

# Preoperative anxiety in Ethiopia: a systematic review and meta-analysis

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## Research article

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# Abstract

**Background:** Anxiety is a vague and uneasy feeling of the individual. It is one of the commonest events that can happen to surgical patients. The prevalence is higher in low-income countries. In Ethiopia, the prevalence of preoperative anxiety reported is variable. This meta-analysis aimed to find the pooled prevalence of preoperative anxiety.

**Methods:** The databases for the search were PubMed, Web of Science, and Google Scholar by the date 02/03/2020. To assess publication bias Egger's test regression analysis was applied.

**Results:** This meta-analysis included a total of 6 studies with 1832 study subjects. The pooled prevalence of preoperative anxiety was 55.54 % (95% CI, 46.30 to 64.78%). Based on the subgroup analysis, the Oromia region ranked first (63.27%).

**Conclusions:** The national prevalence of preoperative anxiety was high. Oromia region ranked first followed by Amhara, SNNP, and Addis Ababa. Patients need to assess often for anxiety during the preoperative visit.

## Background

Perioperative anxiety is a vague, and uneasy feeling of the individual[1]. It is one of the global health problems and a prevalent concern with negative effects but ignored[2]. It is worrying events for most surgical patients[3]. Preoperative anxiety is a challenging problem in the preoperative care of patients[4]. In certain types of surgery, anxiety increases postoperative morbidity and mortality[5]. Most patients in the preoperative phase experience anxiety[6]. A low level of anxiety is an expected reaction to especially for a patient's first surgical experience[7]. Yet, Preoperative anxiety has a great influence on surgery outcomes[8]. Higher levels of preoperative anxiety result in delay wound healing[7].

In the preoperative period anxiety can lead to an unstable hemodynamic status[9]. Studies have shown that preoperative anxiety causes suppression of the immune system[10]. Due to the reasons mentioned above, it considered major morbidity after surgery [11]. Preoperative anxiety is also known to increase the patient's release of catecholamines[3]. This increases blood pressure, heart rate, blood glucose levels, and arrhythmia of infection [12]. It also increases the anesthetic need and hospital stay [13]. Besides, it surges the economic burden and impaired quality of life of the patients[14, 15]. The main sources of pre-operative anxiety are lack of knowledge, risk of death, pain, and body image [16].

Effective perioperative nursing care activities have implemented in national and international settings. These are because of providing better environments and quality of life [17]. Notable, Preoperative education, psychological support, better social support and answer questions [18, 19]. Yet, waiting for surgery, anesthesia, concerns about surgical intervention, and postoperative pain[15]. Despite the growing advancements of surgical and anesthetic techniques, surgery remains stressful[9].

A first global report claimed that preoperative anxiety is the most major problems. This has shown that it occurred in every type of surgical procedure[20]. Its burden reported both in developed and developing countries. In China, preoperative anxiety reported as 20%[21], 21% in Saudi Arabia[22], 36.5 in Iran[9], 31% in India[13], and 62.8% in Pakistan[23]. In Africa it reported as 51.0% in Nigeria[24], 67.5% in Tunisia[25], 57% in Kenya[26] and 72.8% in Rwanda[27].

In Ethiopia, different studies had conducted to find the prevalence of preoperative anxiety. The prevalence found in the range between 39.8% to 70.3% [28-33] in the Ethiopian setting. Hence, discrepancies between studies make difficult to represent the national prevalence. Having national representative data is real to underpin effective prevention strategies. Thus, need to have a pooled estimation of preoperative anxiety at the country level. This analysis aimed to find the pooled prevalence of preoperative anxiety in the Ethiopian setting. The review question was what is the prevalence for preoperative anxiety in Ethiopia?

## Methods

### Reporting

The Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guideline[34] used to report this meta-analysis(Additional file 1 research checklist).

### Literature search

The databases for the search were Medline (PubMed), Web of Science, and Google Scholar. The terms for the search were pre-defined for a comprehensive search strategy. These included all fields within records and Medical Subject Headings (MeSH terms). In the Boolean operator, within each axis, we combined keywords with the "OR" operator. Then we linked the search strategies for the two axes with the "AND" operator. The search terms used for the search were "Preoperative anxiety" OR "anxiety" OR "surgical anxiety" OR "pre-surgical anxiety" OR "preoperative worry" OR "concerns" OR "nervousness" AND "prevalence" OR "magnitude" OR "burden" AND "Ethiopia". The specific searching detail in PubMed with MeSH terms was ("Preoperative anxiety" [MeSH Terms] OR "anxiety"[MeSH Terms] OR "surgical anxiety"[MeSH Terms] OR "pre-surgical anxiety"[MeSH Terms] OR "preoperative worry"[MeSH Terms] OR "concerns"[MeSH Terms] OR "nervousness"[MeSH Terms] AND "prevalence" [All Fields]) OR "magnitude"[MeSH Terms]OR "burden"[MeSH Terms] AND ("Ethiopia" [MeSH Terms] by the date 02/03/2020.

The publication year of the studies was not limited during the search.

### Study selection

All retrieved studies were exported to Endnote version 7 reference manager. It is the study selection method that we used to remove duplicated studies.

The retrieved articles were screened according to pre-defined inclusion and exclusion criteria. Discussion and/or involvement of the third reviewer resolved any disagreements.

### **Eligibility criteria**

#### **Inclusion criteria**

Included studies were articles that reported the prevalence of preoperative anxiety. It also included studies published in English and studies conducted only in Ethiopia.

#### **Exclusion criteria**

Excluded criteria were articles without full-text available and qualitative studies. Other excluded criteria were any reviews, commentaries, consultants' corners, letters, and conference abstracts.

#### **Quality assessment**

We used Joanna Brigg's Institute (JBI) quality appraisal criteria[35]. It is the assessment tool used to check the quality of each article. The tool consists of nine major items. The first item is appropriate to the sample frame. The second is the appropriate sampling technique. The third is the adequacy of the sample size. The fourth is a description of the study subjects and settings. The fifth is enough coverage of data analysis. The sixth is the validity of the method for identification of the condition. The seventh item is a standard and reliable measurement for all participants. The eighth is the appropriateness of statistical analysis. And the last item is adequacy and management of response rate. Studies considered low-risk when it would fit 5 or above quality assessment checklists.

#### **Data extraction**

A standardized form used to extract data by two authors. The following information from each article was extracted. Such as first author, and publication year, the study design, and study population. The locations of the study were also extracted.

#### **Outcome measurement**

The major outcome is to determine the prevalence of preoperative anxiety in Ethiopia. It calculated as dividing the numbers of patients who develop anxiety to the total number of patients multiply by 100. A total number of patients refer to all adult elective patients during the study period. Preoperative anxiety is an event, a person presents with signs and symptoms of the anxiety[36]

#### **Data analysis**

The required data were collected using a Microsoft Excel 2010 workbook form. Then, the STATA Version11 software was used to analyze the data. The original articles presented using tables and forest plots. A weighted inverse variance random-effects model[37] used to estimate the pooled prevalence.  $I^2$

statistics used to assess the percentage of total variation across studies [38].  $I^2 \leq 25\%$  suggested more homogeneity.  $25\% < I^2 \leq 75\%$  suggested moderate heterogeneity, and  $I^2 > 75\%$  suggested high heterogeneity[38]. Egger's regression test was also used to assess publication bias [39]. Furthermore, the sub-group analysis carried out based on the region of studies. This reduces the random discrepancies between the point estimates of the primary study.

## Results

### Literature search result

A comprehensive literature search of the database yielded a total of 75 publications. Among these, 69 disregarded due to qualitative study, abstracts, and titles. Finally, this meta-analysis includes a total of 6 studies with 1832 subjects [28-33](Figure 1).

### Characteristics of included studies

The range of publication year for included studies was from 2014 to 2019. Three regions and Addis Ababa was the settings studies found. Two in Oromia region[30, 33], two in Amhara region[31, 32], one in Addis Ababa[28], and one in Southern Nation, Nationalities, and People (SNNP)[29]. All included studies done by using the cross-sectional study design (Table 1).

Table 1: Characteristics of included studies in the meta-analysis of preoperative anxiety.

Author/ Year	Study year	Region	Study design	Sample size	Prevalence	Surgery type
Srahbzu M et.al/2018[ 28]	May to June, 2017	Addis Ababa	Cross-sectional	423	39.8	Orthopedic trauma patients scheduled for elective surgery
Mulugeta H et al/2018[ 32]	February to April, 2017	Amhara	Cross-sectional	353	61	All adults scheduled for elective surgery
Takele G/2019[ 30]	March to May, 2018	Oromia	Cross-sectional	237	56.12	All adults scheduled for elective surgery
Nigussie S et al/2014[ 33]	February to April, 2012	Oromia	Cross-sectional	239	70.3	All adults scheduled for elective surgery
Woldegerima Y.B et al/2018[ 31]	March to June, 2017	Amhara	Cross-sectional	178	59.6	All adults scheduled for elective surgery
Bedaso A et al/2019[ 29]	November to Dec, 2018	SNNP	Cross-sectional	402	47	All adults scheduled for elective surgery

We did an assessment of studies with JBI quality appraisal checklists. Based on this, none of the included studies was poor quality status.

### Meta-analysis

The absence of publication bias was assessed with Egger's regression test ( $p = 0.201$ ), which showed that no publication bias.

The pooled prevalence of preoperative anxiety estimated from 6 studies [28-33] was 55.54 % (95% CI, 46.30 to 64.78%)(Figure 2).

### Subgroup analysis

Based on the subgroup analysis, the Oromia region ranked first (63.27%). Followed by Amhara (60.53%), and SNNP (47.00%). The report of the lowest prevalence was from the Addid Ababa (39.80%)(Figure3).

## Discussion

Preoperative anxiety continues a global burden of perioperative care. It is a common problem that affects surgical patients and results in adverse outcomes[40].

According to this meta-analysis, preoperative anxiety found was 55.54% (46.30, 64.78) in Ethiopia. This is comparable with the study conducted in Nigeria[24] and Kenya[26]. Factors of preoperative anxiety like financial loss, poor behavioral adherence during Factors of preoperative anxiety almost similar in developing countries including Ethiopia[33, 41]. This includes financial loss, prolonged hospital stay and adverse postoperative outcomes.

This finding is lower than a study conducted in Tunisia[25], Pakistan[23] and Rwanda[27]. This discrepancy might be due to the difference in the study setting and population. In the current study, the prevalence estimated from all elective waiting surgical patients. In later, the prevalence of preoperative anxiety estimated from specific cases. Involved cases are hernia, thyroid and cardiac surgeries.

The current finding is higher than the study from China[21], Saudi Arabia[22], India[13] and Iran[9]. This difference might be due to the lack of preoperative anxiety control guidelines. Evidence shows that, anxiety evaluation should be incorporated in preoperative assessment of the patients[12, 42]. Moreover, clinical negligence[43] might increases preoperative anxiety. But not reiterate instructions, use relaxation techniques like slow and deep breathing [44].

Based on the subgroup analysis, the regional prevalence was also determined. The highest prevalence of preoperative anxiety noted in the Oromia region (63.27%). This is almost two times higher than a result of Addis Ababa (39.80%). This might be the study population in the Oromia was all elective surgery patients. But, the studies done in Addis Ababa were orthopedic trauma patients.

Due to the lack of studies in some locations of Ethiopia, the result may not represent a national figure. Although  $I^2$  is not an absolute measure of heterogeneity, high heterogeneity was observed.

## Conclusion

In this finding, prevalence of preoperative anxiety was higher compared to the STAI[45]. Oromia region ranked first followed by Amhara, SNNPR, and Addis Ababa. Thus, efforts should make to ensure the prevention of preoperative anxiety. Furthermore, nurses must spend a considerable amount of time working with preoperative patients. It is imperative, thus, nurses take training about the most effective strategies. Finally, due to its implications on postoperative outcomes, anxiety evaluation should incorporate.

## Abbreviations

CI: Confidence Interval; SNNPR: Southern Nations and Nationalities of People Region; STAI: Stata-Trait Anxiety Inventory

## Declarations

**Ethical approval and consent to participate:** Not applicable.

**Consent for publication:** Not applicable

**Availability of data and materials:** All datasets analyzed during this study are presented within the manuscript and/or additional supporting file.

**Competing interests:** The author declares that, they have no competing interests

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**Authors' contributions:** YB design and planning of the study, review of the literature. More to the point YB contributes data analysis and drafting manuscript. KG contributes literature review, data collection and took part to realize statistical analysis. Both authors have read and approved the manuscript.

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## References

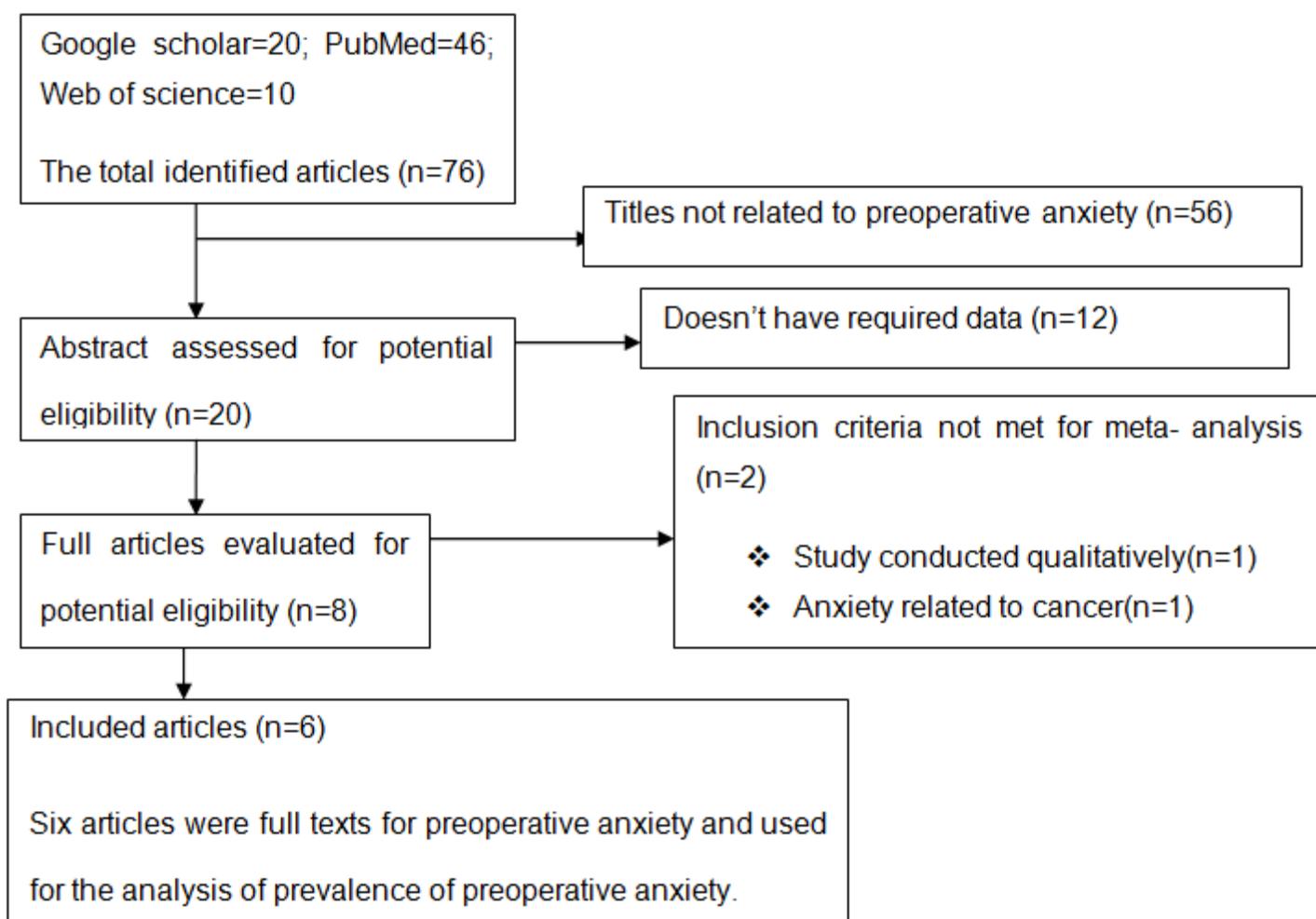
1. Klopfenstein CE, Forster A, Van GesselE. Anesthetic assessment in an outpatient consultation clinic reduces preoperative anxiety. *Canadian Journal of Anesthesia* 2000, 47(6):511.
2. Cevik B: The evaluation of anxiety levels and determinant factors in preoperative patients. *International Journal of Medical Research & Health Sciences* 2018, 7(1):135-143.
3. Wetsch WA, Pircher I, Lederer W, Kinzl J, Traweger C, Heinz-Erian P, BenzerA. Preoperative stress and anxiety in day-care patients and inpatients undergoing fast-track surgery. *British journal of anaesthesia* 2009, 103(2):199-205.
4. Zeb A, Hammad AM, Baig R, RahmanS. Pre-Operative Anxiety in Patients at Tertiary Care Hospital, Peshawar. *Pakistan J Clin Trials Res* 2019, 2(2):76-80.
5. Stamenkovic DM, Rancic NK, Latas MB, Neskovic V, Rondovic GM, Wu JD, CattanoD. Preoperative anxiety and implications on postoperative recovery. What can we do to change our history. *Minerva anesthesiologica* 2018, 84(11):1307-1317.
6. Gonçalves KKN, da Silva JI, Gomes ET, de Souza Pinheiro LL, Figueiredo TR, da Silva Bezerra SMM. Anxiety in the preoperative period of heart surgery. *Revista brasileira de enfermagem* 2016, 69(2):374.
7. Tanaka N, Ohno Y, Hori M, Utada M, Ito K, SuzukiT. High preoperative anxiety level and the risk of intraoperative hypothermia. 2012.
8. Ali A, Altun D, Oguz BH, Ilhan M, Demircan F, KoltkaK. The effect of preoperative anxiety on postoperative analgesia and anesthesia recovery. *Journal of anesthesia* 2014, 28(2):222-227.
9. Khalili N, Karvandian K, Ardebili HE, Eftekhar N, NabavianO. Predictive Factors of Preoperative Anxiety in the Anesthesia Clinic. A Survey of 231 Surgical Candidates. *Archives of Anesthesia and Critical Care* 2019.

10. Hughes BM, Howard S, James JE, Higgins NM. Individual differences in adaptation of cardiovascular responses to stress. *Biological Psychology* 2011, 86(2):129-136.
11. Weissman C: The metabolic response to stress: an overview and update. *Anesthesiology* 1990, 73(2):308-327.
12. Kuzminskaitė V, Kaklauskaitė J, Petkevičiūtė J. Incidence and features of preoperative anxiety in patients. *Acta medica Lituanica* 2019, 26(1):93.
13. Vadhanan P, Tripaty DK, Balakrishnan K. Pre-operative anxiety amongst patients in a tertiary care hospital in India. *Journal of Society of Anesthesiologists of Nepal* 2017, 4(1):5-10.
14. Antony MM, Stein MB. *Oxford handbook of anxiety and related disorders*. Oxford University Press; 2008.
15. Jawaid M, Mushtaq A, Mukhtar S, Khan Z: Preoperative anxiety before elective surgery. *Neurosciences* 2007, 12(2):145-148.
16. Ertürk EB, Ünlü H: Effects of pre-operative individualized education on anxiety and pain severity. *International journal of health sciences* 2018, 12(4):26.
17. Garrett Jr JH: Effective perioperative communication to enhance patient care. *AORN journal* 2016, 104(2):111-120.
18. D'Alesandro M: Simple steps to reduce anxiety in the surgical patient. *Or Nurse* 2015, 9(2).
19. Bailey L: Strategies for decreasing patient anxiety in the perioperative setting. *AORN journal* 2010, 92(4):445-460.
20. Celik F, Edipoglu IS. Evaluation of preoperative anxiety and fear of anesthesia using APAIS score. *European journal of medical research* 2018, 23(1):41.
21. Wang Y, Shen J, Lu J, Yang X. Preoperative anxiety and depression in patients undergoing cardiac surgery. *Zhonghua yi xue za zhi* 2008, 88(39):2759-2762.
22. Almalki MS, Hakami OAO, Al-Amri AM. Assessment of preoperative anxiety among patients undergoing elective surgery. *The Egyptian Journal of Hospital Medicine* 2017, 69(4):2329-2333.
23. Kanwal A, Asghar A, Ashraf A, Qadoos A. Prevalence of preoperative anxiety and its causes among surgical patients presenting in Rawalpindi. *Journal of Rawalpindi Medical College* 2018, 22(S-2):64-67.
24. Akinsulore A, Owojuyigbe AM, Faponle AF, Fatoye FO. Assessment of preoperative and postoperative anxiety among elective major surgery patients in a tertiary hospital in Nigeria. *Middle East J Anaesthesiol* 2015, 23(2):235-240.
25. Zammit N, Menel M, Rania F. Preoperative Anxiety in the Tertiary Care Hospitals of Sousse, Tunisia: Prevalence and Predictors. *SOJ Surgery* 2018, 5(1):1-5.
26. Chanda C: Assessment of preoperative anxiety amongst patients presenting for elective surgery at the Kenyatta National Hospital. University of Nairobi, Kenya; 2012.
27. Ryamukuru D, Ndateba I, Mukamana D, Mukantwari J, Adejumo O, Collins A: Assessment of anxiety in patients awaiting surgery in a referral hospital in Rwanda. *Rwanda Journal of Medicine and*

- Health Sciences 2019, 2(2):112-117.
28. Srahbzu M, Yigizaw N, Fanta T, Assefa D, Tirfeneh E: Prevalence of depression and anxiety and associated factors among patients visiting orthopedic outpatient clinic at Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia, 2017. *J Psychiatry*. 21: 450. *J Psychiatry* 2018, 21(450):2.
  29. Bedaso A, Ayalew M. Preoperative anxiety among adult patients undergoing elective surgery. A prospective survey at a general hospital in Ethiopia. *Patient safety in surgery* 2019, 13(1):18.
  30. Takele G NA, Ayelegne D, Boru B: Preoperative Anxiety and its Associated Factors among Patients Waiting Elective Surgery in St. Luke's Catholic Hospital and Nursing College, Woliso, Oromia, Ethiopia, 2018. *Emergency medicine ana critical care* 2019, 4.1(2020):21-37.
  31. Woldegerima Y, Fitwi G, Yimer H, Hailekiros A: Prevalence and factors associated with preoperative anxiety among elective surgical patients at University of Gondar Hospital. Gondar, Northwest Ethiopia, 2017. A cross-sectional study. *International Journal of Surgery Open* 2018, 10:21-29.
  32. Mulugeta H, Ayana M, Sintayehu M, Dessie G, Zewdu T: Preoperative anxiety and associated factors among adult surgical patients in Debre Markos and Felege Hiwot referral hospitals, Northwest Ethiopia. *BMC anesthesiology* 2018, 18(1):155.
  33. Nigussie S, Belachew T, Wolancho W: Predictors of preoperative anxiety among surgical patients in Jimma University specialized teaching hospital, South Western Ethiopia. *BMC surgery* 2014, 14(1):67.
  34. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, Ioannidis JP, Clarke M, Devereaux PJ, Kleijnen J, Moher D: The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS medicine* 2009, 6(7):e1000100.
  35. Pearson A, Wiechula R, Court A, Lockwood C: The JBI model of evidence-based healthcare. *International Journal of Evidence-Based Healthcare* 2005, 3(8):207-215.
  36. Rose M, Devine J: Assessment of patient-reported symptoms of anxiety. *Dialogues in clinical neuroscience* 2014, 16(2):197.
  37. DerSimonian R, Kacker R: Random-effects model for meta-analysis of clinical trials: an update. *Contemporary clinical trials* 2007, 28(2):105-114.
  38. Higgins JP, Thompson SG, Deeks JJ, Altman DG: Measuring inconsistency in meta-analyses. *BMJ: British Medical Journal* 2003, 327(7414):557.
  39. Peters JL, Sutton AJ, Jones DR, Abrams KR, Rushton L. Comparison of two methods to detect publication bias in meta-analysis. *Jama* 2006, 295(6):676-680.
  40. Spanner S, Sayer L: Is the Amsterdam Preoperative Anxiety and Information Scale (APAIS) a Valid Tool in Guiding the Management of Preoperative Anxiety in Adult Patients. A Literature Review. *Journal of Nursing and Practice* 2019, 3(1).
  41. Sigdel S: Perioperative anxiety: A short review. *Glob Anaesth Perioper Med* 2015, 1(10.15761).

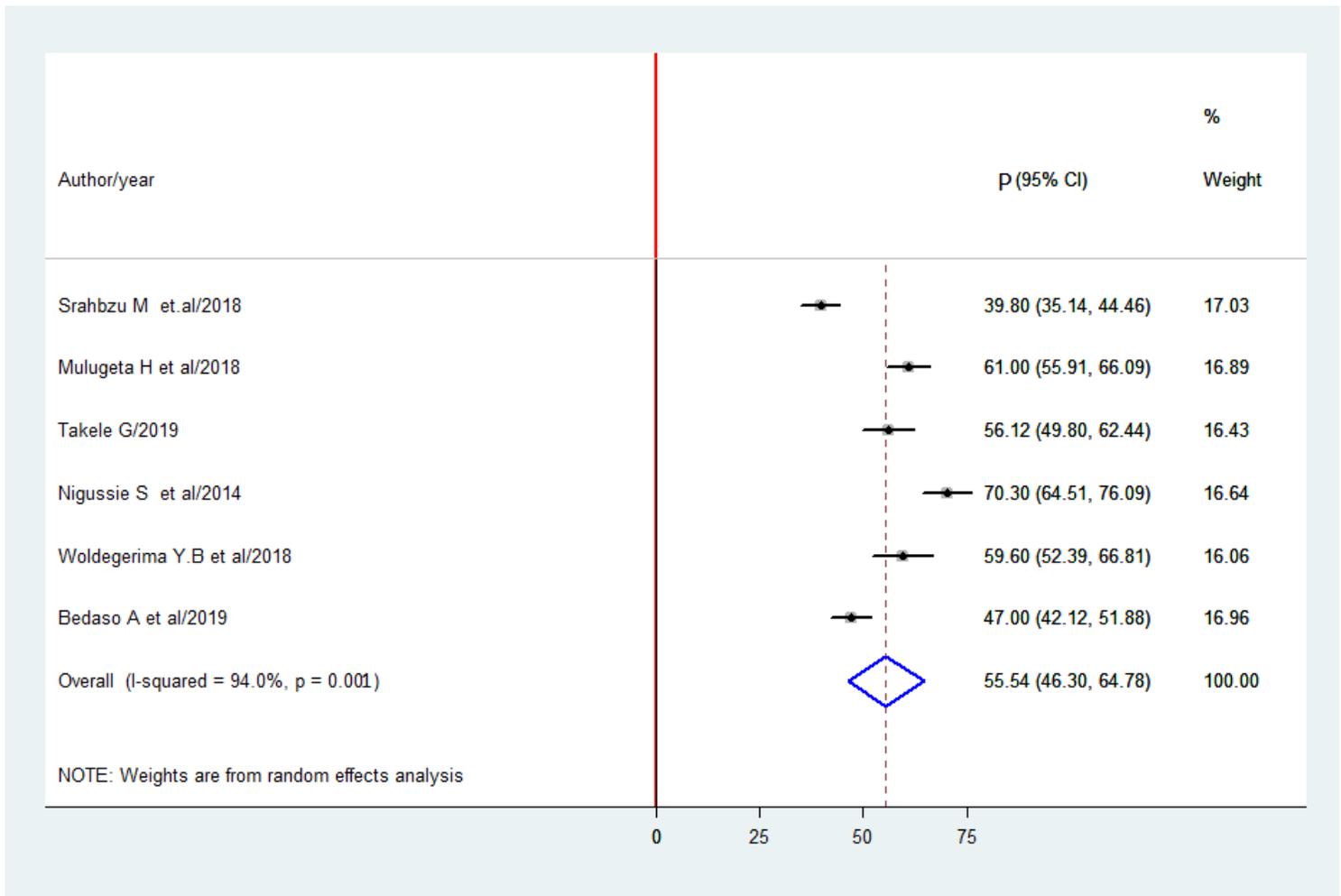
42. Guarracino F, Baldassarri R, Priebe H. Revised ESC/ESA Guidelines on non-cardiac surgery. cardiovascular assessment and management. Implications for preoperative clinical evaluation. *Minerva Anesthesiol* 2015, 81(2):226-233.
43. Spouse J, Cook MJ, Cox C. *Common Foundation Studies in Nursing E-Book*. Elsevier Health Sciences; 2008.
44. Aust H, Rüsçh D, Schuster M, Sturm T, Brehm F, Nestoriuc Y: Coping strategies in anxious surgical patients. *BMC health services research* 2016, 16(1):250.
45. Julian LJ. Measures of anxiety. State-trait anxiety inventory (STAI), Beck anxiety inventory (BAI), and Hospital anxiety and Depression scale-anxiety (HADS-A). *Arthritis care & research* 2011, 63(S11):S467-S472.

## Figures



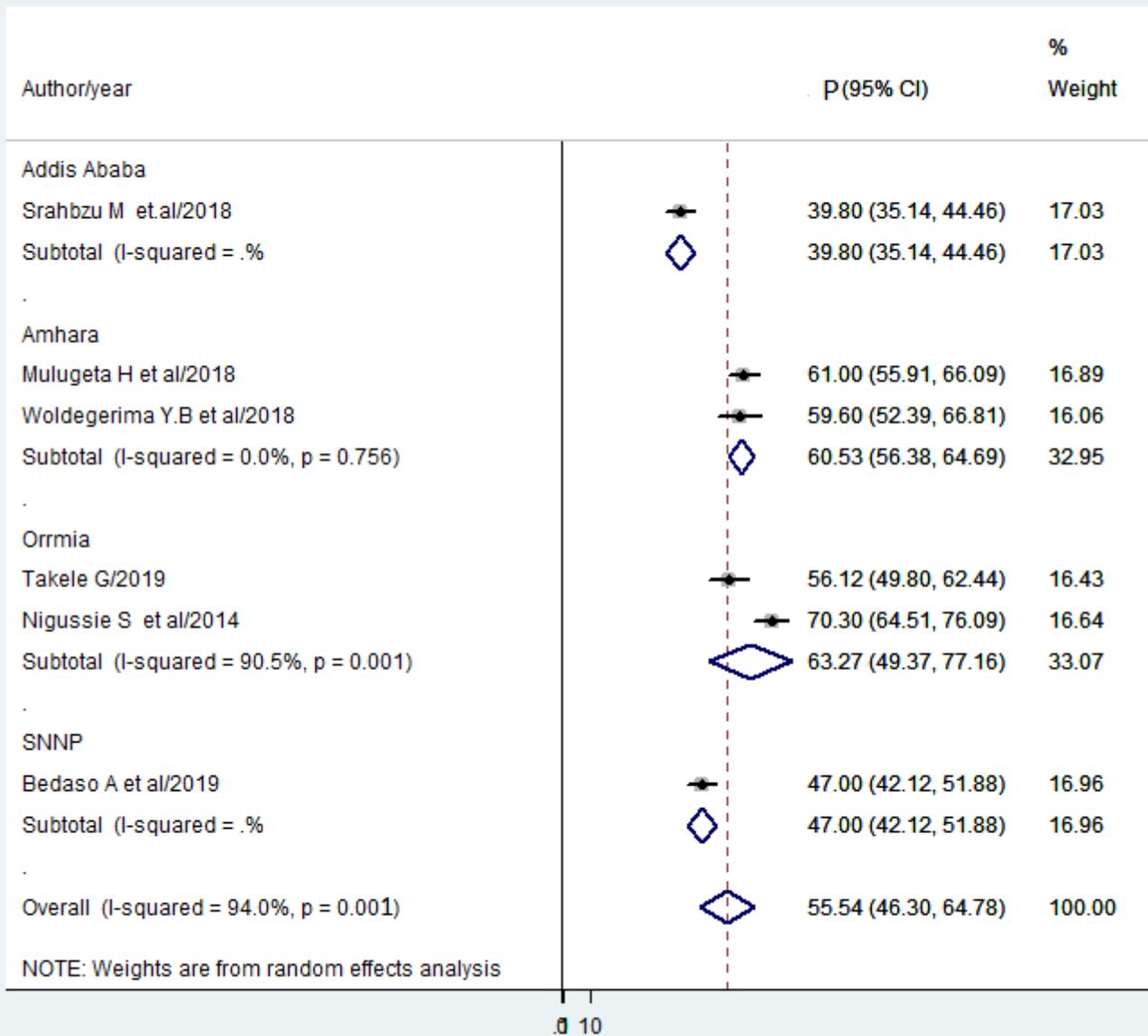
**Figure 1**

Flow chart of the literature search of articles included in a meta-analysis of preoperative anxiety.



**Figure 2**

Forest plot of prevalence with corresponding 95% CIs of the six studies on preoperative anxiety. The midpoint and the length of each segment indicated prevalence and a 95% CI. The diamond shape showed the combined prevalence of all studies.



**Figure 3**

Forest plot of prevalence with corresponding 95% CIs on the region. The midpoint and the length of each segment indicated prevalence and a 95% CI. The diamond shape showed the combined prevalence of all studies.

## Supplementary Files

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