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REVIEW ARTICLE

Prevalence of Anxiety Disorders in Iranian Men in the Last 10 Years: A Systematic Review and Meta-Analysis

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Abstract: **Objective:** To conduct a systematic review and meta-analysis to provide an estimate of the prevalence of anxiety disorders during 2010-2020 among Iranian men. **Methods:** We searched international and national databases including PubMed, Scopus, Cochrane library, SID, and Magiran with related keywords. The selected studies were also qualitatively evaluated using the Newcastle-Ottawa Scale (NOS) checklist. I2 test was used to measure the heterogeneity of the studies and a random strategy for meta-analysis was considered using the result. **Results:** We reviewed 782 articles identified through our search. Then, 51 articles were selected according to the inclusion criteria and, data were extracted from 24 articles. After carefully reviewing these articles, 24 articles were ultimately selected for meta-analysis. The overall estimated prevalence of anxiety among men was 12% (95% CI: 0.11, 0.13). The highest prevalence of anxiety was 50% (95%CI: 0.38-0.62) in Tehran and the lowest prevalence of anxiety was 0.014% (95%CI:0.003-0.025) in Shiraz. **Conclusions:** Anxiety disorders are common and the substantive identified here explain much of the prevalence of mental disorders. These results showed the potential in men to suffer from anxiety disorders.

Keywords: Anxiety disorders; Iranian men; Systematic review; Meta-analysis

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1. Introduction

Mental health is highly important around the world (1, 2). Anxiety disorders are a group of psychological problems characterized by feelings of extreme anxiety and fear. Anxiety and fear about the future are among the features anxiety disorders. There are several types of anxiety disorders, with their own characteristics. Anxiety disorders are often associated with psychological conditions, especially depressive disorder (1). Many disabilities, chronic disorders, and mortality are related to depression (3). Depression, anxiety, and stress lead to reduced quality of life and have negative impacts on people's health, performance, and efficiency (4). In Iran, one in five adults, particularly women, suffer from common mental disorders in their lifetime. These reports have revealed that anxiety and depressive symptoms affect about 21% and 20.8% of the adult population, respectively(5). Sanaeei et al. aim to assess the association between adherence to healthy eating guidelines, as measured by Alternative Healthy Eating Index (AHEI)-2010, and prevalence of anxiety and depression in a large sample of Iranian adults. They found a significant inverse association between adherence to AHEI-2010 and odds of anxiety and depression among Iranian adults. This associ-

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ation showed a significant difference even after adjustments for potential confounders, including energy intake and body mass index (BMI). In stratified analysis, they found protective associations between adherence to AHEI-2010 and mental disorders in women, as well as in individuals who were 40 years old or younger (6).

Studies have shown the relationship between consumption of whole and refined grains and psychological disorders in Iranian adults. A significant inverse relationship was found between the average consumption of whole grains (third quarter) and anxiety among women. Consumption of refined grains was associated with depression and anxiety in women. Such relationships are not observed in men (7). Several studies have examined modifiable lifestyle factors associated with mental illness as well as the association between lifestyle and mental health factors. Non-smokers with low levels of psychological distress and healthy diet are less likely to have anxiety and depression, compared to smokers and those with psychological distress or unhealthy diets, respectively (3).

Mental health in medical students is noteworthy because of exposure to several stressors during the years of study. Studies have shown that the mental health of medical students of Shiraz University of Medical Sciences is poor (6). Currently, new social behaviors such as prolonged listening to music, eating a lot of fast food, lack of attention to religion, consumerism, intense attention to the body, and inactivity have led to new lifestyles that lead to mental disorders (8). The current study was conducted to investigate the prevalence of anxiety disorders during 2010-2020 in Iranian men.

2. Method

To collect all the published articles on the prevalence of anxiety disorders in Iranian men in the last 10 years, international and national databases including PubMed, Scopus, Cochrane library, SID, and Magiran were searched by two independent researchers. Keywords used included anxiety disorders, prevalence, male and Iran, in English and Persian sources. The articles found were screened by two independent researchers. We included studies reporting the prevalence of a type or one of the anxiety disorders in the male subgroup, studies on Iranian participants. Articles that did not report the prevalence by sex and were published more than 10 years ago were excluded from the study.

A table was then prepared to extract information from selected articles, including the name of the first author, year of publication, place of study, sample size, age range of study participants, prevalence, the name of the anxiety scale, and 95% confidence interval (CI).

CIDI , CHQ , HADS , DASS , and BDI were the questionnaires that were included to measure anxiety in the articles, in addition after consulting with the team psychiatrist, these articles were included in the present study. The selected studies were also qualitatively evaluated using the Newcastle-Ottawa Scale (NOS) checklist as described in a previous study (9). I2 test was used to measure the heterogeneity of the studies and a random strategy for meta-analysis was considered using the result. Then, using Stata software version 14 (Stata Corp., College Station, TX, USA), the prevalence mentioned in different subgroups was combined using a weighted average and a meta-analysis was performed, and the Forest plot was drawn. In the diagram, the size of the squares indicated the sample size and the horizontal lines indicated a 95% confidence interval.

3. Results

Initially, 782 articles were found in the electronic search. After checking for duplicate articles, 258 duplicate articles were discarded and 524 articles were screened by the researcher. From these articles, 51 articles were selected according to the inclusion criteria, and data were extracted from 23 articles. After carefully reviewing these articles, finally, 23 articles could be selected for the meta-analysis. Figure 1 and table 2 show the article selection process and summary of articles in the meta-analysis, respectively.

Since the prevalence of anxiety and the number of samples were extracted in each study, a binomial distribution was used to calculate the variance of each study. The heterogeneity of the study was estimated to be 98.6% using the I2 test. Since the studies were heterogeneous, the Random-effects model was used to combine the results of the studies. The overall prevalence of anxiety in these studies was 12% with a confidence interval of 0.11-0.13. The highest prevalence of anxiety was 50% (CI:0.38-0.61) in Tehran and the lowest prevalence of anxiety was 0.014% (CI:0.003-0.025) in Shiraz (Table 1 and Figure 2).

4. Discussion

As mentioned, anxiety alone can reduce a person's quality of life, but it is usually associated with other mental disorders and provides the background for a further decline in quality of life and is even a risk factor for other non-communicable diseases such as obesity and a range of cardiovascular diseases including coronary heart disease, heart failure, and stroke(10).

According to the disease burden report, about 2.5% of disability-adjusted life years (DALY) in Iranian men is related to anxiety disorders. In the present study, it was found that on average 12% of Iranian men suffer from one of the anxiety disorders, which is completely consistent with the results of the latest National Survey of Mental Illness conducted in 2018 reporting a prevalence of 12% (CI: 10.6 -13.4) for com-

mon anxiety disorders in men (1).

Previous studies have shown that anxiety disorders, especially in women, are more common in young people, but the results of a national survey study indicate that these disorders are more common in middle-aged men. Although no subgroup analyzes have been performed in the present study, one of the prominent results in this field is the study of Larijani and colleagues. The sample size was small and the reason for its high rate may be related to the age and student population that was studied. In this study, it was found that there was an inverse relationship between students' sense of courage and the severity of anxiety. It has also been found that the level of education of parents, especially fathers, is a determining factor in the development of anxiety in children (11). Risk factors for anxiety in men follow different patterns than in women. In men, the history of previous marriages is an important factor, but not in women.

We found that university education was associated with a 50% reduction in the prevalence of anxiety in men (19.3% vs. 10.5%) and unemployment almost doubles the prevalence of anxiety in men (10.9% vs. 20.5%). While there was no significant difference between the prevalence of anxiety in illiterate and academic women (17.7% vs. 16%)(1).

Furthermore, men generally pay less attention to their health issues, especially mental health, and it has been proven that unlike developed countries in Iran, anxiety in men leads to more sick leave than women (1). Preventive measures, especially job stability and improving literacy and encouraging men to use mental health services, especially in people who are prone to it, such as the illiterate and the unemployed cannot only reduce the burden of mental illness but also improve the indicators of other illnesses. In Iran, men comprise most of the workforce, and their mental health and anxiety is an important factor for improving work quality. One of the limitations of this study was that the same type of questionnaire was not used in the studies. Other limitations include non-uniform reporting of study results and a questionnaire-based diagnosis.

5. Conclusion

Mental health is one of the most important health issues in the world. Anxiety disorders are one of the most important and common mental disorders and in most cases are associated with other comorbidities, including other mental disorders, especially depression and cardiovascular disease. This review was in full agreement with the National Mental Health Survey and reaffirmed the need for preventive measures in men.

6. Appendix

6.1. Acknowledgment

This review is a part of an ongoing mega project entitled: De-lineation of Men's Health status in Iran during 2001-2017,which is approved by Men's Health & Reproductive HealthResearch Center. The authors wish to forward their grati-tude for the principal investigator and scientific and advisorycommittee of the project for their sincere collaboration.

6.2. Conflict of interest

The authors declare that they have no competing interests.

6.3. Funding support

None.

6.4. Author's contributions

All the authors have the same contribution.

References

1. Hajebi A, Motevalian SA, Rahimi-Movaghar A, Sharifi V, Amin-Esmaeili M, Radgoodarzi R, et al. Major anxiety disorders in Iran: prevalence, sociodemographic correlates and service utilization. BMC Psychiatry. 2018;18(1):261.

2. Noorbala AA, Faghihzadeh S, Kamali K, Bagheri Yazdi SA, Hajebi A, Mousavi MT, et al. Mental Health Survey of the Iranian Adult Population in 2015. Arch Iran Med. 2017;20(3):0-.

3. Saneei P, Esmaillzadeh A, Keshteli AH, Reza Roohafza H, Afshar H, Feizi A, et al. Combined Healthy Lifestyle Is Inversely Associated with Psychological Disorders among Adults. PLoS One. 2016;11(1):e0146888-e.

4. Alizadeh Z, Feizi A, Rejali M, Afshar H, Keshteli AH, Adibi P. The predictive value of personality traits for psychological problems (stress, anxiety, and depression): Results from a large population-based study. Journal of epidemiology and global health. 2018;8(3-4):124.

5. Saneei P, Hajishafiee M, Keshteli AH, Afshar H, Esmaillzadeh A, Adibi P. Adherence to Alternative Healthy Eating Index in relation to depression and anxiety in Iranian adults. British Journal of Nutrition. 2016;116(2):335-42.

6. Farahangiz S, Mohebpour F, Salehi A. Assessment of mental health among Iranian medical students: a cross-sectional study. International journal of health sciences. 2016;10(1):49.

7. Sadeghi O, Hassanzadeh-Keshteli A, Afshar H, Esmaillzadeh A, Adibi P. The association of whole and refined grains consumption with psychological disorders among Iranian adults. European journal of nutrition. 2019;58(1):211-25.

8. Hakiminya B, Parnian L. Examining the Relation between Life Style and General Mental Health. Journal of Humanities Insights. 2018;02(02):60-6.
9. Lo CK-L, Mertz D, Loeb M. Newcastle-Ottawa Scale: comparing reviewers' to authors' assessments. BMC medical research methodology. 2014;14(1):1-5.
10. Emdin CA, Odutayo A, Wong CX, Tran J, Hsiao AJ, Hunn BH. Meta-analysis of anxiety as a risk factor for cardiovascular disease. The American journal of cardiology. 2016;118(4):511-9.
11. Larijani TT, Aghajani M, Baheiraei A, Neiestanak NS. Relation of assertiveness and anxiety among Iranian University students. J Psychiatr Ment Health Nurs. 2010;17(10):893-9.
12. Hajebi A, Motevalian SA, Rahimi-Movaghar A, Sharifi V, Amin-Esmaeili M, Radgoodarzi R, et al. Major anxiety disorders in Iran: prevalence, sociodemographic correlates and service utilization. BMC psychiatry. 2018;18(1):1-8.
13. Noorbala AA, Faghihzadeh S, Kamali K, Yazdi SAB, Hajebi A, Mousavi MT, et al. Mental health survey of the Iranian adult population in 2015. Archives of Iranian medicine. 2017;20(3):128-34.
14. Saneei P, Esmaillzadeh A, Hassanzadeh Keshteli A, Reza Roohafza H, Afshar H, Feizi A, et al. Combined healthy lifestyle is inversely associated with psychological disorders among adults. PloS one. 2016;11(1):e0146888.
15. Sharifi V, Amin-Esmaeili M, Hajebi A, Motevalian A, Radgoodarzi R, Hefazi M, et al. Twelve-month prevalence and correlates of psychiatric disorders in Iran: the Iranian Mental Health Survey, 2011. Archives of Iranian medicine. 2015;18(2):76-84.
16. Bakhtiyari M, Ehrampoush E, Enayati N, Joodi G, Sadr S, Delpisheh A, et al. Anxiety as a consequence of modern dietary pattern in adults in Tehran—Iran. Eating behaviors. 2013;14(2):107-12.
17. Narimani M, Sadeghieh Ahari S, Abdi R. Epidemiological survey of mental disorders in urban regions of Ardabil province (Iran). Journal of psychiatric and mental health nursing. 2011;18(4):368-73.
18. Larijani T, Aghajani M, Baheiraei A, Neiestanak N. Relation of assertiveness and anxiety among Iranian University students. Journal of psychiatric and mental health nursing. 2010;17(10):893-9.
19. Sepehrmanesh Z, Ahmadvand A, Akasheh G, Saei R. Prevalence of psychiatric disorders and related factors in male prisoners. Iranian Red Crescent medical journal. 2014;16(1):e15205-e.
20. Ahmadi J, Amiri A, Ghanizadeh A, Khademalhosseini M, Khademalhosseini Z, Gholami Z, et al. Prevalence of addiction to the internet, computer games, DVD, and video and its relationship to anxiety and depression in a sample of Iranian high school students. Iranian journal of psychiatry and behavioral sciences. 2014;8(2):75.
21. Moghanibashi-Mansourieh A. Assessing the anxiety level of Iranian general population during COVID-19 outbreak. Asian journal of psychiatry. 2020;51:102076.
22. Hassannia L, Taghizadeh F, Moosazadeh M, Zarghami M, Taghizadeh H, Dooki AF, et al. Anxiety and Depression in Health Workers and General Population During COVID-19 in IRAN: A Cross-Sectional Study. Neuropsychopharmacology Reports. 2021;41(1):40-9.
23. Javadi M, Jourabchi Z, Shafikhani AA, Tajik E. Prevalence of depression and anxiety and their association with body mass index among high school students in Qazvin, Iran, 2013–2014. Electronic physician. 2017;9(6):4655.
24. Mohammadi MR, Salehi M, Khaleghi A, Hooshyari Z, Mostafavi SA, Ahmadi N, et al. Social anxiety disorder among children and adolescents: A nationwide survey of prevalence, socio-demographic characteristics, risk factors and co-morbidities. Journal of affective disorders. 2020;263:450-7.
25. Khesht-Masjedi MF, Shokrgozar S, Abdollahi E, Habibi B, Asghari T, Ofoghi RS, et al. The relationship between gender, age, anxiety, depression, and academic achievement among teenagers. Journal of family medicine and primary care. 2019;8(3):799.
26. Asadi-Melerdi S, Rajabi-Shamli E, Sheikhhoseini R, Piri H. Association of Upper Quarter Posture with Depression, Anxiety, and Level of Physical Activity in Sixth Grade Elementary School Students of Karaj City, Iran. International Journal of School Health. 2020;7(1):48-55.
27. Anjom-Shoae J, Sadeghi O, Keshteli AH, Afshar H, Esmaillzadeh A, Adibi P. Legume and nut consumption in relation to depression, anxiety and psychological distress in Iranian adults. Eur J Nutr. 2020;59(8):3635-45.
28. Dodangi N, Habibi Ashtiani N, Valadbeigi B. Prevalence of DSM-IV TR Psychiatric Disorders in Children and Adolescents of Paveh, a Western City of Iran. Iranian Red Crescent medical journal. 2014;16(7):e16743-e.
29. Akbari H, Sarrafzadegan N, Aria H, Garaei AG, Zakeri H. Anxiety but not depression is associated with metabolic syndrome: The Isfahan Healthy Heart Program. Journal of research in medical sciences: the official journal of Isfahan University of Medical Sciences. 2017;22:90.
30. Najafipour H, Banivaheb G, Sabahi A, Shadkam M, Mirzazadeh A. Trends in the Prevalence and Incidence of Anxiety and Depression in Adult Population in Iran: Findings from Kerman Coronary Artery Diseases Risk factors Study (KERCADRS). 2020.
31. Afshar H, Roohafza H, Sadeghi M, Saadaty A, Salehi M, Motamedi M, et al. Positive and negative perfectionism and their relationship with anxiety and depression in Iranian school students. Journal of research in medical sciences: the official journal of Isfahan University of Medical

Sciences. 2011;16(1):79.
32. Ahmadi A, Mohammadi-Sartang M, Nooraliee P, Veisi M, Rasouli J. Prevalence of anxiety and it's relationship with consumption of snacks in high school students in Shiraz. Journal of Shahrekord Uuniversity of Medical Sciences. 2013;15(1):83-90.

Table 1: Summary of articles in the meta-analysis

author's name	year of publication	study location	Total sample size	sample size for men	questionnaires	cases	age range for men	Prevalence (%)	(95%CI)
Hajebi (12)	2018	IRAN	7886	3387	CIDI and Interview	406	15-64	12	10.6-13.4
Noorbala (13)	2017	IRAN	36000	17837	GHQ-28	3439	15 and above	19.28	18.71-19.87
Saneei (5)	2016	Esfahan	3363	1403	HADS and GHQ	152	adults	10.8	9.25-12.58
Sadeghi(7)	2017	Esfahan	3172	1398	HADS and GHQ	118	18–55	8.4	7.04-10.02
Saneei(14)	2016	Esfahan	3363	1403	HADS	152	adults	10.8	9.26-15.58
Alizadeh(4)	2017	Esfahan	4763	2105	HADSand GHQ	211	adults	10	8.77-11.39
Sharifi (15)	2015	IRAN	7886	3387	CIDI; and Interview	407	15–64	12	10.60-13.40
Bakhtiyari(16)	2013	tehran	1782	816	Speilburger	test	45	18-35 5.4	4.05-7.31
Narimani(17)	2011	ardabil	1430	700	GHQ	148	15–65	21.1	18.17-24.36
Larijani (18)	2010	tehran	250	68	Spielberger test	34	18-24	50	37.62-62.38
Sepehrmanesh (19)	2014	Kashan prisoners	180	180	SCL-90-R and Interview	24	15-50	13	8.73-19.19
Ahmadi(20)	2014	shiraz	1020	510	Interview	8	16.2	1.4	0.68-3.07
Moghanibashi-Mansourieha(21)	2020	nationwide	10754	3681	the anxiety of the dass21 questionnaire	593	65% of participants were 21-40 y	16.1	14.94-17.34
Hassannia(22)	2020	nationwide	2045	671	HADS	157	44.07 ± 11.638 (20-60 y)	23.4	20.24-26.79
Javadi(23)	2017	Qazvin	1040	541	Beck	69	16.51±1.09	12.8	10.06-15.86
Mohammadi(24)	2019	Nationwide	29878	14626	K-SADS-PL and interview	263	6-18 y	1.8	1.60-2.10
Khesht-Masjedi(25)	2019	Guilan	666	348	Beck	41	16.78 ± 1.07 (13-19 y)	11.6	8.59-15.64
Asadi-Melerdi (26)	2020	Karaj	346	346	RCMAS	16	11.51±0.5 (11-12)y	4.4	2.67-7.36
Anjom Shoae(27)	2020	Isfahan	3172	1398	HADS and GHQ	120	18-55 y	8.6	7.17-7.40
Dodangi(28)	2014	Paveh	379	200	K-SADS-PL interview	16	12.42 ± 3.57 (6-18 y)	8.2	4.64-12.67
Akbari(29)	2017	Isfahan	470	236	HADS	70	57.45 ± 8.42	29.8	23.91-35.93
Najafipour(30)	2020	Kerman	9996	4058	Beck and interview	373	46.2 ±15.7 in both sexes	9.2	8.32-10.12
Afshar(31)	2011	isfahan	793	394	Revised Children's Manifest Anxiety Scale	51	14.9 ± 1.55	12.9	9.79-16.67
Ahmadi (32)	2013	shiraz	410	208	Beck	93	16-17y	44.7	37.83-51.74

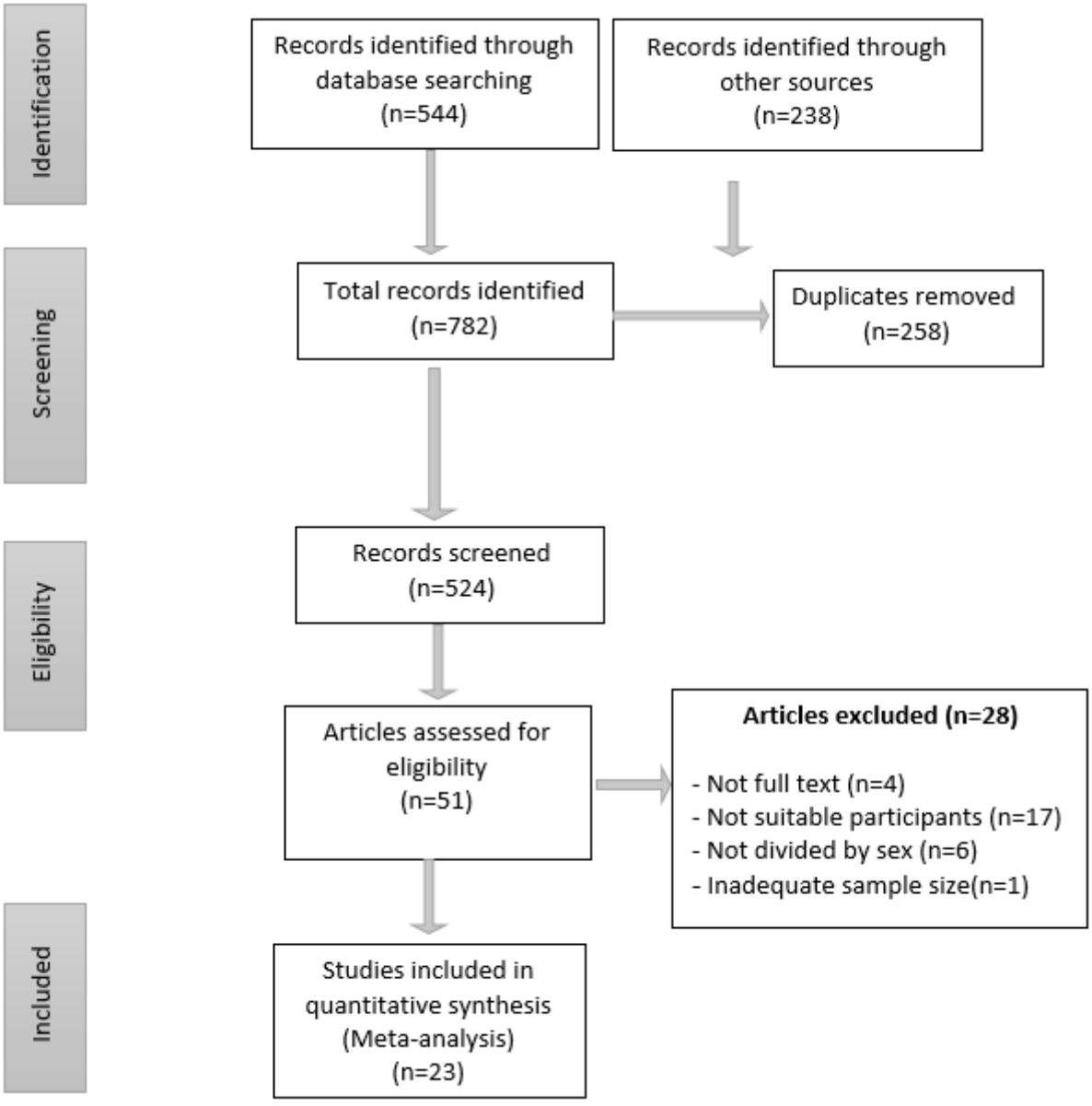

Figure 1: PRISMA flow chart of the selection process.

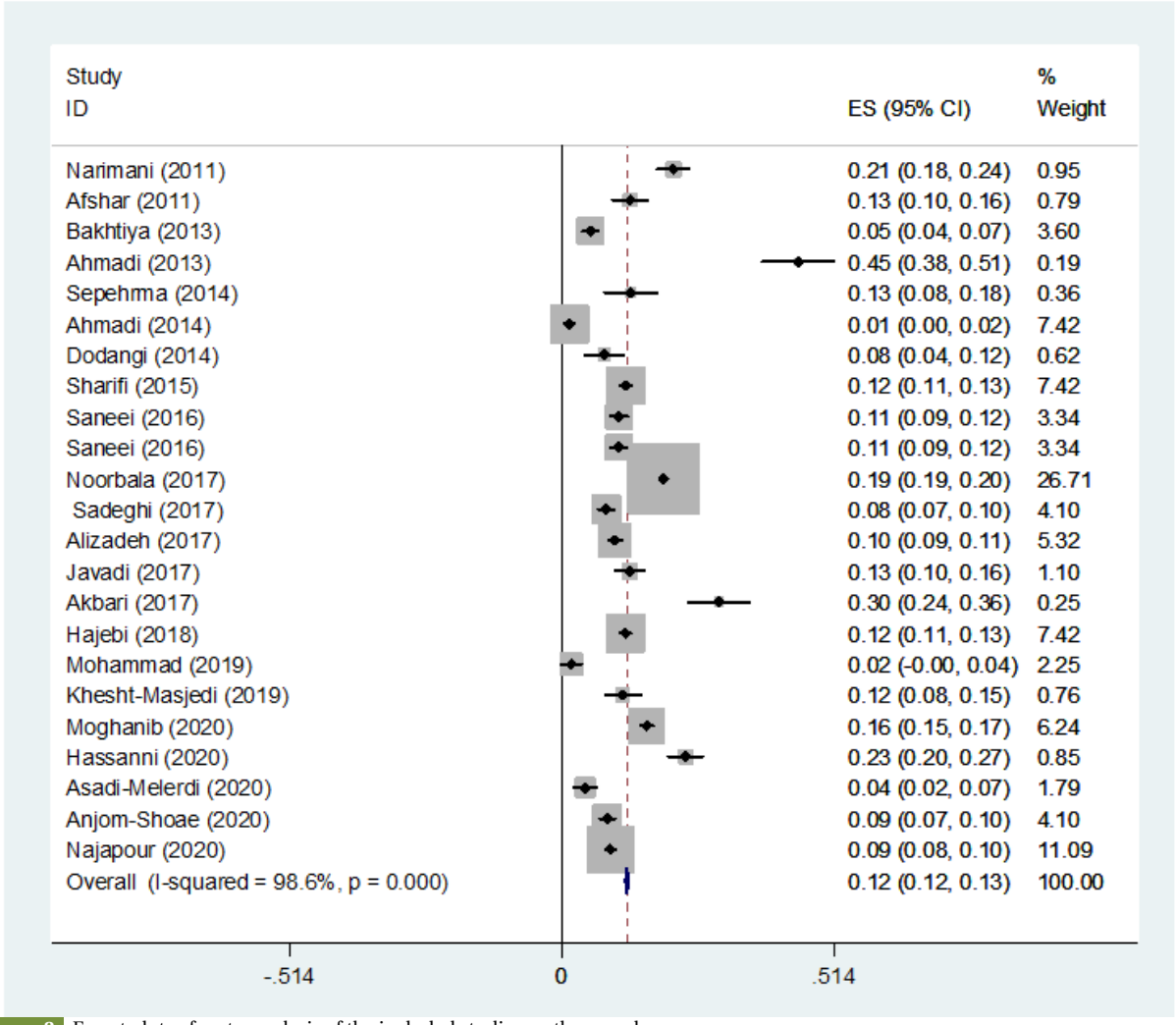

Figure 2: Forest plots of meta-analysis of the included studies on the prevalence.