Research Article

Prevalence of depression after myocardial infarction in Iranian patients: A systematic review and meta-analysis

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Abstract

Introduction:

Myocardial infarction has been the leading cause of death and its prevalence in some parts of the world, which has a profound effect on health-related quality of life, and more, it has been identified in people who have had a depressive experience after a myocardial infarction. The aim of this study was evaluated the Prevalence of depression after myocardial infarction in Iranian patients.

Methods:

The methods used in this systematic review were based on the Checklist (PRISMA) Guidelines. In this research, cross-sectional, case-control, and cohort studies were included and case studies, letters to editors, case reports, clinical trials, study protocols, systematic reviews and narrative reviews were excluded. The searches were conducted by two independent researchers and the aim was to find the relevant studies published from 1/1/2009 to 30/5/2019.

Results:

According to the random effect model, the total prevalence of depression in 499 patients after myocardial infarction was 55% (51%-59% at a 95% confidence interval, $I^2 = 96.1\%$).

Conclusion:

Attention to depression in studies of risk factors for coronary artery disease is of great importance, and on the other hand, depression is a major risk factor for developing coronary artery disease.

Keywords: Depression; Death-psychology; Myocardial infarction

Introduction

Myocardial infarction has been the leading cause of death and its prevalence in some parts of the world, which has a profound effect on health-related quality of life, and more, it has been identified in people who have had a depressive experience after a myocardial infarction (1-3). On the other hand, depressive disorder increases the risk of re-hospitalization, which in turn has an impact on the quality of life of these patients (4). In addition, other reports suggest lower quality of life following a myocardial infarction in survivors of myocardial infarction. Although the diagnosis of myocardial infarction affects the different physical, psychological and social dimensions of patients' lives, the diagnosis of depression, more than the severity of coronary heart disease, predicts the quality of life and health of these patients (5).On the other hand, the physical and psychological consequences of ischemic heart disease are related to significant impairment in all aspects of quality of life, both physically and psychologically (6).Physical and mental disorders in patients with MI can in many cases have lasting detrimental effects on their style of life following a myocardial infarction (7). As a result, their quality of life decreases over the long term(8) .In this regard, the results of studies have shown that patients, after a myocardial infarction, in their daily lives, homework, physical activities, such as climbing stairs, etc. are disabled and their level of performance compared to the time before diagnosis has declined, and low moods have been reported (9).On the other hand, the risk of death for these patientsand the possibility of restrictions on their activity, can delay recovery, maintain depression and increase the risk of other health problems and ultimately cause a poor quality of life (10).Therefore, until evidence suggests that treatment for depression can reduce the risk of prevalence of cardiac death,treatment for depression should be continued to improve the quality of life of these patients.

Methods

Inclusion Criteria (Eligibility Criteria):

The methods used in this systematic review were based on the Checklist (PRISMA) Guidelines.In this research, cross-sectional, case-control, and cohort studies were included and case studies, letters to editors, case reports, clinical trials, study protocols, systematic reviews and narrative reviews were excluded.

Findings: The main purpose of this study was to determine the prevalence of depression in patients with myocardial infarction and the findings were reported.

Sampling Methods and Sample Size: All observational studies were included in the systematic review regardless of their design. The minimum sample size was 25 patients or more.

Search Strategy:

The searches were conducted by two independent researchers and the aim was to find the relevant studies published from 1/1/2009 to 30/5/2019. The researchers searched for published studies in the English language in MEDLINE via PubMed, EMBASETM via Ovid, the Cochrane Library and Trip database. To select studies published in other languages, National Database (Magiran and SID, KoreaMed and LILACS), and for unpublished studies, OpenGrey (www.opengrey.eu/), World Health Organization Clinical Trials Registry (who.int/ictrp), and ongoing studies were searched. To ensure that the studies are adequate, the reference lists of the retrieved studies were also searched and studied. Specific search strategies were performed using the Health Science Librarian website, which searches systematic review articles using MESH and open terms in accordance with publication standards.

After the MEDLINE strategy was finalized, the results were compared in order to search for other databases, as well as PROSPERO was searched for recent or ongoing systematic reviews. The keywords used in the search strategy are:Depression; Death-psychology; Myocardial infarction

Study Selection and Data Extraction

The two researchers independently analyzed the titles and abstracts of the articles according to the eligibility criteria. After excluding additional studies, the full text of each study was evaluated on the basis of the eligibility criteria and the information about the authors was collected as needed. The general information (the first author, country in which the study was conducted and year of publication), study information (the sampling technique, diagnostic criteria, data collection method, research conditions, the sample size, and risk of bias) and output scale (the prevalence of depression) were collected.

Quality Assessment

The extended scale of Hoy et al. was used to evaluate the quality of method and the risk of bias in each observational study. This 10-item scale assesses the quality of studies according to their external validity (items 1 to 4 evaluate the target population, sampling frame, and minimum selection bias) and internal validity (items 5 to 9 evaluate the data collection, problem statement, research scale and data collection tool, while item 10 evaluates the data analysis bias). The risk of bias was measured by two researchers independently and disagreements were resolved by consensus.

Data Collection:

All eligible studies were included in the data collection after a systematic review and the data were integrated using the cumulative chart. The random effect model was evaluated based on the overall prevalence of the disease among the participants. The heterogeneity of the initial studies was assessed using the I^2 test. In addition, subgroups were analyzed to determine the heterogeneity by participants' age, year of publication, and country. Finally, a meta-analysis was performed using STATA14 statistical software.

Results

Study Selection

A total of 245 articles were extracted through preliminary searches in various databases. Of the 245 essential studies identified by the analysis of titles and abstracts, 203ones were eliminated because of irrelevant titles. Of the 12 existing studies, 7ones were excluded. Of the 7 excluded studies, 1 had no full-text article, 3 were review articles, 1was a letter to the editor. all the remaining studies, met the inclusion criteria. (Fig. 1)
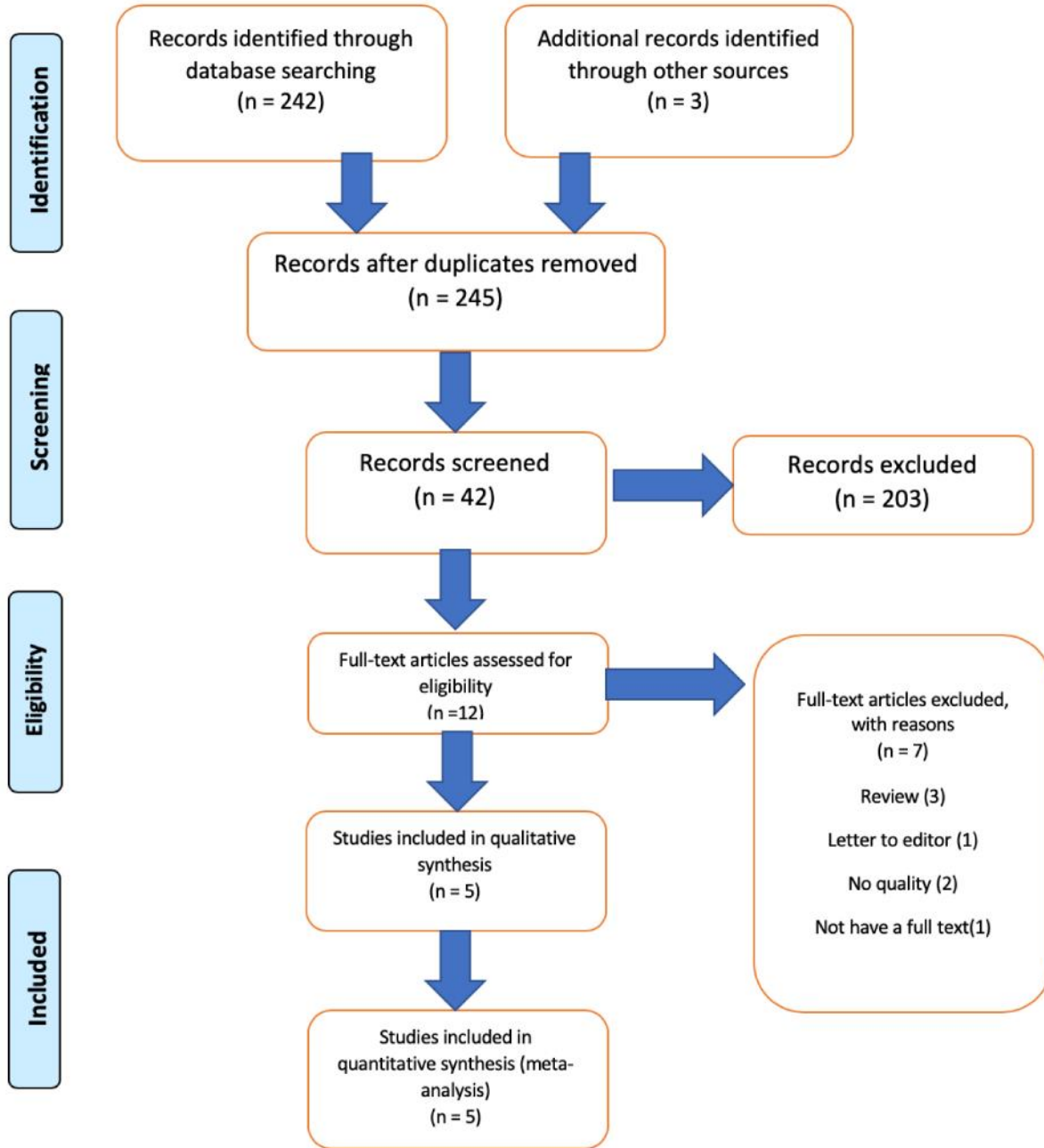
Figure 1. PRISMA flow diagram

Research Properties

A total of 499 patients who had myocardial infarctionand a total of 5 studies from 4province that met the inclusion criteria were evaluated.Simple sampling was used to select the sample (n = 5). All of studies, were retrospective.

Of these studies, 2 studies from the Isfahan, and other studies were from Rasht , Tehran and Mashhad that were included in the study. All studies the risk of bias were low. Data were originally collected from medical records. The main study sites were intensive care units (n = 5). (Table 1)

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Table 1.Demographic characteristics for the included studies

ID	Frist author	Publication year	City or province	Participants	Male to Female	Age mean	Risk of bias
1	Bagherian[21]	2010	Isfahan	100	--	55.13	Low
2	Ardani[22]	2008	Mashhad	100	36/64	59.14	Low
3	Bagherian[23]	2014	Isfahan	176	148/28	56	Low
4	Hosseini[24]	2005	Tehran	15	--	--	Low
5	Shokrgozar[25]	2014	Rasht	108	72/36	59.8	Low

The meta-analysis of the Prevalence of depression after myocardial infarction:

According to the random effect model, the total prevalence of depression in 499 patients after myocardial infarctionwas 55% (51%-59% at a 95% confidence interval, I^2 = 96.1%). (Fig. 2, Table 2)

Table 2.The meta-analysis of the Prevalence of depression after myocardial infarction

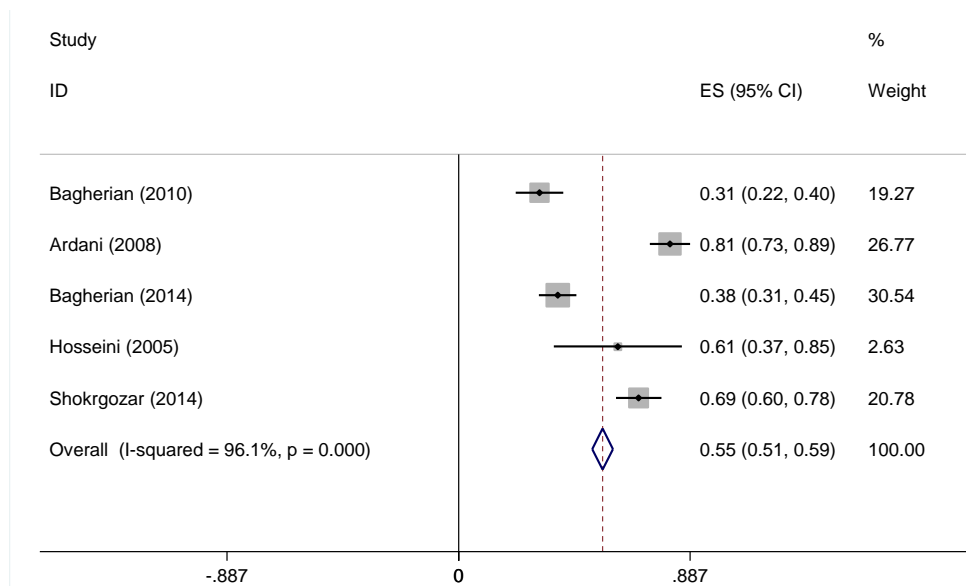| Firs Author	95% conf. interval (Allergic)				Publication year	Participants
	Down	Up	ES	Weight	------	-------
Bagherian	0.21	0.40	0.31	19.27	2010	100
Ardani	0.73	0.89	0.81	26.77	2008	100
Bagherian	0.31	0.45	0.38	30.54	2014	176
Hosseini	0.36	0.85	0.61	2.67	2005	15
Shokrgozar	0.60	0.78	0.69	20.78	2014	108

Figure 2. The meta-analysis of the Prevalence of depression after myocardial infarctiont and its 95% interval for the studied cases according to the year

Meta Regression Results

Meta-regression between the year of publication and the Prevalence of depression after myocardial infarction in Iranian patients:

The meta-regression of the studies was evaluated according to the relationship between the prevalence of depression and the year of publication and the overall rate of depression. There was no significant linear trend in the univariate meta-regression to explain the effect size of the year of publication. (Fig.3).
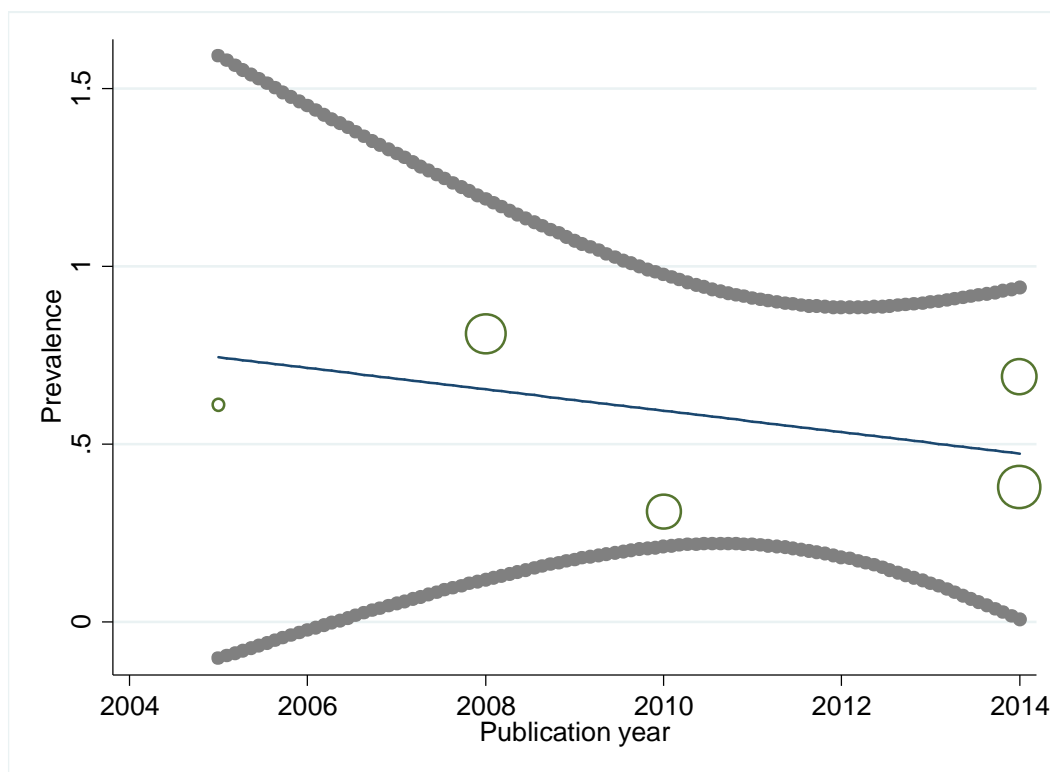

Figure 3.Meta-regression between publication year of study andthe Prevalence of depression after myocardial infarctiont

The results of meta-regression between participants' age and the Prevalence of depression after myocardial infarction in Iranian patients:

The regression of the study was evaluated by the relationship between the prevalence of depression and participants' age and the total rate of depression. There was no significant linear trend in the univariate meta-regression to explain the effect size of participants' age. (Fig. 4)
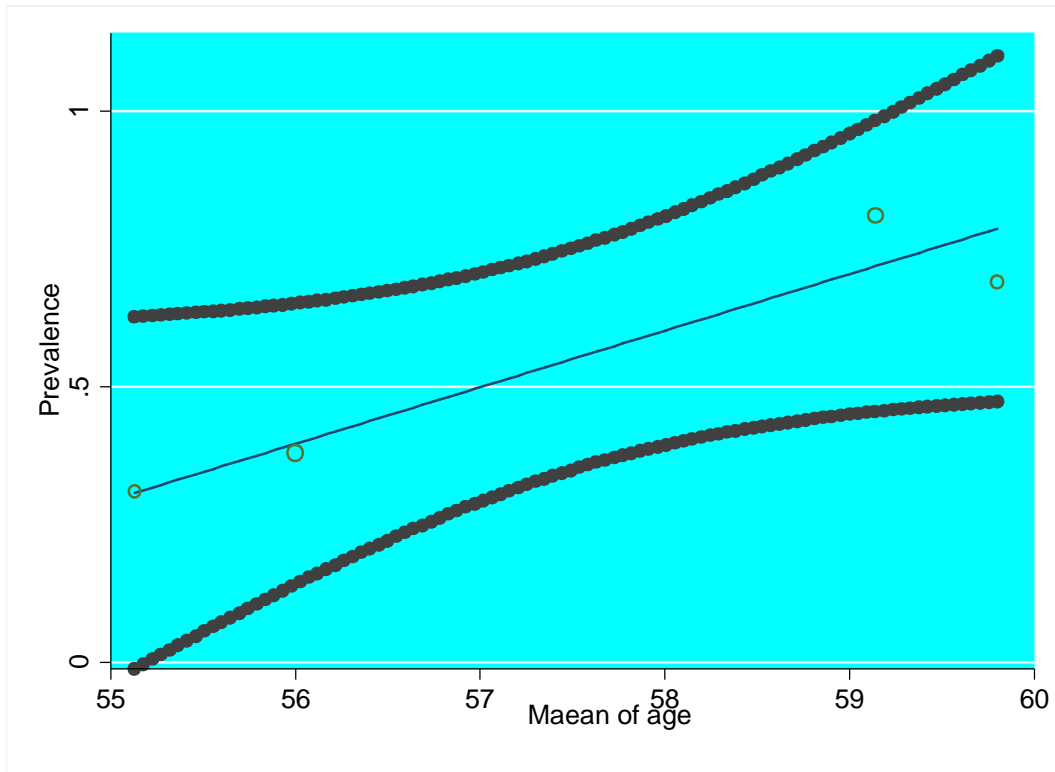
Figure 4. Meta-regression between mean of age and the Prevalence of depression after myocardial infarctiont

Publication Bias of Articles:

The funnel plot in Fig. 5 does not show a publication bias and it is symmetric. The circle size indicates the size of the studies (the larger circles indicate more samples and the smaller circles indicate fewer samples). (Fig. 5)
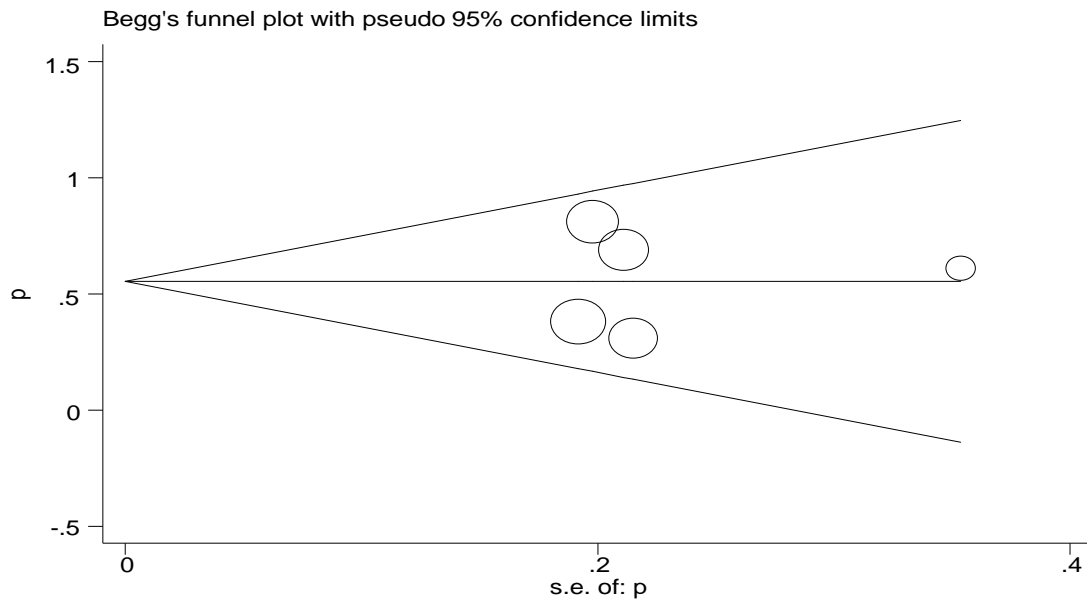

Figure 5. Funnel plot of publication bias shown in symmetrically. Circles' size shows the weight of studies (bigger circles show more samples and smaller circles show fewer samples).

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Discussion

According to the random effect model, the total prevalence of depression in 499 patients after myocardial infarction was 55% (51%-59% at a 95% confidence interval, I^2 = 96.1%). Depression is one of the most common psychological disorders,which falls into the category of mood disorders (11). Several factors have been mentioned in the pathophysiology of depression, including biological factors (physical illnesses, hormonal imbalancesand some medications) hereditary and social psychological factors.Depression is a common and debilitating condition that often occurs after a myocardial infarction (12). Although both cases have an increasing prevalence, depression related to medical illness is more prevalent (13). The role of depression in cardiovascular diseases has been increasingly emphasized, and its negative effects on patients with cardiovascular diseases have been extensively addressed in the studies (14). Depression in patients after a myocardial infarction occurs three times more than in the general population, and its presence increases the risk of cardiovascular events and mortality (15). Symptoms of depression develop in approximately 15 to 20% of patients after a myocardial infarction (16).Depression seems to be more recurrent in women than in men. Attention to depression in studies of risk factors for coronary artery disease is of great importance, and on the other hand, depression is a major risk factor for developing coronary artery disease (17). There is no doubt that depression with myocardial infarction worsens the patient's physical and mental health, thereby leaving the patient exposed to a poor quality of life, readmission, and premature death (18,19). In line with this, studies have shown a continuing association between post-MI depression and worsening of prognosis (20).Finally, it was found that depression is a strong predictor of mortality after a recent myocardial infarction. Various physiological mechanisms including increased activity and platelet adhesion, heart arrhythmia, increased catecholamine levels, and endothelial dysfunction have been implicated in the association between depression and adverse cardiac events.

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