

# The Relationship Between Mental Health and Resilience: A Systematic Review and Meta-Analysis

Reza Ghanei Gheshlagh,<sup>1</sup> Kourosh Sayehmiri,<sup>2</sup> Abbas Ebadi,<sup>3</sup> Asghar Dalvandi,<sup>4</sup> Sahar Dalvand,<sup>5</sup> Sadat

Seyed Bagher Maddah,<sup>6</sup> and Kian Norouzi Tabrizi<sup>4,\*</sup>

<sup>1</sup>Assistant Professor, Clinical Care Research Center, Kurdistan University of Medical Sciences, Sanandaj, Iran

<sup>2</sup>Associate Professor of Biostatistics Group, Research Center for Prevention of Psychosocial-Social Injuries, Medical Faculty, Ilam University of Medical Sciences, Ilam, Iran

<sup>3</sup>Associate Professor, Behavioral Sciences Research Center, Nursing Faculty, Baqiyatallah University of Medical Sciences, Tehran, IR Iran

<sup>4</sup>Associate Professor, Department of Nursing, University of Social Welfare and Rehabilitation Sciences (USWR), Tehran, IR Iran

<sup>5</sup>MSc in Biostatistics, Social Determinants of Health Research Center, Kurdistan University of Medical Sciences, Sanandaj, IR Iran

<sup>6</sup>Assistant Professor, Nursing Department, University of Social Welfare and Rehabilitation Sciences (USWR), Tehran, IR Iran

\* Corresponding author: Kian Norouzi Tabrizi, Associate Professor, Department of Nursing, University of Social Welfare and Rehabilitation Sciences (USWR), Tehran, IR Iran. Tel: +98-9122073826, Fax: +98-2122180036, E-mail: dr.kian\_nourozi@yahoo.com

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## Abstract

**Context:** Considering the stressful conditions of life and social difficulties, an important question is why are some people can show positive adaptation and avoid mental health disorders, while others cannot? The present study aimed at reviewing the national studies on the correlation between resilience and mental health.

**Evidence Acquisition:** In this systematic review, all national articles published in international and national databases were searched without restrictions, using the following keywords: “Resilience OR Resiliency” AND “Mental health” OR “General Health” and their combinations. The Persian equivalents of these words were also used in Persian language sites. Finally, based on PRISMA guidelines, 15 studies were selected. The results of these studies were combined using the random effects model of meta-analysis.

**Results:** In the present research, 16 correlation studies were examined without time limits, and with a sample size of 3157. Overall, a positive correlation was found between resilience and mental health in the national studies ( $r = 0.48$ ). The results showed that the correlation between resilience and mental health was lower in the population of school and university students than among other populations ( $r = 0.39$ , compared to  $r = 0.54$ ). The analysis based on geographical division indicated that the highest correlation between resilience and mental health existed in the fifth area ( $r = 0.83$ ), and the lowest correlation was found in the fourth area ( $r = 0.35$ ).

**Conclusions:** By providing cognitive, behavioral and emotional responses in stressful situations, resilience can maintain and improve mental health.

**Keywords:** Mental Health, Resilience, Meta-Analysis, Iran

## 1. Context

Health is a multidimensional concept, denoting not only an absence of disease and disability, but also a feeling of happiness and welfare. Nowadays, more attention is paid to the positive aspects of health so that people can use their strengths as a protective shield against mental disorders (1, 2). Health is characterized by compatibility and self-management in response to challenges (3). What is meant by mental health is the ability to carry out everyday activities, establish proper relationship, and exhibit proper social and cultural behavior (4). Mental health is considered as intellectual, emotional and spiritual development, positive self-perception, a sense of dignity and physical health, and interpersonal harmony (5, 6).

Stress is among the important factors threatening mental health, and people are faced with numerous so-

cial, cognitive, and physiological stressors and experience varying degrees of stress in their everyday lives (7). Accumulation of daily stress and the occurrence of unpleasant events in life, like the death of loved ones, sickness, accidents, economic problems, social injustice, and workplace problems, would affect individuals' physical and mental health, and in the long term, can lead to physical and mental disorders (8-10). The central statistical office reported that mental problems have been increasingly widespread among different groups, with about 18.2% of males and 24.7% of females suffering from mental problems (11).

One out of 5 people in the world has one type of mental disorder, which would affect his/her individual, professional, and social performance (12, 13). Common mental disorders, like anxiety and depression, will become the most common diseases by 2030 (more than cardiovascular diseases and car accidents) (14).

Although individuals purposefully deal with stress, they do not necessarily choose the best response and do not address their problems with similar methods (15); in other words, the method of addressing problems and stresses varies in different individuals (16). By using favorable coping strategies, individuals can adapt themselves to their problems and maintain their mental health; however, ineffective coping methods can lead to an increase in stress (17). If stress is managed well, then, individuals will be able to cope with the needs and challenges of their lives in a better way (become compatible) (18).

Resilience is an individual adaptation in dealing with stressful factors such as injuries, threats, tragedies, interpersonal, and family problems, financial and occupational problems, and medical and health problems, which can mediate the negative effects of stress (19, 20). Bonanno (2004) views resilience as going back and continuing one's natural performance in dealing with stress (15). Masten et al. (1990) considers resilience as the process, capacity, or outcome in which individuals succeed in adaptation in spite of challenges and threats (21). Coping is a set of skills that focuses on the process of adaptation, and resilience is the successful outcome of employing these skills. Not all coping skills are positive neither do they necessarily result in a good outcome; they sometimes fail (22-24), due to the fast and effective recovery of resilience, some researchers describe it as mental resilience (25, 26).

The present study aimed at answering the following question: why do some people, despite experiencing stressful conditions in life and having difficult social situations involving violence, poverty, stress, injuries or deprivation, preserve their positive adaptation and experience no disorder in their mental health?

## 2. Evidence Acquisition

### 2.1. Data Source

The present study was a systematic review and meta-analysis, reviewing the relationship between mental health and resilience in Iranian studies, with no time restrictions and based on PRISMA guidelines (27).

### 2.2. Search Strategy

International and national databases such as Google Scholar, Science Direct, PubMed, Pre Quest, Scopus, Scientific Information Database (SID), IranMedex, and MagIran were searched in this review. Articles were searched using the following keywords: "Resilience OR Resiliency" AND "Mental health" OR "General Health" and their combinations. Also, the Persian equivalents of these words were used in Persian language sites. To find more articles, the

sources of the collected articles were reviewed as well. Finally, 16 studies were selected.

### 2.3. Inclusion and Exclusion Criteria

The researchers in the present study initially collected all the articles that analyzed the relationship between mental health and resilience. Studies were accepted based on the inclusion and exclusion criteria. The non-intervention (observational) studies that dealt with the correlation between mental health and resilience were included in the study.

Based on the inclusion and exclusion criteria, the 2 authors of this article (independently) screened the collected articles based of their titles and abstracts first, and then, they reviewed the full texts to ensure that the articles met the requirements.

### 2.4. Data Extraction

The form used to extract information included the following variables: the first author of the article, the publication year of the article, the place where the study was conducted, type of study, the scales to measure mental health and resilience score, target population (school and university students and others), and the correlation between the 2 variables. Data were extracted by 2 reviewers independently, and in the event of disagreement between the reviewers, the article was refereed by the second author (Sayehmiri). The blinding method was used to reduce publication bias, ie, the authors who extracted data did not have any information about the articles and journals.

### 2.5. Statistical Analysis

In this meta-analysis study, the data analysis was performed using random effects model (Mantel-Haenszel). The mean standard error for each study was calculated through normal distribution. The effect size in each study was calculated through the Equation 1, in which  $r$  is the correlation coefficient in each study. To change  $Z$  values to  $r$  the formula 2 was used.

$$Z = 0.5 \ln \frac{1+r}{1-r} \quad (1)$$

$$r = \frac{\exp(2z) - 1}{\exp(2z) + 1} \quad (2)$$

After changing the  $z$  scores, the pooled effect size was estimated through the random effects model. To examine any irregularity (inconsistency) in the studies included in the review, Chi-square test, with a significance level of 0.01, and the I<sup>2</sup> index were used (an I<sup>2</sup> index of less than 25% is considered as low heterogeneity, between 25% and 75% as

moderate heterogeneity, and more than 75% as high heterogeneity). The I2 index shows what percentage of the differences observed among different studies are due to the heterogeneity of studies. In the present study, the I2 index was considered more than 75%. Heterogeneity was also examined through meta-regression and an analysis of the subgroups. Univariable and multivariable methods were employed to analyze the reasons for heterogeneity among studies. Egger's test was also used to study the possibility of publication bias.

### 3. Results

In the present research, 15 studies on correlation were selected without time restrictions. The sample size of the study was 3157, with an average of 197 people per study (Figure 1).

The smallest and biggest sample sizes, respectively, belonged to the study by Aghayusefi and Bazyari Meymand (2013) (28) with 50 people and the one by Khakpour (2012) with 426 people (29). The correlation between resilience and mental health in the national studies was 0.48 (Table 1).

The studies on each research population were analyzed separately. The results revealed that the correlation between resilience and mental health was lower in the population of school and university students than among other groups ( $r = 0.39$  vs.  $r = 0.54$ ). After changing z scores to r, the analyses based on the kind of scale used to assess resilience indicated that the correlation between the resilience measured through Connor Davidson resilience scale (CD-RISC) and mental health was greater than the correlation measured through other scales for the assessment of resilience ( $r = 0.51$  vs.  $r = 0.28$ ); however, the correlation between mental health measured through GHQ-28 (general health questionnaire 28) was lower than the one measured through other scales for the assessment of mental health ( $r = 0.46$ , compared to  $r = 0.49$ ). The analyses based on geographical divisions indicated that the highest correlation between resilience and mental health belonged to the area 5 of the country ( $r = 0.83$ ), while the lowest correlation between these variables in the studies belonged to the area 4 of Iran ( $r = 0.35$ ) (Table 2).

The funnel plot indicates that there is no publication bias in this study ( $P = 0.350$ ) (Figures 2 and 3).

### 4. Conclusions

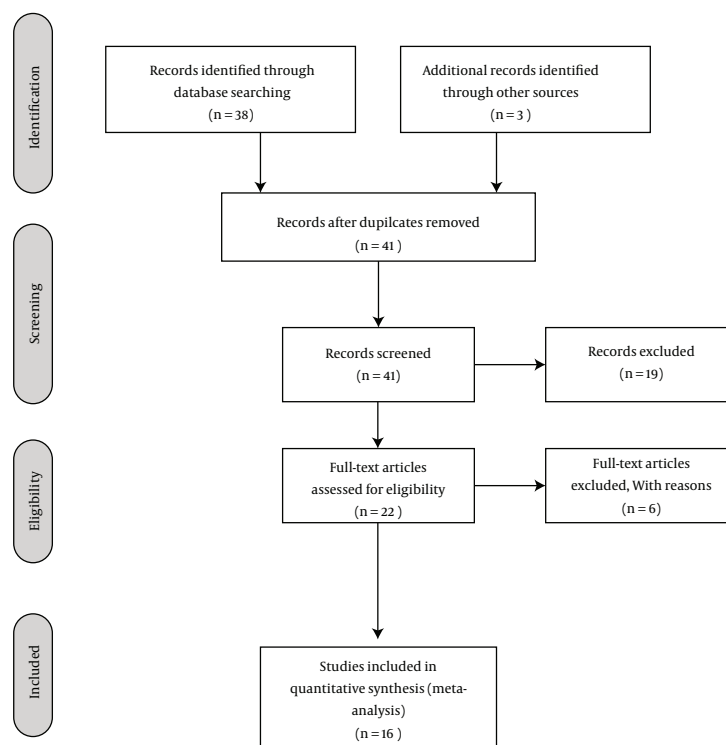
This meta-analysis revealed a moderate correlation between mental health and resilience. This finding is compatible with that of Siriwardhana et al. (2014) and Hart-

ley (2011) (44, 45). Resilience is the capacity of an individual to demonstrate psychological health in a situation in which society views it as aversive (46). In the studies by Lee et al. (2013) and Hu et al. (2015) there was a significant relationship between resilience and mental health; more resilient people had a better mental health (47, 48). The results of the study by Ziaian et al. (2012) showed that resilient individuals have less emotional behavioral problems and depression. In other words, resilience can protect people against mental disorders (49). Due to its potential impacts on health, welfare, and how people respond to different challenges at different ages, resilience receives a lot of attention in the political and clinical arenas. Important international financiers such as medical research council and economic and social research council in England have identified resilience as an important factor for the health and welfare of people (50).

The findings of the present study indicated that the correlation between resilience and mental health was lower among school and university students than among other groups, which can be due the nature of this difficult period of life. This finding was not consistent with that of Rajabi et al. who reported a high correlation ( $r = 0.58$ ) between mental health and resilience among students (51). School and university students should enjoy good mental health to be successful in their education. Although the challenges of this period may threaten their mental health, resilience enables them to use their capacity in difficult situations to achieve success and personal development; moreover, it enables them to benefit from these challenges as an opportunity to empower themselves despite the risk factors (30, 52).

The results of a study by Dray et al. (2014) revealed that resilience-based interventions can decrease mental health problems (53). Overall, resilience allows individuals to use obstacles as a chance for growth and improvement with the help of time, energy, and existing resources (54). In the present study, the correlation between resilience and mental health was higher using Connor Davidson Resilience Scale compared with the other scales used for the assessment of resilience. Moreover, the correlation between resilience and mental health using GHQ-28 scale was lower compared with other scales used for the assessment of mental health. Additionally, the correlation between resilience and mental health in the Northern and Eastern areas of Iran was higher than in other areas; this result can be attributed to the culture and economic and social status. Resilience is a cultural construct and culture can even affect the stressors that people experience (50, 55, 56).

In explaining the relationship between resilience and mental health, it can be stated that to mediate difficult situations, resilient people rely on a number of individual, so-



**Figure 1.** Flow Chart of the Study and Selection of Articles Based on PRISMA Steps

**Table 1.** Specifications of the Conducted Studies

No.	First Author/Year	Sample size	Place	Target Population	Resilience Scale	Mental Health Scale	Correlation	95% CI		P Value
								Lower	Upper	
1	Akbarzadeh et al. (2014) (30)	142	Tabriz	Fire Department workers	CD-RISK	GHQ-28	0.47	0.31	0.64	0.01
2	Bahri et al. (2014) (31)	131	Shiraz	Parents	CD-RISK	GHQ-28	0.41	0.24	0.59	0.0001
3	Besharat and Jahed (2014) (32)	75	Ray	University students	ERS	GHQ-28	0.05	-0.18	0.28	0.05
4	Aghayusefi and Bazari Meymand (2013) (28)	50	Bushehr	Women suffering from migraine	CD-RISC	GHQ-28	0.58	0.30	0.87	0.01
5	Hamid et al. (2012) (33)	100	Kermanshah	Female university students	CD-RISC	GHQ-28	0.51	0.31	0.71	0.01
6	Albukurdi et al. (2012) (34)	140	Shiraz	Male prisoners	RSA	SCL90	0.23	0.07	0.40	0.01
7	Khakpour (2012) (29)	426	Farooj	Parents	CD-RISC	SCL90	0.71	0.61	0.80	0.01
8	Meikaeilei et al. (2012) (35)	100	Sari	Parents	CD-RISC	GHQ-28	0.73	0.53	0.92	0.01
9	Kordestani et al. (2013) (36)	265	Tehran	University students	CD-RISC	GHQ-28	0.31	0.19	0.43	0.01
10	Poursardar et al. (2012) (37)	178	Ramshir	Teacher	CD-RISC	GHQ-28	0.28	0.13	0.43	0.01
11	Azad (2011) (38)	297	Ilam	University students	Philips' resilience	GHQ-28	0.33	0.22	0.45	0.001
12	Mozaffari and Samani (2011) (39)	299	Kazerun	Students	CD-RISC	DASS-21	0.46	0.35	0.57	0.01
13	Haddadi and Besharat (2010) (40)	214	-	Students	CD-RISC	GHQ-28	0.48	0.37	0.59	0.0001
14	Nezhad and Besharat (2008) (41)	139	Tehran	Athlete students	CD-RISC	MHI	0.63	0.46	0.80	0.0001
15	Rahimian Boogar and Asgharnejad Farid (2008) (42)	314	Bam	Grown-ups	CD-RISC	GHQ-28	0.95	0.84	1.06	0.001
16	Samani and Sahragard (2007) (43)	287	Shiraz	University students	CD-RISC	DASS	0.50	0.38	0.61	0.01

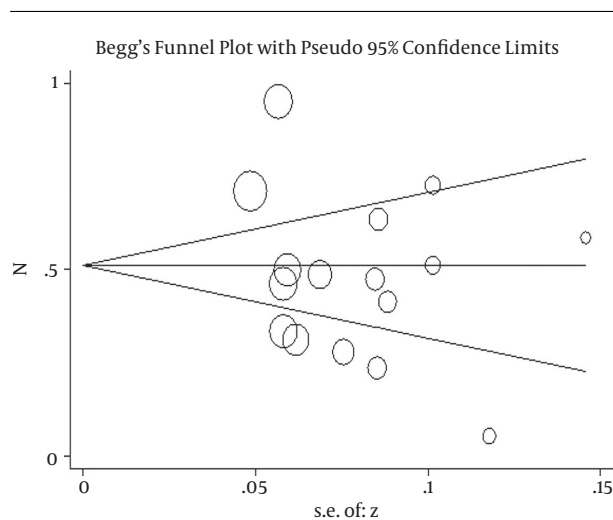
cial and contextual (protective) factors that neutralize or mitigate stressful situations (57-59). Olsson et al. (2003) considers resilience as a predictor of mental health, func-

tional capacity and social efficiency (60). Min (2013) believes that resilience is necessary to maintain or regain mental health in the face of difficulties and adversity (61).

**Table 2.** The Correlation Between Resilience and Mental Health in all the Studied Subgroups<sup>a</sup>

Variables Assessed		Number of Studies	Participants	Z	Confidence Level (95%)	Heterogeneity	
						%	P Value
Area	1	4	579	0.43	0.17 - 0.70	89.4	0.0001
	2	5	907	0.43	0.33 - 0.53	49.4	0.095
	3	1	142	0.47	0.31 - 0.64	-	-
	4	3	575	0.35	0.24 - 0.47	43.0	0.173
	5	2	740	0.83	0.59 - 1.06	90.4	0.001
	Unknown	1	214	0.48	0.35 - 0.62	-	-
Target population	Students	8	1676	0.39	0.35 - 0.45	63.7	0.011
	Others	8	1481	0.54	0.49 - 0.59	92.0	0.0001
Scale for assessment of resilience	CD-RISC	13	2645	0.51	0.47 - 0.55	88.9	0.0001
	Others	3	512	0.28	0.20 - 0.36	0.0	0.602
Scale for assessment of resilience	GHQ	11	1866	0.46	0.41 - 0.51	91	0.0001
	Others	5	1291	0.49	0.44 - 0.56	85.9	0.0001

<sup>a</sup>Area 1, Alborz, Tehran, Ghazvin, Mazandaran, Semnan, Golestan and Ghom province; area 2, Isfahan, Fars, Bushehr, Chaharmahal and Bakhtiari, Kohgiluyeh and Boyer-Ahmad and Hormozgan province; area 3, East Azerbaijan, West Azerbaijan, Ardabil, Zanjan, Gilan and Kurdistan province; area 4, Kermanshah, Ilam, Lorestan, Hamadan, Khuzestan and Markazi province; area 5: Razavi Khorasan, North Khorasan, South Khorasan, Sistan and Baluchestan, Yazd and Kerman province.

**Figure 2.** The Funnel Plot of the Analyzed Studies

Resilient people are optimistic and have a feeling of inner control in dealing with negative events of life, ultimately resulting in favorable health outcomes and improving their physical and psychological health (62, 63).

The correlation between resilience and mental health can be attributed to the relationship between protective and risk factors in individuals (64). If protective factors outnumber risk factors (factors increasing the possibility of incompatible outcomes), it is predicted that the individ-

ual, in dealing with problems, displays more resilient behavior, copes with problems, and does not experience mental health disorders (22, 65). Self-efficacy, social support, occupation, higher education, self-esteem, positive social orientation, asking for help, stress management, locus of control, coping, and older age are the most important protective factors that play a key role in the demonstration of compatible behavior and protection of mental health in difficult situations (66-75).

One of the strengths of the present study was its comprehensiveness, as all studies related to the aims of the research have been reviewed. Resilience is one of the main components of mental health, which is different in various contextual, time, and age conditions of life; and resilience can protect and improve mental health by providing proper cognitive, behavioral, and emotional responses in critical situations.

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### Footnotes

**Authors' Contribution:** Reza Ghanei Gheshlagh and Abbas Ebadi: data collection; Kian Nourozi Tabrizi: study de-

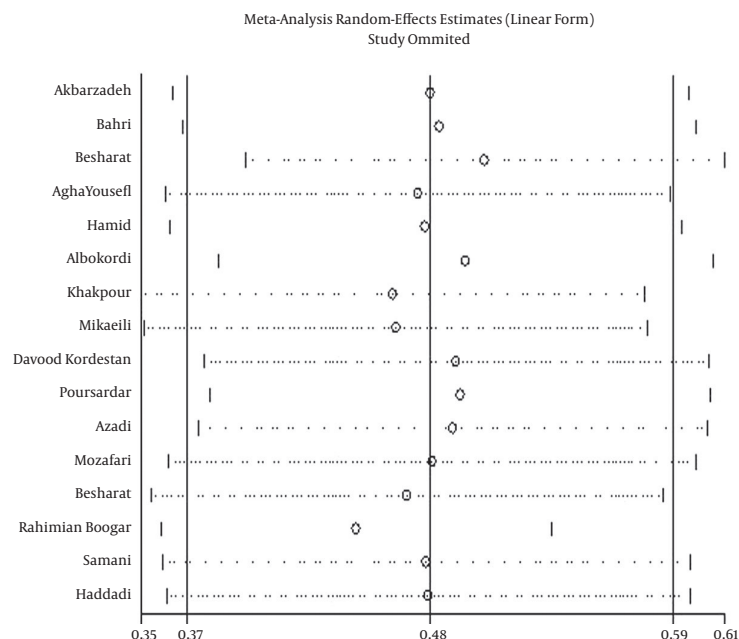


Figure 3. Sensitivity Analysis

sign; Asghar Dalvandi and Sadat Seyed Bagher Maddah: final revision and grammar editing; Kourosh Sayehmiri and Sahar Dalvand: statistical analysis.

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