



Prevalence of Depression in Women with Polycystic Ovary Syndrome in Iran: A systematic Review and Meta-analysis

Zahra Shahraki^{*1}

¹Faculty of Medicine, Zabol University of Medical Sciences, Zabol, Iran

E-mail: thn.search@gmail.com

Abstract

Introduction: The prevalence of depression is an average of 7.7% of 15-year old and older population in Iran, and nearly 10-15% of them commit suicide. In Iran, the risk of depression in women is twice that of men; i.e. 9.1% vs. 4.5%. Depression affects whole organisms and all areas of one's life. Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorder in women of reproductive age. The present study was conducted to accurately determine the general prevalence of depression in patients with polycystic ovary.

Methods: the methods used for this systematic review were based on the "Cochrane Systematic Study Booklet" and "Appropriate Items for Systematic and Meta-Analysis Study (PRISMA)" tool. Observational studies conducted on general population have been added and studies conducted on specific population have been removed. Results are summarized as reported in the research. The minimum sample size was 25 patients in each study.

Results: The final research was conducted on 364 participants; with an age range of 15 and 80 years old; a cross-sectional design was used in all studies. Research was conducted in only 2 provinces out of 31 provinces of Iran. Meta-analysis prevalence of Depression in women with Polycystic Ovary Syndrome Based on the results of random effects model, the incidence of Depression in women with Polycystic Ovary Syndrome in 364 patients was 32.2% (95% confidence interval [CI]: 27.5, 36.9, $I^2 = 75.4$).

Conclusion: The results of the present systematic and meta-analysis showed high prevalence of depression in patients with polycystic ovary syndrome in Iran, a fact that further substantiates the importance of the subject and the necessity of the attention of the authorities to controlling the disease. The high rate of prevalence of depression and the continuation of new cases in this population indicates that the initial assessment of all women with PCOS should include the assessment of mental disorders.

Keywords: Polycystic ovary syndrome, Beck 2 Depression questionnaire, Depression.

Introduction

Nowadays, the mechanical life has increased the potential of mental illness and emotional distress for all people; nobody is safe against psychosocial pressures and psychological disorders, such as depression (1). The prevalence of depression is an average of 7.7% of 15-year old and older population in Iran (2), and nearly 10-15% of them commit suicide (3). In Iran, the risk of depression in women is twice

that of men; i.e. 9.1% vs. 4.5%. Depression affects whole organisms and all areas of one's life. Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorder in women of reproductive age (5). The incidence rate of this disease has been reported differently, between 6 to 10%, in various researches (6). The main symptoms include disorder of both endocrine and gynecologic systems in the form of oligo-amenorrhea, Hirsutism, obesity, acne and reproductive disorders. Polycystic ovary syndrome is

associated with many complications in different stages of one's life; due to high prevalence and various complications of this syndrome, including ovarian and menstrual disorders, infertility, hirsutism, metabolic disorders, endometrial hyperplasia, endometrial cancer, breast cancer and venous thromboembolism (7), it imposes huge burden on the health system of the country and has serious consequences on the psychological and quality of life of the patients. Many biochemical, hormonal and metabolic factors, such as infertility, changes in the appearance of the person and especially obesity and hair loss, acne, changes in behaviors, sexual satisfaction and sexual function, occur in the domain of mental health of people with this syndrome (8). Women with PCOS have a lower quality of life than those with other chronic diseases such as asthma, epilepsy, diabetes and back pain (9). Women make up half the population in Iran and the mean life expectancy of them is rising like women in other countries. Iran is a vast country in which there are many ethnic groups living in different cultures. Thus, the prevalence of depression in different parts of the country will be different. In addition, given that these individuals are young women who live in an active phase of life and depression can affect their various aspects of life, the present study was conducted to accurately determine the general prevalence of depression in patients with polycystic ovary.

Methods:

Eligibility criteria

the methods used for this systematic review were based on the "Cochrane Systematic Study Booklet" and "Appropriate Items for Systematic and Meta-Analysis Study (PRISMA)" tool. Observational studies conducted on general population have been added and studies conducted on specific population have been removed. Results are summarized as reported in the research. The minimum sample size was 25 patients in each study. The target population covers the total population of Depression in women with Polycystic Ovary Syndrome in Iran who entered the study. The prevalence of Depression in women with Polycystic Ovary Syndrome was calculated in this study.

Searching strategies and databases

The review of references and resources was done using the Medical Subject Headings (MeSH) and

keywords related to the source of information on the incidence of general prevalence of depression in patients with polycystic ovary. To find references, the international Databases (MEDLINE PubMed interface), Google Scholar, and Web of Science) and domestic databases (SIDs and Migiran) and journals were searched; unlimited searching, in terms of both setting and language, was done until June 30, 2018. PRESS standard and the Health Sciences Librarian were used for designing the strategy.

MEDLINE application was used to search other databases. In addition, PROSPERO was used to provide a systematic search that was completed recently. To search for headlines and abstracts, boolean (AND, OR, NOT), mesh, coordinate {truncation} * and related words were used; following keywords were used to provide a comprehensive context: Polycystic ovary syndrome, Beck 2 Depression questionnaire, Depression, and prevalence rate and percent.

Research selection and data extraction

According to the research protocol, two researchers observed the titles and abstracts separately according to the eligibility criteria; in the next step, after the removal of repeated studies, the full text of the paper was studied based on the eligibility criteria and the required information was extracted. Consensus method was used to solve the disagreements between two researchers. The extracted data included the general information (corresponding author, year and place), characteristics of the research (research design, sample size, location, study period, and risk of bias), and characteristics of participants.

Quality control

To assess the quality of the methodology and bias risk, each observation study was evaluated using a tool developed by Hoy et al; this 10-item scale evaluated the quality of the study in two dimensions, including external credentials (items 1 to 4 target populations, sampling frame, sampling method, and minimum indirect neglect) and internal validity (items 5 up to 9 covering methods for data collection, case definition, study tools, and data collection mode and item 10 covering assessing relevant assumptions or analyzes). The risk of abuse was assessed by two researchers separately and possible disparity of ideas was resolved by consensus.

Aggregation of data

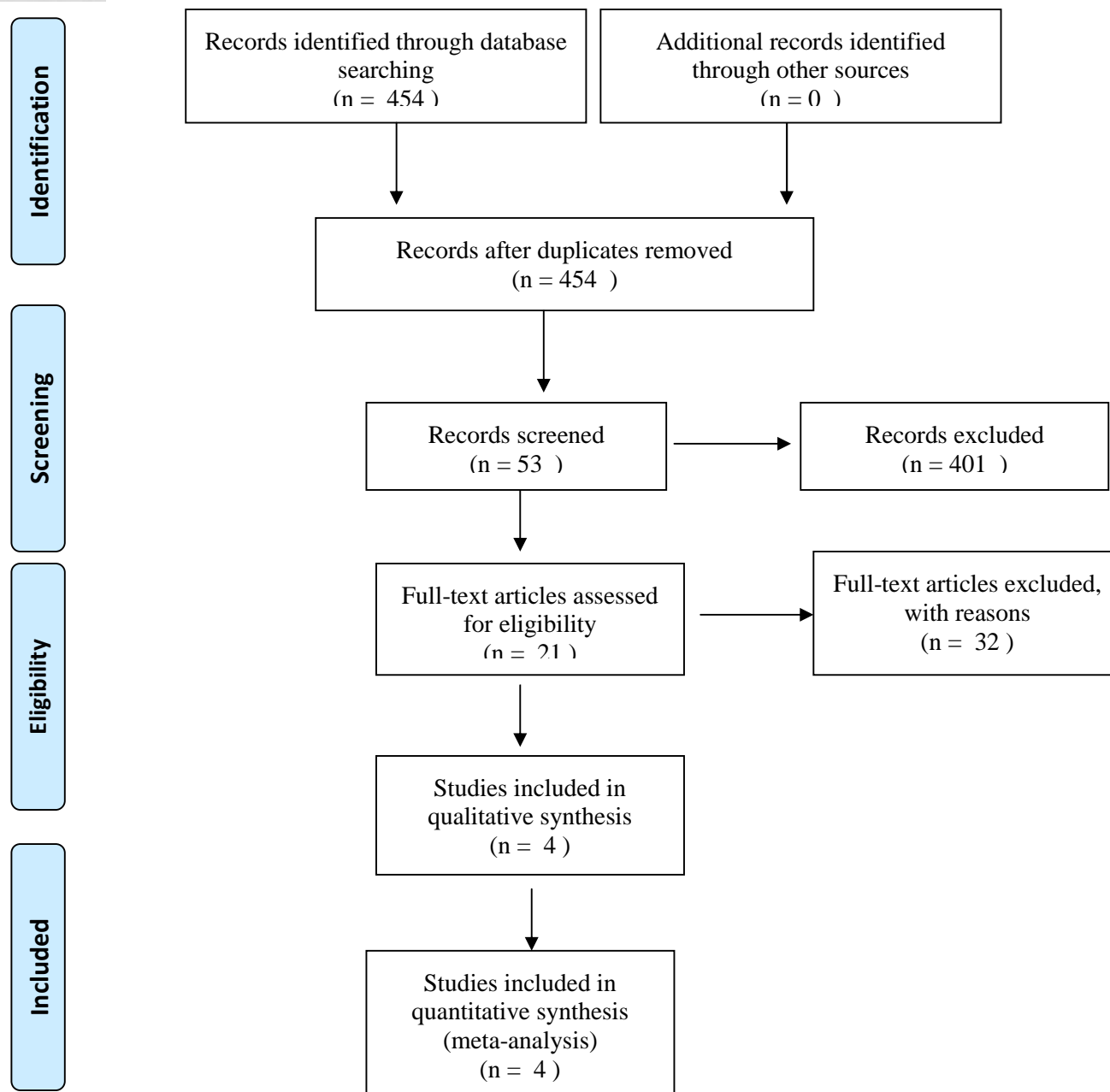
All eligible studies were included within the systematic review. The heterogeneity of primary studies was assessed by performing I^2 tests. Subgroup analysis was conducted to determine the heterogeneity based on the participants in the study, gender, and age. Meta-analysis was performed using the STAT 14 statistical software.

Results

1. Selecting eligible papers and researches

In the initial search on various databases, a total of 454 articles were reviewed, 401 of which turned out to be repetitive during screening process of title and abstract. 32 articles were removed due to unrelated title; out of the remaining 21 articles, 4 articles met the inclusion criteria. Of the 17 articles that were removed, 3 were reviews, 1 were letters to editors, 2 had no complete text, and 11 had low quality and could not be considered in the research. (Figure 1)

PRISMA 2009 Flow Diagram



2. Characteristics of the researches and papers

The final research was conducted on 364 participants; with an age range of 15 and 80 years old; a cross-sectional design was used in all studies. Research was conducted in only 2 provinces out of 31 provinces of

Iran. Of the 4 studies, 3 were from Tehran [12-14] and one from Hamadan [17, 18; the majority of papers were conducted on outpatient cases ($n = 3$) through random sampling ($n = 5$). Required data was collected through interview ($n = 3$) and had a low bias risk ($n = 3$) (Table 1).

Table 1: Characteristics of final included studies about prevalence of Depression in women with Polycystic Ovary Syndrome in Iran

ID	Author	Year	N	Type of study	prevalence	Bias
1	Arshad ^[10]	2011	71	Cross-sectional	0.32/4	Low
2	Salehi ^[13]	2016	73	Cross-sectional	0.21	Moderate
3	Ardekani ^[14]	2010	100	Cross-sectional	0.45	Low
4	Rahiminejad ^[15]	2014	120	Cross-sectional	0.31/7	low

Meta-analysis prevalence of Depression in women with Polycystic Ovary Syndrome Based on the results of random effects model, the incidence of Depression in women with Polycystic Ovary Syndrome in 364

patients was 32.2% (95% confidence interval [CI]: 27.5, 36.9, $I^2 = 75.4$); subgroups analysis was conducted to determine gender heterogeneity according to the type of participants, sex and age.

Table 2: prevalence of Depression in women with Polycystic Ovary Syndrome

Study	year	ES	95% conf Interval		weight
			up	Low	
Arshad	2011	0.324	0.433	0.215	18.80
Salehi	2016	0.210	0.303	0.117	25.55
Ardekani	2010	0.45	0.547	0.353	23.44
Rahiminejad	2014	0.317	0.400	0.234	32.21
Overall random pooled ES	-----	0.322	0.369	0.275	100

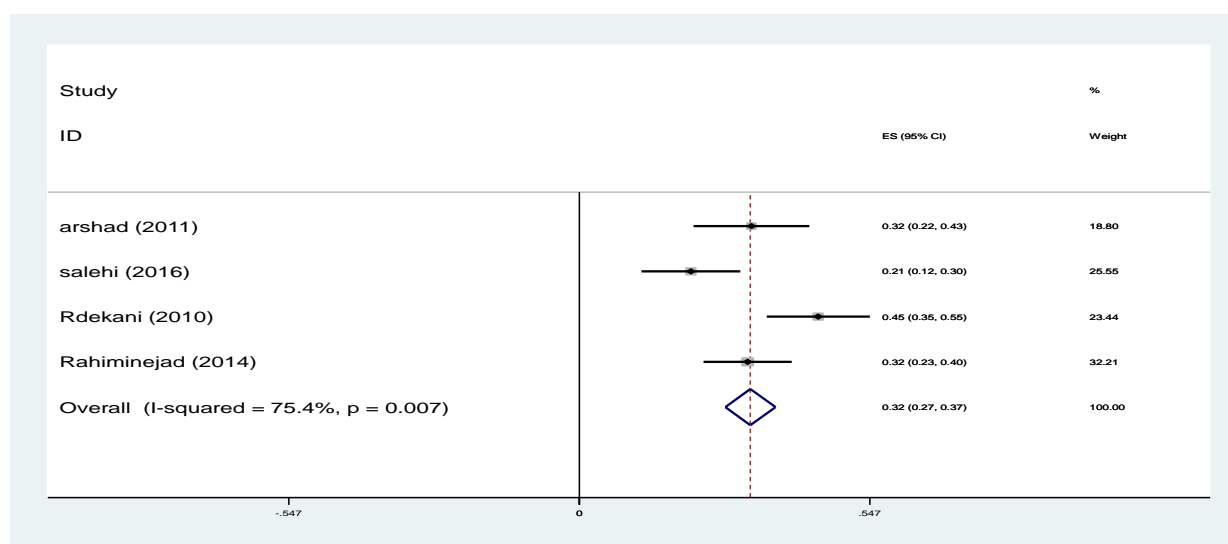


Fig.2 . The incidence of Depression in women with Polycystic Ovary Syndrome and its 95% interval for the studied cases according to the year and the city where the study was conducted based on the model of the random effects model. The midpoint of each section of the line estimates the % value and the length of the lines showing the 95% confidence interval in each study.

Discussion

The findings of this study showed that depressed mood among patients with PCOS is more common than normal population. The present study was the first systematic and meta-analytic review in Iran that showed depression in women with polycystic ovary syndrome in all age groups. This disease is present in a large group of women in different societies with high prevalence and most clinical manifestations occur during adolescent and middle aged years. Polycystic ovarian syndrome is a chronic disease, usually accompanied with clinical symptoms and complications, including hirsutism, acne, obesity and infertility, each of which can cause huge stress in the lives of patients, leading to anxiety, depression and reducing the quality of life (10). Aditi P. Chaudhari et al., estimated the prevalence of depression in patients with polycystic ovary and the rate turned out to be 25.7% in India (11); while Angela Kerchner B.A et al in a study in the United States reported a 40% outbreak of depression in patients with polycystic ovary (12).

The result of the analysis of 6 studies conducted on 774 subjects was scrutinized in the present study. The overall prevalence of depression in patients with polycystic ovary syndrome in Iran was 16.2%, which is the result of a comprehensive review of available evidence (Iran is a country in the Middle East with a population of more than 80 million people). The prevalence of depression in patients with polycystic ovary syndrome was very different and heterogeneous in different provinces. The prevalence of depression in patients with polycystic ovary syndrome in Iran was lower than some countries such as India and the United States (2 and 3). The results of the present study did not reveal any significant bias, because the search bias was minimized through extensive research using various databases in our statistical analysis.

Conclusion

The results of the present systematic and meta-analysis showed high prevalence of depression in patients with polycystic ovary syndrome in Iran, a fact that further substantiates the importance of the subject and the necessity of the attention of the authorities to controlling the disease. The high rate of prevalence of depression and the continuation of new cases in this population indicates that the initial assessment of all women with PCOS should include the assessment of mental disorders.

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