Investigating the status of public health in Iran:
A systematic review and meta-analysis

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ABSTRACT

Public health is an aspect of the health overall concept and is one of the most important factors in human evolution and improvement which relies on methods and strategies to prevent the development of mental illness and treatment and rehabilitation for them. This study was aimed at estimating the status of public health in Iran using the meta-analysis method. The search was conducted using keywords of health, mental health, general health, GHQ-28 and Iran in international databases including Pubmed, Scopus, ISI, Google Scholar, and national databases of Sid, Med lib, Iranmedex, Magiran. Data were analyzed using meta-analysis (random effects model) by STATA Ver.11 software. Heterogeneity of studies was assessed using I^2 index. The GHQ-28 questionnaire was used in all studies. In 79 reviewed studies with a sample of 31765 people during the years 1999 to 2015, good general health in Iran was 50% (95% CI, 42%-58%), 40% of individuals had poor general health and 30% of individuals had fairly acceptable public health. Also, poor general health was 47% among women and 36% among men. A significant percentage of Iranians suffer from poor general health. Hence, noticing the state of public health and providing the basis for the realization of a dynamic and healthy life for community members seems essential.

Keywords: Health, mental health, general health, GHQ-28, Iran.

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INTRODUCTION

Health is one of the essential and constantly discussed concepts of human's complex world which has a long history. Health is a quality of life which is difficult to define and measure[1]. The World Health Organization defines health as a optimal physical, mental and social condition not merely the absence of disease[2]. The concept of mental health is an aspect of the overall health concept. World Health Organization experts define mental and thinking health as "thinking health is the ability of having harmonious relationship with others, changing and improving the personal and social environment and solving personal conflicts and interests in a reasonable, fair, and appropriate manner" [3]. Activity, movement and freshness are signs of a healthy person and mental health is required for the maintenance of individuals' social, job and educational performance in society[4]. It is obvious that maintaining mental health is as important as physical health. Perhaps, measures are taken in this regard, but mental health services are mainly allocated to small groups of people who have serious and apparent problems [5].

Paying attention to mental health is important and needs to be negotiated in all areas of life including personal, social, and career life [6]. Many experts consider the concepts of hygiene health and mental health close to each other and don not distinguish between them but some distinguish them from each other. For this reason, they believe

that hygiene health means keeping mental health, eradicating pathogens, preventing mental illness and creating fertile ground for the growth and blooming of the human personality and talents to human's maximum capacity [3]. Evidence shows that visiting psychological counseling units in universities has increased in recent years; therefore, many students need advice and guidance in this respect [7]. The health and treatment sector is one of the most important fields of health development in the communities which is directly related to human health. In this regard, hospital staffs particularly nurses are considered as a stressful occupation group [8]and [9]. Lack of information about women's health care in different situations, distribution of gender-based research and the weak relationship between science, research and management are the main problems in the development and promotion of health among individuals in society that required further studies in this area [10].

Fortunately, fruitful and successful research has been done on mental health and related topics in Iran in recent years and they have mostly used the 28-item General Health Questionnaire of Goldberg [11]. Research conducted by the World Health Organization shows that 20 percent of the Iranian population suffers from some form of mental disorder. A study in the country has declared that 21% of people aged 15 years and older in Iran suffer from some level of mental disorders [12]. Also, a recent report by the World Health Organization shows that mental disorders affect about 10 percent of adults in the society and it is estimated that about 450 million people worldwide are suffering from mental disorders [13]. Given the numerous studies in the field of public health situation in Iran and in order to validate the results of these studies, the need to perform a meta-analysis study seems necessary to provide a precise and valid estimate for planners and practitioners in the field. This study was aimed at estimating the status of public health in Iran using the systematic review and meta-analysis method. This study first did a systematic review of previous studies and next conducted meta-analysis of the final data and finally assessed the status of public health in Iran.

MATERIALS AND METHODS

Search strategy:
This is a meta-analysis study that considers finally assessed the status of public health in Iran. The reviewed documents were searched from internet and manual search in the library of Tehran University of Medical Sciences. Databases including Iranmedex, SID, Magiran, Irandoc, Medlib, IranPsych, Science Direct, ISI, PubMed, and Scopus were searched using Internet. The search was limited to **16** recent years updated to 2015 and involved theses, national and international scientific journals, papers presented at congresses and organizational reports.

To gain high sensitivity, the search inside the country was conducted only through keywords of Health, mental health, general health, GHQ-28 and Iran because some sites did not show sensitivity to the search operators (OR, AND, NOT). However, international databases were searched through the keywords of ("Health", "mental health", "general health", "GHQ-28" and "Iran"). The keywords were standard in MeSH and eventually (Iran AND general health) strategy was used to search. In addition, reference lists of selected articles were evaluated for finding relevant studies.

Study Selection:
First, a list of titles and abstracts of all searched papers in national databases was prepared by two researchers independently. Then, articles with repetitive titles were excluded. Next, articles' abstracts were reviewed for finding appropriate studies. Study selection in international databases was similar to the that of national databases, except that all search studies were saved in EndNotex6 software and the rest of the process was done by the software.

Study inclusion criteria were: (1) All descriptive studies (2) Referring to the status of general health in Iran (3) Studies conducted in the last **16** years. It should be noted that the minimum entry criteria were used to increase the sensitivity of article selection. But to find the most relevant and highest quality studies, exclusion criteria were as follows: (1) Non-related studies in terms of study method and research topic. (2) Studies which did not have enough information. The low quality of studies was assessed through the STROBE checklist (Strengthening the reporting of observational studies in epidemiology)(14). The quality of studies was evaluated using the STROBE checklist. The checklist has 22 sections that cover different parts of a report. Each section was given one point and higher points were given to other sections that we considered more important.

Data Extraction:
To reduce bias in reporting and error in data collection, two researchers independently extracted data using a standardized data collection form that was already prepared. The form was first designed by the study team and included the following items: The author's name, title of study, year of publication, city of study, journal name, average age, inclusion and exclusion criteria, sample size, optimal general health, poor general health, physical disorder, anxiety disorder, insomnia, etc.

The GHQ-28 questionnaire was used in all of the reviewed studies. Mental health is associated with GHQ test in most of the research done in and outside the country. For example, GHQ test's ability in isolating normal people and people with mental disorders has been approved in Finland in recent years (15). One of the most prestigious and widely used tools for assessing health status in adults is the 28GHQ General Health Questionnaire which was presented by Goldberg in 1978 (16). The main form the questionnaire contains 60 items that and, by necessity, shorter versions of the questionnaire were gradually designed in forms of 12, 28 and 30 items and were used in different studies(17). The questionnaire has different versions and of the 28GHQ is the widely used type and is known as a screening tool for those who are at risk of psychiatric disorders in four areas including health, depression, insomnia and anxiety (18). The questionnaire was first developed by Goldberg and Hillier in 1972 and was used to detect minor disorders (19). Physical symptoms in the general health questionnaire represent and individual's risk of physical illness (20). In our country, Ashouri et al (2004) use a cut-off point in order to separate people into two categories of ordinary people and those with non-psychotic mental disorders and reported a cut-off point of 23. Namely, those whose score was less than 23 were in the group of people with mental health and those whose score was higher than 23 were in the group that did not have a good mental health. This test has been translated into 36 languages and many researchers have declared using it (21).

Statistical Analysis:
I square (I^2) was used in order to analyze and combine studies with regard to the type of data to calculate the dissimilarity index. Due to significant heterogeneity between studies (P= 000/0), random-effects model meta-analysis was used to combine different studies. Data were entered into the STATA Ver. 11 software. Also in this meta-analysis, meta-regression was used for additional analysis which assessed the significance of the relationship between the prevalence of mental health in Iran in terms of sample size and year of study.

RESULTS

Inclusion method summary of studies to the meta-analysis
In the first phase of the search, 108 articles were selected and after reviewing the titles 12 duplicate and overlapping articles were excluded. Abstracts of 96 possibly relevant articles were reviewed and 7 other unrelated articles were identified and excluded. The full-text of the remaining 89 were article were reviewed and finally 79 articles were accepted for inclusion in the meta-analysis (Figure 1).
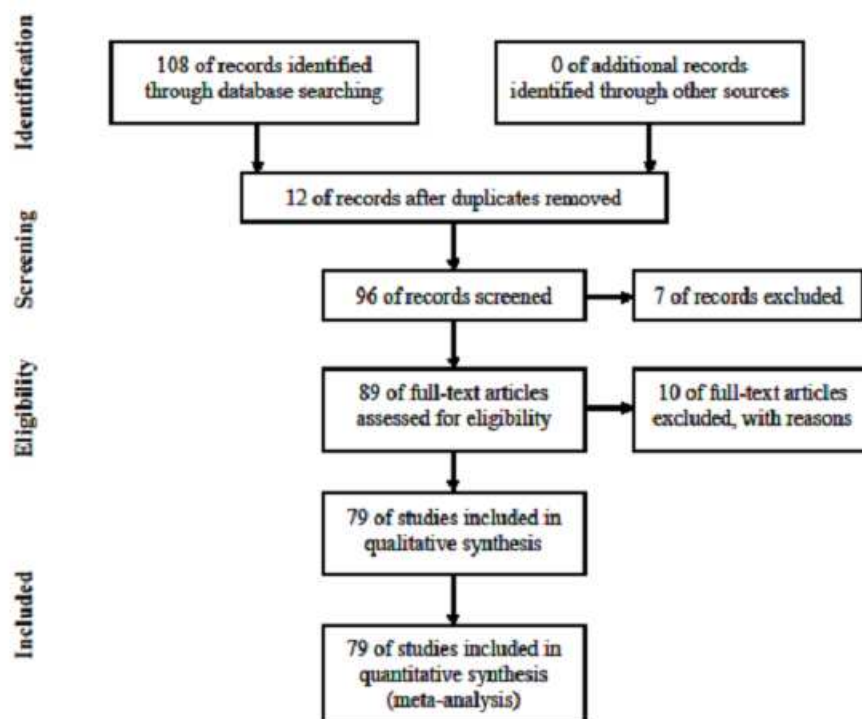

Chart 1: Flow chart of inclusion of studies to the systematic review and meta analysis

In 79 studies with a sample of 31765 individuals in Iran during the years 1999 to 2015, 38 articles expressed favorable public health in Iran and the desirable level of public health in Iran was estimated to be 50% (95% CI, 42%-58%).

Table 1: Specifications of articles under review on the status of public health in Iran

ID	Author	Year	City	Statistical Society	Age	Poor public health(%)	Optimal public health(%)	Sample size
(22)	Pur reza	1390	Ghom	Nurses	38.3±6.93	47	53	200
(23)	sharif	1380	Shiraz	Families	---	---	---	1536
(24)	Ghasem bekloo	1391	Khoy	Addicts	---	---	---	48
(25)	Musavi	1387	Shahrood	Patients	---	---	62	100
(26)	Mohammad zade	1389	Ilam	students	35-18	---	---	661
(27)	Sadeghi	1390	Ghom	students	25-20	---	---	240
(28)	Araste	1385	Sanandaj	Staff	37.03±7.06	---	---	506
(29)	Dehkordi	1391	Rasht	Staff	42.06±7.9	47.6	---	252
(30)	Mokremi	1387	Tehran	Staff	48-23	36.7	---	196
(31)	Shahbazi	1393	Ilam	women	53.3±19.8	---	7/98	708
(18)	Najafi	1387	Tehran	Seniors	65>	---	---	1313
(32)	Shayan	1392	Shiraz	women	30.42±6.72	---	---	197
(33)	Shokri	1392	Hamedan	Addicts	---	---	53/3	119
(34)	Imani	1390	Hormozgan	students	21.12±1.44	63.2	36/8	95
(35)	Musarezaei	1393	Esfahan	Nurses	57-22	---	---	380
(36)	Hoseini	1390	shahr kord	women	60-18	---	---	150
(37)	Naghib zade	1392	Ilam	students	20.94±1.82	7.42	25/8	124
(38)	Biglar	1391	Tehran	Staff	---	78	22	25
(39)	Sarikhani	1390	Arak	students	---	---	---	318
(40)	Sadeghi	1389	Kermanshah	women	---	---	---	350
(41)	Asadi	1392	Ahvaz	Nurses	---	---	---	149
(42)	Noori	1391	Tehran	Soldiers	31 -18		19/6	920
(1)	Piltan	1391	Jahrom	students	33-20	62.9	2/6	350
(43)	Aghaei	1389	Hamedan	students	---	---	---	383
(44)	Farhadi	1390	Lorestan	students	19.80±2.05	77.3	22/7	317
(45)	Firuzi	1389	Dargez	students		27.5	72/5	157
(46)	Zareei poor	1389	Koohdasht	women	26.4±6.01	---	---	250
(47)	Foruzande	1390	shahr kord	Patients	60.2±13.6	---	---	252
(48)	Mehrabi	1382	Esfahan	Nurses		7.4	3/5	170
(49)	Khodaei ardakani	---		students	27-15	---	---	167
(50)	Entezari	1388	Yazd	Nurses	---	60.6	2/5	62
(51)	Safa	1387	Khoram abad	Patients	---	---	---	200
(52)	Hojati	1387	Ghorgan	Driver	---	---	63/8	130
(53)	Moghadam tabrizi	1382	Orumie	women	---	72.6	1/3	1181
(54)	Jafari nedoshen	1389	Ghom	students	21.35±14.2	76	24	250
(55)	Nemat poor	1382	Golestan	Families	55-22	42.2	7/58	66
(56)	Behroozian	1388	Mahshahr	Staff	---	---	2/85	77
(57)	Shakeri	1382	Kermanshah	women	35-23	56	44	150
(58)	Rafati	1378	Shiraz	students	---	---	24/8	307
(59)	Motaghi poor	1384	Tehran	Adult	13±13	---	---	927
(60)	Tabatabaei	1388	Mashhad	students	---	---	14	240
(61)	Nazari	1384	Tehran	Staff	34.38±9.4	---	---	1538
(62)	Ghasemi	1392	Tehran	women	62.58±9.58	---	72/5	200
(63)	Shahrookhi	1380	Ghazvin	women	64-20	---	35	120
(64)	Saberi	1387	Tehran	Judge	---	---	32/7	327
(65)	Soleimani	1385		Nurses	---	67.3	10/2	520
(66)	Nasti zaei	1388	Zahedan	Staff	---	76.6	23/4	150
(67)	Samimi	1385		students	---	71.6	1/6	1300
(68)	Mehri	1388	Sabzevar	students	---	---	39	270
(69)	Abasi	1386	Tehran	Patients	44.30±6.56	---	77/4	93
(70)	Mohamadbeigi	1387	Arak	students	---	---	---	304
(71)	Jamilian	1389	Arak	women	---	60	54/6	295
(72)	Kashef	1381		Staff	---	71.6	13/2	250
(73)	Ansari	1386	Zahedan	students	---	61.2	38/8	240
(74)	Ghaljaei	1389	Zahedan	Nurses	---	57.8	11/8	180
(75)	Hojati	1387	Golestan	Nurses	31.8	60.6	2/5	124
(76)	Salehi	1386	Ghorgan	Patients	---	---	---	91
(77)	Rahmani	1389	Tabriz	Nurses	---	37.3	30/5	315
(78)	Zare	1391	Sirjan	Workers	---	---	29/4	345
(79)	Amini	1388	Esfahan	Nurses		73		158
(80)	Bastani	1389	Tehran	women	60-18	24	58/7	150
(81)	Radfar	1381	Tehran	Children of Veterans	---	33		5317
(82)	Mardani hamule	1387	Ahvaz	Patients	---	15.7	46/4	140
(83)	Foroosh	1390	Tehran	Staff	---	---	---	120
(84)	Omidian	1384	Yazd	students	---	56.7	15/7	554
(85)	Hasan shahi	1383	Shiraz	Addicts	---	---	87/7	120
(86)	Rafeiei	1389	Arak	students	---	32.1	67/9	315
(87)	Shamsaei	1389	Hamedan	people	50-36	70.4	29/5	1800
(88)	Rahmani Anaraki	1388	Golestan	Caregivers	31.78±9.94	---	72/5	200
(89)	Talemi	1391	Rasht	students	---	66.1	---	224
(90)	Noori	1385		Soldiers	26-18	---	84	92
(91)	Rahimpoor	1389	Babol	Nurses	31.12±4.14	36.7	5/2	240
(92)	Pirzade	1389	Esfahan	students	24.4±1.11	1.4	95/9	123
(4)	Ahmadi	1386	Shahrood	Nurses	---	5.6	64/1	360
(93)	Molazade	1392	Fasa	students	20.8±1.6	69.7	30	380
(94)	Sepehrmanesh	1389	Kashan	Nurses	33.9±7.29	---	38/3	47
(95)	Heidari	1391	Boroojen	Staff	---	40.2	59/8	123
(96)	Dastjerdi	1381	Birjand	students	39-17	---	---	287
(97)	Solhi	1391	Chaloos	women	---	3.9	71/5	130

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The least optimal public health in Iran was 4% in the study of Solhi et al in 2012 (95%CI, 1%-7%) and the most optimal public health in Iran was 78% in the study of Biglar et al in 2012 (95%CI, 62%-94%). Due to the heterogeneity between studies, confidence interval for each study is shown in Figure 1 based on random-effects model.

Unfavorable general health was 40% in Iran (95% CI, 33%-46%), fairly optimal public health was 30% (95% CI, 24%-35%), poor general health in women was 47% (95% CI, 36%-59%), and poor general health in men was 36% (95% CI, 18%-55%).

Also, the prevalence of mental disorders was 50% in Iran (95% CI, 30%-70%), physical disorders prevalence was 38% (95% CI, 25%-51%), anxiety and insomnia prevalence was 40% (95% CI, 29%-52%), depressive disorders prevalence was 40% (95% CI, 29%-52%) and impaired social functioning prevalence was 46% (CI 95%, 33%-59%) (Table 2).

Table 2: The status of public health in the groups studied in Iran

Sub groups	Number of study	Sample size	General health status(CI95%)	MAX General health status(CI95%)	MIN General health status(CI95%)
Optimal public health in iran	38	16983	%50(%42-%58)	%50(%42-%58)	%4(%1-%7)
Poor public health in Iran	51	15251	%40(%33-%46)	%96(%92-%99)	%1(%1-%2)
Fairly Optimal public health in iran	10	2059	%30(%24-%35)	%58(%52-%64)	%17(%11-%23)
Poor public health in women	15	4842	%47(%36-%59)	%80(%77-%83)	%1(%0-%2)
Poor public health in men	7	1252	%38(%18-%55)	%69(%59-%79)	%5(%3-%8)
Psychopathy	9	1918	%50(%30-%70)	%92(%89-%95)	%6(%-10-%22)
Physical impairment	18	1213	%38(%25-%51)	%85(%77-%93)	%5(%-0-%11)
Anxiety and insomnia	20	1630	%40(%29-%52)	%76(%66-%86)	%5(%-10-%20)
Depression	18	1528	%40(%29-%52)	%84(%79-%90)	%5(%-12-%22)
Social dysfunction	20	1733	%46(%33-%59)	%94(%88-%99)	%14(%-7-%14)

The status of public health was different in various parts of Iran. The optimal public health was 44% in the 12 studies carried out in northern Iran (CI 95%, 32%-56%) and 65% in 4 studies conducted in southern Iran (95% CI, 56%-73%). It was 43% in 11 studies in central Iran (95% CI, 25%-60%) and 58% in 7 studies in western Iran (95% CI, 44%-71%). There was only one study in the East of Iran.

In the analysis that was done in terms of population, the optimal public health of students was 60% in 12 studies (95% CI, 45%-74%), optimal public health of nurses was 45% in 10 studies (95% CI, 27%-64%), optimal public health of women was 43% in 5 studies (95% CI, 11%-76 %), and optimal public health of staff was 58% in 6 studies (95% CI, 43%-73%). There was only one study in other statistical populations examined in this study.

According to the meta-regression graph, there is no significant relationship between the public health status and the sample size in Iran (P =0.974) (Figure 4). The meta-regression showed that there was no significant relationship between the public health status and the year of study in Iran (P =0.485) (Figure 5). Sensitivity analysis was used to assess the effect of each study on the final result.

Study ID		ES (95% CI)	% Weight
Solhi (2012)		0.04 (0.01, 0.07)	2.67
Pirzade (2010)		0.04 (0.01, 0.08)	2.66
Ahmadi (2007)		0.06 (0.03, 0.08)	2.67
Mehrabi (2003)		0.07 (0.03, 0.11)	2.66
Mardani hamule (2008)		0.16 (0.10, 0.22)	2.64
Bastani (2010)		0.24 (0.17, 0.31)	2.63
Nemat poor (2003)		0.24 (0.14, 0.35)	2.57
Firuzi (2010)		0.28 (0.21, 0.34)	2.63
Rafeiei (2010)		0.32 (0.27, 0.37)	2.65
Radfar (2002)		0.33 (0.32, 0.34)	2.67
Mokremi (2008)		0.37 (0.30, 0.43)	2.63
Rahimpoor (2010)		0.37 (0.31, 0.43)	2.64
Rahmani (2010)		0.37 (0.32, 0.43)	2.65
Heidari (2012)		0.40 (0.32, 0.49)	2.60
Pur reza (2011)		0.47 (0.40, 0.54)	2.63
Dehkordi (2012)		0.48 (0.41, 0.54)	2.64
Shakeri (2003)		0.56 (0.48, 0.64)	2.61
Omidian (2005)		0.57 (0.53, 0.61)	2.66
Ghaljaei (2010)		0.58 (0.51, 0.65)	2.62
Jamilian (2010)		0.60 (0.54, 0.66)	2.64
Entezari (2009)		0.61 (0.48, 0.73)	2.53
Hojati (2008)		0.61 (0.52, 0.69)	2.60
Ansari (2007)		0.61 (0.55, 0.67)	2.64
Piltan (2012)		0.63 (0.58, 0.68)	2.65
Imani (2011)		0.63 (0.54, 0.73)	2.58
Talemi (2012)		0.66 (0.60, 0.72)	2.64
Soleimani (2006)		0.67 (0.63, 0.71)	2.66
Molazade (2013)		0.70 (0.65, 0.74)	2.65
Shamsaei (2010)		0.70 (0.68, 0.73)	2.67
Samimi (2006)		0.72 (0.69, 0.74)	2.67
Kashef (2002)		0.72 (0.66, 0.77)	2.64
Moghadam tabrizi (2003)		0.73 (0.70, 0.75)	2.67
Amini (2009)		0.73 (0.66, 0.80)	2.63
Naghib zade (2013)		0.74 (0.66, 0.82)	2.62
Jafari nedoshen (2010)		0.76 (0.71, 0.81)	2.65
Nasti zaei (2009)		0.77 (0.70, 0.83)	2.63
Farhadi (2011)		0.77 (0.73, 0.82)	2.65
Biglar (2012)		0.78 (0.62, 0.94)	2.43
Overall (I-squared = 99.3%, p = 0.000)		0.50 (0.42, 0.58)	100.00

NOTE: Weights are from random effects analysis
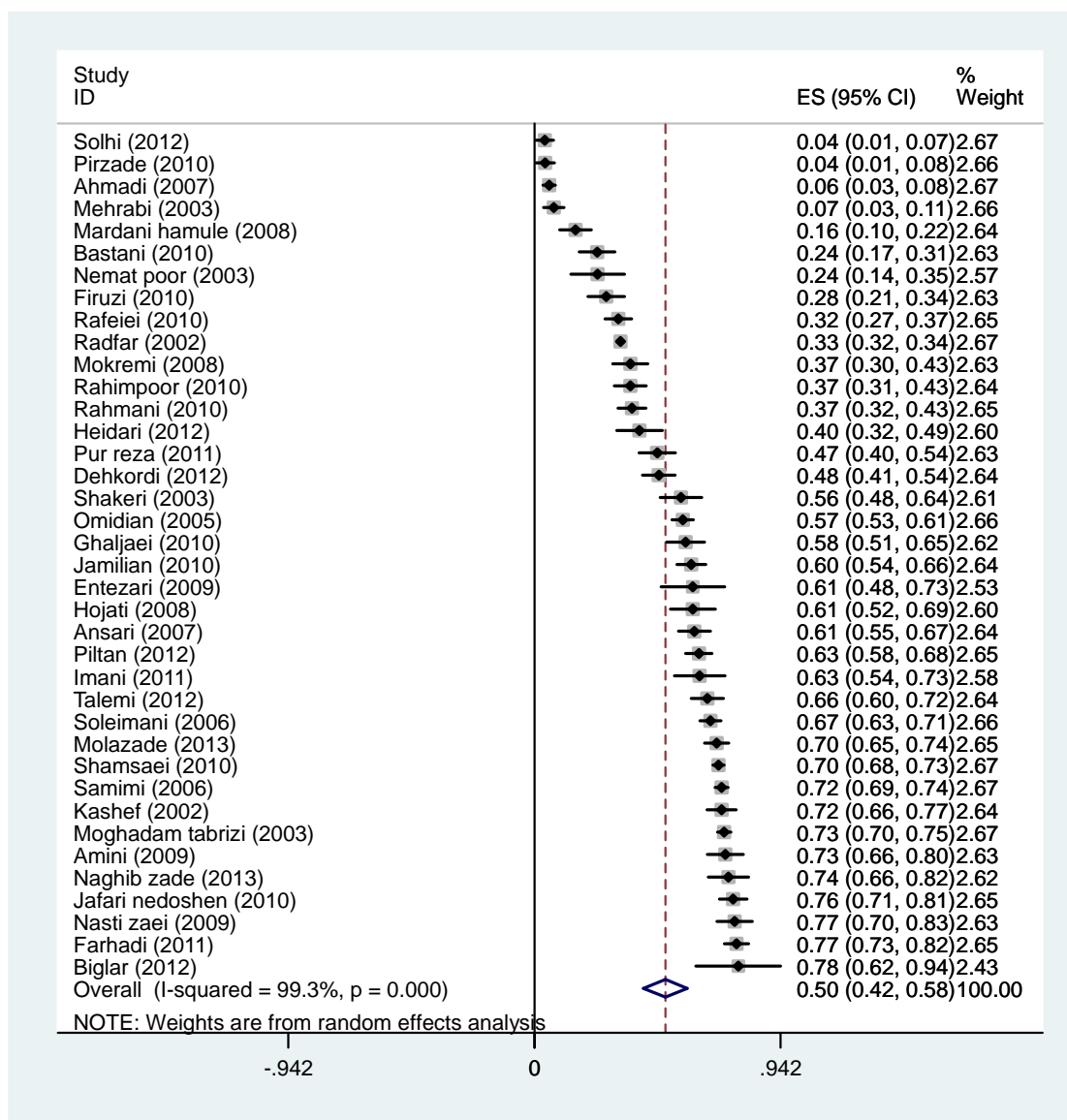
-.942   0   .942

Figure 1. Optimal public health in Iran and its 95% CI in Iran based on author's name, year of the study and random effects model. The midpoint of each segment showed optimal public health in each study. Rhombus shape indicated optimal public health in Iran in all studies
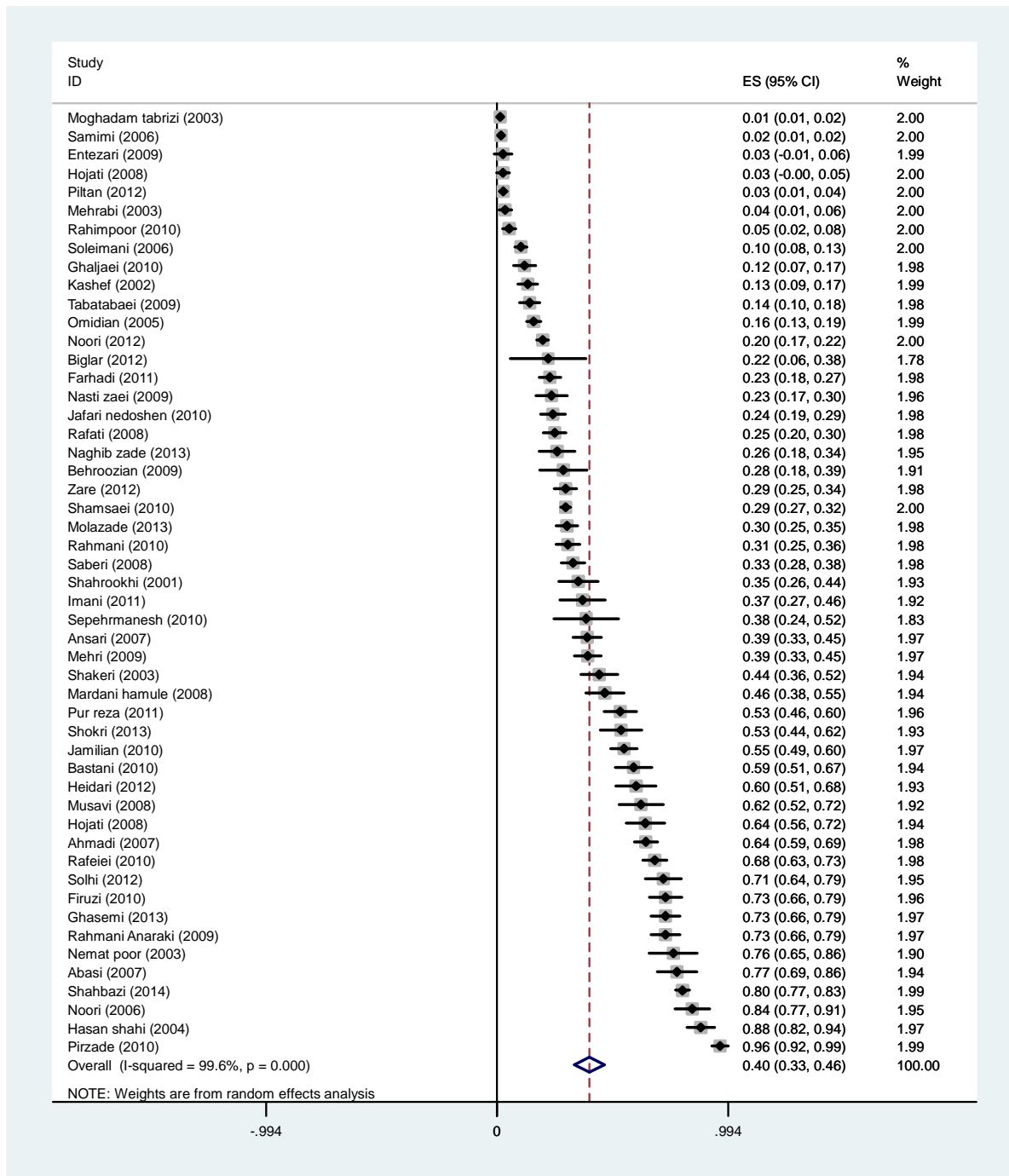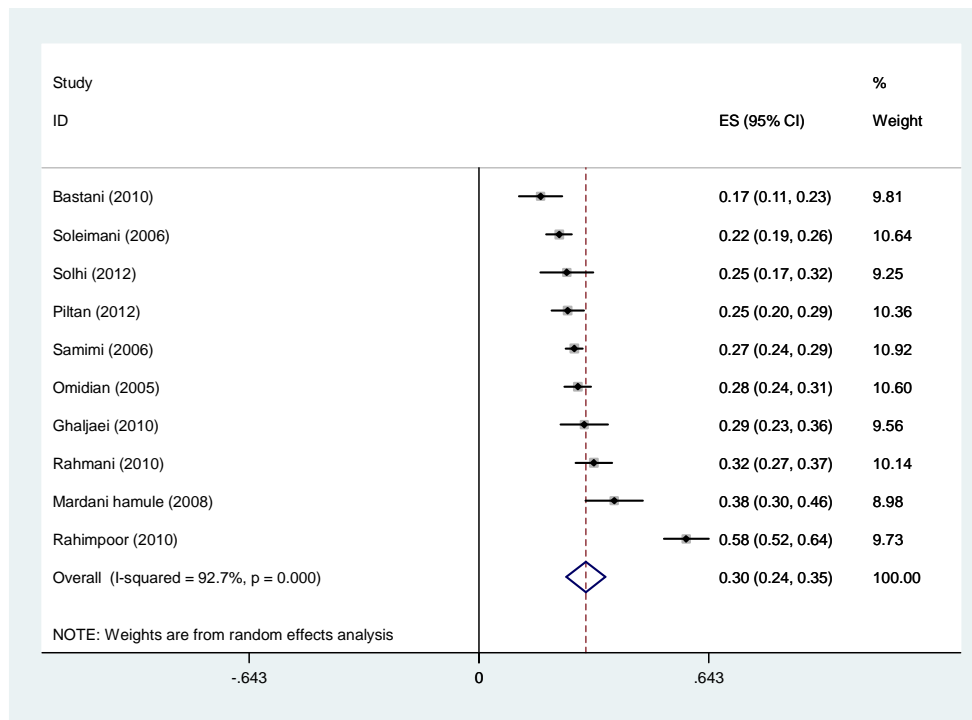
Study ID	ES (95% CI)	% Weight
Moghadam tabrizi (2003)	0.01 (0.01, 0.02)	2.00
Samimi (2006)	0.02 (0.01, 0.02)	2.00
Entezari (2009)	0.03 (-0.01, 0.06)	1.99
Hojati (2008)	0.03 (-0.00, 0.05)	2.00
Piltan (2012)	0.03 (0.01, 0.04)	2.00
Mehrabi (2003)	0.04 (0.01, 0.06)	2.00
Rahimpoor (2010)	0.05 (0.02, 0.08)	2.00
Soleimani (2006)	0.10 (0.08, 0.13)	2.00
Ghaljaei (2010)	0.12 (0.07, 0.17)	1.98
Kashef (2002)	0.13 (0.09, 0.17)	1.99
Tabatabaei (2009)	0.14 (0.10, 0.18)	1.98
Omidian (2005)	0.16 (0.13, 0.19)	1.99
Noori (2012)	0.20 (0.17, 0.22)	2.00
Biglar (2012)	0.22 (0.06, 0.38)	1.78
Farhadi (2011)	0.23 (0.18, 0.27)	1.98
Nasti zaei (2009)	0.23 (0.17, 0.30)	1.96
Jafari nedoshen (2010)	0.24 (0.19, 0.29)	1.98
Rafati (2008)	0.25 (0.20, 0.30)	1.98
Naghib zade (2013)	0.26 (0.18, 0.34)	1.95
Behroozian (2009)	0.28 (0.18, 0.39)	1.91
Zare (2012)	0.29 (0.25, 0.34)	1.98
Shamsaei (2010)	0.29 (0.27, 0.32)	2.00
Molazade (2013)	0.30 (0.25, 0.35)	1.98
Rahmani (2010)	0.31 (0.25, 0.36)	1.98
Saberi (2008)	0.33 (0.28, 0.38)	1.98
Shahrookhi (2001)	0.35 (0.26, 0.44)	1.93
Imani (2011)	0.37 (0.27, 0.46)	1.92
Sepehrmanesh (2010)	0.38 (0.24, 0.52)	1.83
Ansari (2007)	0.39 (0.33, 0.45)	1.97
Mehri (2009)	0.39 (0.33, 0.45)	1.97
Shakeri (2003)	0.44 (0.36, 0.52)	1.94
Mardani hamule (2008)	0.46 (0.38, 0.55)	1.94
Pur reza (2011)	0.53 (0.46, 0.60)	1.96
Shokri (2013)	0.53 (0.44, 0.62)	1.93
Jamilian (2010)	0.55 (0.49, 0.60)	1.97
Bastani (2010)	0.59 (0.51, 0.67)	1.94
Heidari (2012)	0.60 (0.51, 0.68)	1.93
Musavi (2008)	0.62 (0.52, 0.72)	1.92
Hojati (2008)	0.64 (0.56, 0.72)	1.94
Ahmadi (2007)	0.64 (0.59, 0.69)	1.98
Rafeiei (2010)	0.68 (0.63, 0.73)	1.98
Solhi (2012)	0.71 (0.64, 0.79)	1.95
Firuzi (2010)	0.73 (0.66, 0.79)	1.96
Ghasemi (2013)	0.73 (0.66, 0.79)	1.97
Rahmani Anaraki (2009)	0.73 (0.66, 0.79)	1.97
Nemat poor (2003)	0.76 (0.65, 0.86)	1.90
Abasi (2007)	0.77 (0.69, 0.86)	1.94
Shahbazi (2014)	0.80 (0.77, 0.83)	1.99
Noori (2006)	0.84 (0.77, 0.91)	1.95
Hasan shahi (2004)	0.88 (0.82, 0.94)	1.97
Pirzade (2010)	0.96 (0.92, 0.99)	1.99
Overall (I-squared = 99.6%, p = 0.000)	0.40 (0.33, 0.46)	100.00

NOTE: Weights are from random effects analysis

Figure 2. Poor public health in Iran and its 95% CI in Iran based on author's name, year of the study and random effects model. The midpoint of each segment showed poor public health in each study. Rhombus shape indicated poor public health in Iran in all studies

Figure 3. Fairly optimal public health in Iran and its 95% CI in Iran based on author's name, year of the study and random effects model. The midpoint of each segment showed fairly optimal public health in each study. Rhombus shape indicated fairly optimal public health in Iran in all studies
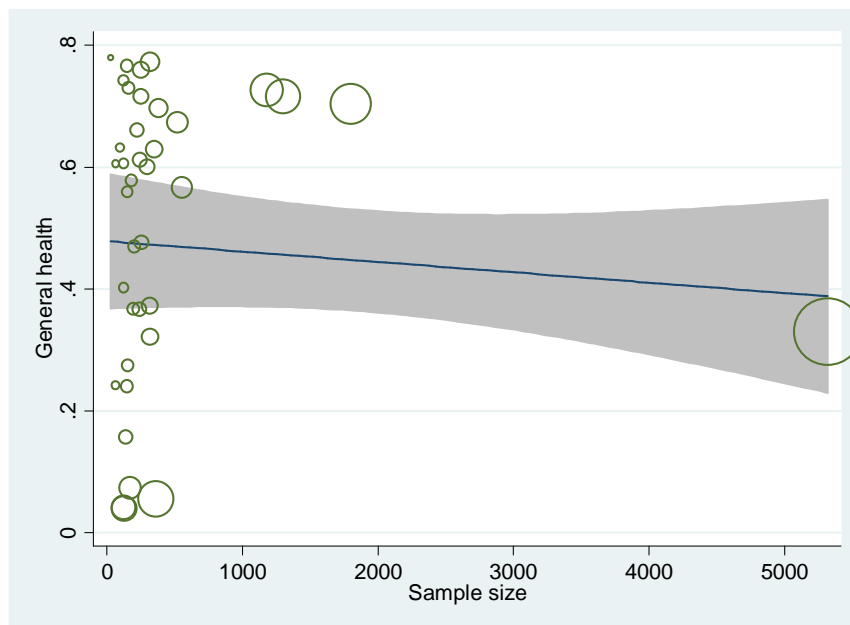

Figure 4. The relationship between public health status and sample size in Iran using meta-regression
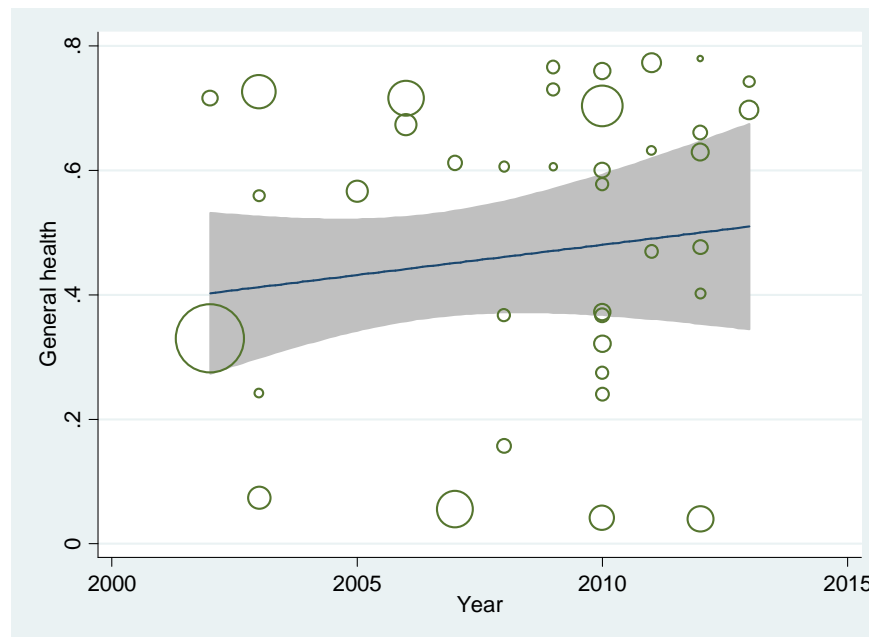
Figure 5. The relationship between public health status and year of study in Iran using meta-regression

DISCUSSION

79 studies were reviewed with a sample size of 31765 individuals from 1999 to 2015 and 38 articles expressed an optimal general health for Iran. The optimal general health in Iran was 50% (95% CI, 42%-58%). The least optimal public health in Iran was 4% in the study of Solhi et al in 2012 (95% CI, 1%-7%) and the most optimal public health in Iran was 78% in the study of Biglar et al in 2012 (95% CI, 62%-94%). Unfavorable general health was 40% in Iran (95% CI, 33%-46%), fairly optimal public health was 30% (95% CI, 24%-35%). As a result, it can be stated that public health problems in Iran are noticeable. The research was Imani did a study in Hormozgan and estimated optimal public health to be 63.2% and poor general health to be 36.8% (34) which is in line with our study. However, Pourreza (1390) reported an optimal public health of 47% and a poor public health of 53% (22) and this report is not consistent with our study.

Poor general health was 47% in women and 36% in men. Based on these results, general health disorders are more prevalent in women than men. Perhaps, the reason is the existence of differences between men and women and various events (maturity- pregnancy, etc.) that occurs for women throughout life. The research carried out in Iran show that women suffer more from problems than men due to different reasons do not have an optimal health condition and experience numerous physiological and psychological disorders and trauma along with women in other countries (98). In another study, Shokri estimated poor general health in women and men of Hamedan in 2013 reporting the poor general health of 66.8% in women and 59.3% in men (33) that is consistent with our study have. Meanwhile, Ali Farhadi reported a poor public health of 20.4% for female students 23.8% for male students in Lorestan (44)which is not in line with our study.

Also, the prevalence of mental disorders was 50% in Iran, physical disorders prevalence was 38% (95% CI, 25%-51%), anxiety and insomnia prevalence was 40%, depressive disorders prevalence was 40% and impaired social functioning prevalence was 46%. Sharif conducted a study on 1536 individuals in the city of Shiraz and reported the prevalence of 22.9% for mental disorders. Shayan (2013) studied 197 women and estimated the prevalence of mental disorders to be 85.3% (23). Mokarrami (2008) conducted a study on 196 people in Tehran and reported the prevalence of 40.8% for mental disorders, 42.9% for anxiety and insomnia, 7.5% for depressive disorder and 34.7% for social disruption (30). In a study in Birjand, 8.6% of admitted students to University of Medical Sciences were suspected of mental disorders and 9.1% suffered from impaired social functioning and anxiety (96).

The status of optimal public health was different in various parts of Iran. The optimal public health in the 12 studies carried out in northern Iran was 44% and 65% in 4 studies conducted in southern Iran. It was 43% in 11 studies in central Iran and 58% in 7 studies in western Iran. There was only one study in the East of Iran. Southern and central Iran had the most and least optimal public health prevalence.

In the analysis that was done based on population, the optimal public health of students was 60% in 12 studies, optimal public health of nurses was 45% in 10 studies, optimal public health of women was 43% in 5 studies, and optimal public health of clerks was 58% in 6 studies. Students and clerks had the most and least optimal public health prevalence.

Based on the meta-regression graph, there was no significant relationship between the public health status and the sample size in Iran (P =0.974) (Figure 4). Namely, the prevalence of public health in Iran did not decrease by increasing the sample size. In this figure, circle size showed the largeness of the sample size (Figure 4). The meta-regression showed that there was no significant relationship between the public health status and the year of study in Iran (P =0.485) and the prevalence of public health did not increase in Iran during the years examined in this study, from 1999 to 2015 (Figure 5).

Circle show relative risk (RR) by removing studies and segments show the 95% CI for RR. This figures shows effect of the removal of any study on the final outcome of this study. Based on the above figure, the prevalence of public health in Iran increases to 51.34% by removing the study of Solhi in 2012 (95% CI, 43.56% to 59.67%) and the prevalence of public health in Iran decreases to 49.34% by removing the study of Farhadi in 2011 (95% CI, 40.2% to 57.9%). Theses two are the most effective studies in end result of this research.

Based on the research conducted at the Tehran University of Medical Sciences, 43% of nurses had a poor mental health situation and their mental health was lower than the general population (5). A study conducted at Shahid Beheshti University showed that 31.6% of students were suspected of mental disorders and their scores were higher than 23 (99). Aboulghasemi and Javanmiri showed that mental health has a relationship with academic achievement which means that an increase in mental health increases students' academic achievement (100). Also, Shaiiri and Chatrchi (2004) observed academic achievement in students with mental health (101). Kahrzaii et al (2005) reported the prevalence of mental disorders in students experiencing academic failure (102). Due to obtaining different results from previous studies, carrying out a meta-analysis study is necessary.

The prevalence of mental disorders was reported to be 44.3% in a study of 273 pregnant women in early pregnancy in Pakistan (103). However, a study of 108 pregnant women in Japan reported the prevalence of this disorder to be 17% and 13% in the first and third quarters of pregnancy, respectively (104). In a study among medical students at the University of Malaysia, it was found that 41.9% of medical students had psychological stress and psychological disorders (105). The prevalence of mental health disorders among students from developed countries is 10 to 12% and is known as one of the important causes of students' expulsion, academic failure and dropout (106). Studies conducted in the field of mental health in different countries have mentioned a prevalence of 34% to 48.8% for mental disorders among nurses (107).

CONCLUSION

The results of this study indicate the high levels of public health disorders and in particular mental health disorders as the most important component of general health. Therefore, planning and intervention measures at macro and micro levels in society are required to improve mental health in different classes.

The limitations of the present study included lack of access to full-text articles and lack of uniform distribution of studies between different regions of the country.

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