 1                 | 7           |
| 16   | Maria Luiza MA et al [54]  | 1                               | 1           | 0               | 2                                           | 1                                                 | 2                   | 1                 | 8           |
| 17   | Caumo W et al [55]         | 1                               | 1           | 0               | 2                                           | 1                                                 | 2                   | 1                 | 8           |
| 18   | Jafar MF et al [22]        | 1                               | 1           | 0               | 2                                           | 1                                                 | 1                   | 1                 | 7           |
| 19   | Maheshwari D, Ismail S [7] | 1                               | 1           | 0               | 2                                           | 1                                                 | 2                   | 1                 | 8           |
| 20   | Ali A et al [56]           | 1                               | 1           | 1               | 2                                           | 1                                                 | 2                   | 1                 | 9           |
| 21   | Ayman M Y et al [57]       | 1                               | 1           | 0               | 2                                           | 1                                                 | 2                   | 1                 | 8           |
| 22   | Tajna K et al [58]         | 1                               | 1           | 1               | 2                                           | 1                                                 | 2                   | 1                 | 9           |
| 23   | Le Xu et al [59]           | 1                               | 1           | 1               | 2                                           | 1                                                 | 2                   | 1                 | 9           |
| 24   | Santos LJF et al [60]       | 1                               | 1           | 0               | 2                                           | 1                                                 | 2                   | 1                 | 8           |
| 25   | Khalili et al [61]         | 1                               | 1           | 0               | 2                                           | 1                                                 | 1                   | 1                 | 7           |
| 26   | Arshi et al [62]           | 1                               | 1           | 0               | 1                                           | 1                                                 | 1                   | 1                 | 6           |
| 27   | Bansal T et al [62]        | 1                               | 1           | 0               | 2                                           | 1                                                 | 1                   | 1                 | 7           |
NB: NOS score ≥8 (High quality), 6-7 (moderate quality), and ≤5 (low quality)
Supplementary file 5: Factors associated with pre-operative anxiety among patients undergoing surgery in LMICs.

| Author | Key results on factors associated with preoperative anxiety |
|--------|----------------------------------------------------------|
| Bedaso A. et al (14) |  
  - Having strong social support (AOR = 0.16, 95% CI = 0.07-0.34),  
  - Fear of harm from doctor or nurse mistake (AOR = 5.03, 95% CI = 2.85-8.89),  
  - Unexpected result of the surgery (AOR = 3.03, 95% CI = 1.73-5.19),  
  - Fear of unable to recover (AOR = 2.96, 95% CI = 1.18-4.87), and  
  - Need of blood transfusion (AOR = 2.76, 95% CI = 1.65-4.62) |
| Takele G. et al (15) |  
  - Being female (AOR = 3.30, 95% CI = 1.30, 8.34),  
  - Orthopaedics surgery (AOR = 4.24, 95% CI = 1.23, 14.05),  
  - Not having information (AOR = 2.48, 95% CI = 1.11, 5.56),  
  - Postponement of surgery (AOR = 5.53, 95% CI = 1.28, 23.91) and  
  - Not listening music (AOR = 3.41, 95% CI = 1.45, 7.98) |
| Woldegerima et al (16) |  
  - Fear of death (AOR = 2.40, 95% CI = 1.08, 5.32),  
  - Family concern (AOR = 2.15, 95% CI = 1.03, 4.50),  
  - Fear of dependency (AOR = 2.75, 95% CI = 1.57, 7.20) and  
  - Fear of disability (AOR = 2.75, 95% CI = 1.22, 6.21).  
  - Being at the age of 18–30 years (AOR = 6.92, 95% CI = 1.39, 33.82),  
  - Age 31–45 years (AOR = 5.72, 95% CI = 1.61, 20.28),  
  - No income (AOR = 3.21, 95% CI = 1.01, 10.27),  
  - Low income (AOR = 3.06, 95% CI = 1.18, 7.93).  
  - Rural residency (AOR = 0.38, 95% CI = 0.16, 0.89) |
| Mulugeta H. et al (17) |  
  - Being female patients (AOR = 2.19, 95% CI: 1.29, 3.71) and  
  - Lack preoperative information (AOR = 2.03, 95% CI: 1.22, 3.39). |
| Nigussie S. et al (5) |  
  - Being single (β=2.828, 95% CI: 2.149, 8.428), P=0.001),  
  - Divorced marital status (β=5.629, 95% CI: 0.053, 11.205), P<0.048),  
  - Income (β=0.002, 95% CI: 0.001, 0.004), P=0.001,  
  - Time of operation (afternoon) (β=−2.770, 95% CI: −4.906, −0.633), P=0.011),  
  - No preoperative information (β=−2.337, 95% CI: −4.65, −0.018), P=0.04). |
| Srahbu M. et al (18) |  
  - Being female (AOR=1.999, 95% CI: 1.11, 3.57),  
  - Having a chronic medical illness (AOR=3.079, 95% CI: 1.36, 6.92),  
  - Having a family history of mental illness (AOR=2.24, 95% CI: 1.05, 5.4.9),  
  - Lower extremity injury (AOR=2.93, 95% CI: 1.38, 6.21) and  
  - Having severe pain (AOR=2.75, 95% CI: 1.32, 5.74). |
| Ref. | Authors | Findings |
|------|---------|----------|
| Ryamukuru, David (49) | Orthopaedic surgery (OR: 10.22; 95% CI: 1.144, 91.304; P= 0.037).<br>Old patients (OR: 0.22, 95% CI: 0.075, 0.650; P=0.006). | |
| Mellouli et al (50) | High grade of surgery (AOR: 9, 95% CI: 3.4, 23.8) and<br>High level of information requirement (AOR: 1.5, 95% CI: 1.30, 1.70) | |
| Mthias AT et al (61) | Those who having a previous experience of surgery reported less anxiety (p<0.05).<br>Females patients who had a previous surgery were less anxious than those who had never experienced surgery (p=0.011) | |
| Ramesh C et al (60) | Female reported a high level of state anxiety ($X^2$=11.57, p < 0.001) | |
| Gonçalves et al (53) | Women had a significantly higher scores of preoperative anxiety than men (p=0.003).<br>There is a significantly higher difference in anxiety in the group of patients who had undergone previous heart surgery (p=0.012) and among smokers (p=0.039). | |
| Caumo W et al (55) | A history of cancer (AOR=2.26; 95%CI: 1.43–3.57),<br>Being female gender (AOR: 2, 95% CI: 1.24, 3.26) and<br>A history of smoking (AOR=7.47, 95% CI: 1.47, 37.81) | |
| Fathi M et al (68) | Being females (r= 0.80, P< 0.001) and<br>Older patients (r= 0.226, P<0.001) had significant correlation with anxiety. | |
| Maheshwari et al (12) | Age ≤ 25 years (AOR: 3.11, 95%CI: 1.03, 9.32, P= 0.04),<br>Nulli and primiparous (AOR: 2.87, 95%CI: 1.38, 5.98, P=0.05),<br>General anaesthesia in previous surgery (AOR: 4.29, 95% CI: 1.93, 9.53)<br>No previous surgery (AOR: 14.72, 95% CI: 3.13, 69.28) and<br>Source of information from non-anaesthetist (AOR: 0.18, 95%CI: 0.07, 0.45) | |
| Ocalan R et al (67) | Age (r= −0.326, P=0.011),<br>Educational level (r=0.258, P=0.046),<br>Immediate (r=0.715, P<0.001) and late (r=0.605, P<0.001) postoperative pain had significant correlation with preoperative anxiety. | |
| Ali A et al (62) | A significant positive correlation was found between the days of hospitalization and preoperative score (r= 0.370, P= 0.001). | |
| Erkilic E et al (66) | Being women and less educated patients undergoing surgery had significant association with preoperative anxiety (P<0.05). | |
| Authors          | Findings                                                                 |
|-----------------|--------------------------------------------------------------------------|
| Sntos LJF et al | - Gastrointestinal problems ($r=0.3975$, $P<0.05$) and                  |
| [60]            |   - Sexual problem ($r=0.4017$, $P<0.05$) had a moderate correlation with anxiety |
| Khalili et al   | - Old age (OR $= 0.95$, 95%CI: 0.93, 0.97),                               |
| (65)            |   - Female gender (OR: 2.33, 95%CI: 1.26, 4.29),                         |
|                 |   - Urban residence (OR: 3.73, 95%CI: 1.65, 8.44) and                   |
|                 |   - Inadequate patients’ awareness about adverse effect of anaesthesia (OR: 3.43, 95%CI: 1.53, 7.67; $p<0.05$). |