

# The Effectiveness of Psychological Interventions on Suicidal Thoughts and Behaviors in Iran

## A Meta-analysis and Systematic Review (2010-2021)

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### Abstract

Suicide and suicidal behavior are critical issues in the mental and social health systems around the world. The extant study aimed at conducting a meta-analysis on previous studies carried out in the field of the effect of psychological intervention on suicidal (thoughts and behaviors) in Iran, 2010-2021. The present paper used the meta-analysis technique. The statistical population comprised previous papers, dissertations, and studies by searching through Iranian and foreign databases, such as SID, Magiran, Irandoc, Civilica, Rigest, Noormags, Google Scholar, and Ensani.ir, Scientific-Research Journals, and central libraries of universities in Iran. Overall, 40 studies were selected. Furthermore, a meta-analysis checklist was used to follow inclusion criteria and extract the required data. Finally, 26 studies were chosen, and their effect size was reported. Statistical analyses were done based on the analysis method introduced by Howitt and Cramer (2005). The obtained results indicated the combined effect size of  $E_s=0.99$  in reducing suicidal thoughts and attempts. The obtained value was greater than 0.80, which indicates a high effect size based on Cohen's Table. The combined significance level of conducted studies equaled  $P<0.00001$  showing the significant total effect size of the meta-analysis of the effectiveness of psychological interventions on suicidal (thoughts and behavior) in Iran. Psychological interventions had high effectiveness in reducing suicidal thoughts and behaviors in Iran.

**Keywords:** Meta-Analysis, Psychological Interventions, Suicide, suicide ideation, suicide attempt, Effectiveness.

### Introduction

Nowadays, suicide is one of the top ten causes of death and a critical challenge for the health system worldwide (WHO, 2018). Every year, 703000 people die by suicide. More people die because of suicide than malaria, HIV/AIDS, breast cancer, or war and homicide. More than one in every 100 deaths (1/3) was caused by suicide in 2019 (WHO, 2021). Some studies have reported the prevalence of suicide ideation as about 3-19% among normal people (de Beurs et al., 2019). An Iranian study reported lifetime prevalence rates for suicidal ideation, planning, and attempts equal to 14%, 6.6%, and 4.1% respectively (Shooshtary et al., 2008).

The reduction of deaths caused by suicide has been set as a prior global target and an index of Sustainable Development Goals (SDGs) by the WHO organization (WHO, 2021). This case has been predicted in WHO Mental Health Action Plan 2013–2030, which has been extended up to 2030 (Saxena et

al., 2014). Since suicide has been viewed as a preventable death (WHO, 2021; Naghavi, 2019), various psychological interventions have tried to affect two determinants of suicide, including suicidal ideation and attempt (Asante et al., 2017; de Azevedo Cardoso et al., 2018; López-Goñi et al., 2018). Researchers have performed many individual and group interventions regarding the importance of suicide and its effect on mental health to save time and cost. The authors have compared the effects of interventions on the reduction of suicide-related thoughts and behaviors among subjects in intervention and control groups. However, researchers have different ideas about the effectiveness of this therapeutic approach (Hofstra et al., 2020; Zalsman et al., 2016; Ougrin et al., 2015). According to the points mentioned above, the theoretical literature of the present study is more important than other single research since this paper has summarized and integrated the results of previous studies on the considered

topic. Hence, the present study helps the psychology theorists and therapists to find the effectiveness of psychological approaches. In terms of application, the extant study can reveal the effect of psychological interventions on suicidal behaviors and thoughts (ideation), and therapists can use and improve the performance of such therapies more confidently. On the other hand, if coherent results are obtained from such meta-analysis, researchers will not spend high costs and time carrying out repetitive studies in this context. Although many studies have examined the effect of these therapies on clients in group and individual cases in terms of the psychological field, there has not been any comprehensive and holistic meta-analysis to evaluate the relevant studies. Moreover, many studies have been conducted on the effect of psychological interventions on suicide in Iran; hence, a meta-analysis can reveal the actual effect size of psychological interventions on suicide in Iran. In other words, this meta-analysis can find the effectiveness of psychological interventions in reducing suicide by presenting an accurate and inclusive attitude toward the efficiency of psychological interventions in Iran. Accordingly, the present study aimed at examining the effectiveness of psychological interventions in reducing suicidal thoughts and behaviors by using a meta-analysis.

**Method**

The present study was conducted based on the meta-analysis regarding the considered objective. The statistical population comprised all research, Ph.D. and MA dissertations, and papers on the effect of psychological intervention on suicidal thoughts and behaviors in Iran, 2010-2021 published in Iranian and foreign journals over the recent 10 years. The collected papers and studies had essential conditions in terms of methodology (hypothesis building, method, population, target, sample size, sampling method, measurement instrument, validity, reliability of measurement instrument, statistical analysis, and accuracy of statistical computations).

**Instrument**

Search resources of this study included Ph.D. and MA dissertations (referring to local digital resources of library and university), scientific-research journals of psychology, educational sciences, medical sciences, the database of University Jihad, and Iran's Document Centers. The analyzed

references included an examination of the effectiveness of psychological interventions (on suicidal thoughts and behaviors), as well as Iranian papers published in international journals.

In the meta-analysis, all of the researches with eligible methodology were analyzed so that all references with inclusive criteria were used. In other words, inclusive criteria for extant meta-analysis were as follows:

- 1) Research topic was the effectiveness of psychological interventions on suicidal thoughts and behaviors in Iran.
- 2) The study was conducted based on the group method, so individual, systematic, and correlational cases were not confirmed.
- 3) Selected studies were of quasi-experimental type.
- 4) Selected studies have used precise scales and valid instruments with sufficient validity and reliability rates. A content analysis checklist was used as the research instrument. The checklist was used to select dissertations, research plans, and papers that had inclusion criteria to collect data from their content to conduct the meta-analysis. The checklist comprised some components, including the title of conducted studies, name of authors, the examined variable, sample size, statistics, statistic value, and significance level.

Meta-analysts use means, variance, SD, and statistic values to measure the effect size. However, r and d are the most common indicators that are used for correlational and group differences, respectively (Howitt & Cramer, 2011). Therefore, among 40 reviewed studies, 26 studies were confirmed based on the list of considered studies, and the aforementioned criteria. The detailed list of studies and their descriptive data have been reported in Table 1. Computations have been done manually. Meta-analysis was implemented based on the meta-analysis steps introduced by Howitt and Cramer (2011) which are as follows:

- 1) Definition of variables
- 2) search through database
- 3) assessment of researches
- 4) calculation of effect size of each study
- 5) aggregation of the effect size of studies
- 6) significance of aggregated studies

Table 1 reports the checklist of meta-analyses on the effect of psychological interventions on suicidal thoughts and behaviors in Iran, 2010-2021 based on the method introduced by Howitt and Cramer (2011).

**Table 1. Checklist of meta-analysis studies on the effect of psychological interventions on suicidal thoughts and behaviors in Iran, 2010-2021**

Row	Title	Author	Variable	Sample size	Statistical method	Statistic	Sig.	Effect size
1	Effectiveness of dialectical behavior therapy on suicide behavior in the	Alinaghi, Hatami, Salavati (2018)	Suicidal behavior	24	Mixed ANOVA	12.842	0.002	1.62

	suicidal adolescent with Borderline personality syndrome							
2	Effectiveness of emotion-focused therapy on emotional dysregulation, hopelessness, and suicidal ideation in post-traumatic stress disorder veterans	Mikaeili, Molavi, Einy, Tagavy (2017)	suicidal ideation	50	Multivariate ANCOVA	22.17	0.02	0.61
3	Effects of dialectical behavior therapy with medical therapy vs. medical therapy alone in reducing suicidal thoughts in patients with major depressive disorder and recent history of attempted suicide	Karbalaei, Ahadi, Sharifi, Jazayeri (2010)	suicidal thoughts	24	ANCOVA	34.492	0.0001	2.27
4	The effect of self-awareness training on reducing aggressive behavior, addiction, and suicide of high school girl students	Hoseinkhanzadeh, Maleki, Taher, Mojarad (2017)	Suicidal behavior	40	ANCOVA	153.70	0.001	1.09
5	Comparison of the effectiveness of mindfulness-based cognitive therapy and behavioral activation treatment for depression in reducing symptoms, improving quality of life, and decreasing suicidal thoughts in depressed individuals	Jafari, Salehi, Mohmmadkhani (2015)	Suicidal thoughts	34	Mixed ANCOVA	0.650	0.444	0.04
6	Evaluate the effect of problem-solving skills on the reduction of suicidal ideation in soldiers	Anisi, Rahmati Najarkolaei, Esmaeeli, Hagghi, (2014)	Suicidal thoughts	90	ANCOVA	4.796	0.031	0.39
7	Effectiveness of dialectical behavior therapy in reducing depression and suicidal thoughts in girl studies	Madahi & Madah (2014)	Suicide thoughts	30	ANCOVA	55.049	0.0001	1.81
8	The effectiveness of cognitive-behavioral therapy on suicidal ideation and impulsivity in adolescents addicted to drugs	Nateghi and Sohrabi (2017)	Suicidal ideation	30	Multivariate ANCOVA	21.62	0.001	1.35

9	Effectiveness of metacognitive therapy on suicidal ideation of depressed patients under medicinal treatment	Rezaie et al. (2016)	Suicidal ideation	30	Paired t-test	14.75	0.0001	1.81
10	Effectiveness of cognitive-behavioral group therapy along with family training on components associated with suicide in girls who attempted to suicide	Zemestani, Yousefi, Keshavarzi (2015)	Suicidal thoughts	18	One-way ANCOVA	38.19	0.001	2.08
11	The effect of post-suicide care in the primary health care system on the severity of suicidal ideation and recurrence	Ishaqi, Foroughi, Mahmoudian (2010)	Suicidal thoughts	74	One-way ANCOVA		0.001	0.75
12	The effectiveness of compassion-focused therapy on anxiety, depression, and suicidal thoughts in women with vitiligo	Ahmadi, Sajjadian, & Jaffari (2019)	suicidal tendency	30	ANCOVA with repeated measures	14.658	0.001	1.35
13	Study of the efficacy of "self-review method" of suicidal thoughts and anger on female delinquent adolescents	PourHosein, Ezzati, & Gholamali Lavasani, (2016)	Suicidal thoughts	25	Paired t-test	8.105	0.001	0.49
14	The effect of mindfulness-based cognitive therapy on coping strategies, depression, and suicidal ideations in students	Hajjaliani, Bahrami Ehsan, & Noferesti, (2021)	Suicidal ideations	24	Multivariate ANCOVA	99.281	0.001	1.62
15	The Effectiveness of group social work intervention in resolving the problem of reducing suicidal ideation in Qorveh City	Varmaghani, Alipour, GhaedAmini Harouni, & Javadi, (2019)	Suicidal ideation	30	ANCOVA	369.97	0.001	1.35
16	Comparison of the effectiveness of emotion regulation skills training based on the Gross Model and Linehan Model on suicidal thoughts in adolescents with borderline personality disorder	Hoseini Omam, Najafi, Makvand Hosseini, Salavati, & Rezaei (2019)	suicidal thoughts	45	ANCOVA with repeated measures	82.64	0.0005	1.32
17	The effectiveness of the cognitive-behavioral analysis system of psychotherapy (CBASP) and dialectical behavior	Begian Koleh Marzi, Karami, Momeni, and Elahi (2019)	Suicidal thoughts and motivations	48	One-way ANCOVA in MANCOVA context	144.838	0.001	0.98

	therapy based on compassion for resilience and motivations for suicide attempts in people who attempted suicide							
18	The effect of schema therapy on severity of depression and suicidal thoughts in patients with resistance to depression	Moazeni, Gholamrezai, Rezaei (2018)	Suicidal thoughts	30	Univariate ANCOVA	34.75	0.0001	1.81
19	Effectiveness of nursing preventive interventions in suicide re-attempts	Ghanbari et al. (2016)	Suicide attempt	248	Multivariate Analysis		0.011	0.28
20	Effectiveness of matrix intervention program and harm reduction training on the suicidal tendency in harmed female students from the relation	Sheikhdarani, Golparvar, & Sajadian (2020)	suicidal tendency	36	Multivariate ANCOVA	12.858	0.001	1.19
21	Effectiveness of problem-solving skills training to reduce the suicide thought of soldiers	ZAHEDI & Khedri, (2015)	suicide thought	32	One-way ANCOVA	10.3	0.001	1.28
22	Effectiveness of behavioral activation group therapy on reducing suicidal tendency and increasing self-acceptance of opiate-dependent people	Masihi & Home (2019)	suicide thoughts	30	Univariate ANCOVA	5.48	0.005	1.35
23	Comparison of the effectiveness of treatment based on acceptance, commitment, and mindfulness of the suicidal ideation of depressed women	Abyar, Makvandi, Bakhtiarpour, Naderi, and Hafezi (2018)	suicidal ideation	24	ANCOVA	8.00	0.002	1.62
24	Effectiveness of suicidal prevention program based on SOS on reducing suicidal tendencies and depression in girls	Hosseini, Jamshidi, Sedghi, Jalali, & Shamsi, (2019)	Suicidal thoughts	26	ANCOVA	46.47	0.0001	2.08
25	Effect of negative mood control training skills on suicidal ideation, anxiety, and depression among high school female students in Ilam, Iran	Amirinezhad, Ghodsy, Jamshidzadeh & Mohammadian, (2020)	suicidal ideation	60	ANCOVA	39.3	0.0001	1.09
26	Effectiveness comparison of" resilience skills training" and" positive thinking" on reducing	Salehi Shablizi & Kianian (2020)	suicidal ideation	33	Univariate ANCOVA	36.36	0.001	1.25

suicidal ideation in male university students							
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next step, all studies were combined by converting the r rate of effect to zr regarding their average computation, and then they were reconverted to effect size.

### Findings

The effect size of therapeutical patterns has been calculated based on the data presented in reports of considered research. To do so, the effect size was calculated based on the meta-analysis stages proposed by Howitt and Cramer (2011). In the

**Table 2. Results of a meta-analysis of the effect of psychological interventions on suicide (thoughts and behaviors) in Iran**

Research	Sig.	Conversion of significance level to Z	r	Cohen's d	Conversion of r to Zr
1	0.002	3.090	0.63	1.625	0.741
2	0.02	2.054	0.29	0.61	0.299
3	0.0001	3.719	0.75	2.27	0.973
4	0.001	3.090	0.48	1.09	0.523
5	0.044	0.151	0.02	0.04	0.020
6	0.031	1.881	0.19	0.39	0.192
7	0.0001	3.719	0.67	1.81	0.811
8	0.001	3.090	0.56	1.35	0.633
9	0.0001	3.719	0.67	1.81	0.811
10	0.001	3.090	0.72	2.08	0.908
11	0.001	3.090	0.35	0.75	0.365
12	0.001	3.090	0.56	1.35	0.633
13	0.001	3.090	0.61	0.49	0.709
14	0.001	3.090	0.63	1.62	0.741
15	0.001	3.090	0.56	1.35	0.633
16	0.0005	3.719	0.55	1.32	0.618
17	0.001	3.090	0.44	0.98	0.472
18	0.0001	3.719	0.67	1.81	0.811
19	0.011	2.326	0.14	0.28	0.141
20	0.001	3.090	0.51	1.19	0.563
21	0.001	3.090	0.54	1.28	0.604
22	0.0005	3.090	0.56	1.35	0.633
23	0.002	3.090	0.63	1.62	0.741
24	0.0001	3.719	0.72	2.08	0.98
25	0.001	3.090	0.48	1.09	0.523
26	0.001	3.090	0.53	1.25	0.590

Table 2 indicates the significance level, z, r, Cohen's d, and Fisher's zr rate of reviewed studies. The most important goal of a meta-analysis is the integration of findings obtained from various studies in form of a single aggregated effect size. To

do so, the average rate of effects size is measured. Table 3 indicates the results of the aggregated effect size of reviewed studies.

**Table 3. Aggregated results of the meta-analysis of the effect of psychological interventions on suicide (thoughts and behaviors) in Iran**

Number of effect size	Total Fisher's z (Zr)	Total effect size
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26	3.059	0.99
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According to Table 3, the average effect size of reviewed studies equaled 0.99. Table 4 reports the significance of integrated studies.

**Table 4. Significance of integrated studies on the effectiveness**

Number of studies	Total z value	Average z value	Aggregated sig.
26	78.10	15.31	0.00001

According to Table 4, the significant rate of integrated studies equaled  $P < 0.00001$  indicating a significant total effect size of meta-analysis of the effectiveness of psychological interventions in reducing suicidal thoughts and behaviors in Iran. Table 5 reports the interpretation of results based on the effect size of Cohen's d.

**Table 5. Interpretation of results based on the effect size of Cohen's d**

Interpretation	Cohen's d
Low effect size	0.2
Average effect size	0.5
High effect size	0.8

According to the interpretation of results obtained from reviewed studies on the effect of psychological intervention on suicide in Iran based on the effect size of Cohen's d, these interventions had a high size of the effect on reduction of suicidal thoughts and behaviors in Iran.

## Discussion

Meta-analysis provides a more inclusive viewpoint toward different variables by integrating the results of various studies conducted on numerous samples. Meta-analysis indeed examines a sample of society and different individuals by comparing results obtained from various studies. Findings of meta-analysis play a more vital role in a society like Iran where much diversity exists, and various data of different samples of the population are needed to find similarities and deal with differences by integrating these data. It is essential to find and generalize the results of various studies on the effect of

psychological intervention on suicide; hence, an extant study was carried out to examine this case. The present paper estimated an effect size of 0.99, which indicates a highly significant effect size in the interpretive evaluation of Cohen. The results of the meta-analysis showed that psychological interventions were effective therapies in reducing suicidal thoughts and attempts in Iran. Therefore, this meta-analysis confirmed the results of studies that examined the effectiveness of psychological therapies in reducing suicidal thoughts and attempts in Iran.

Findings obtained from the extant study were consistent with the results of studies conducted by Bahji et al. (2021), Bornheimer et al. (2020), Hofstra et al. (2020), Labelle, Pouliot, Janelle (2015), Tarrier, Taylor, Gooding (2008).

Bahji et al. (2021) carried out a study entitled meta-analysis and systematic review of efficacy and acceptability of psychotherapies for self-harm and suicidal behavior. They searched four major bibliographic databases (PubMed, MEDLINE PsycINFO, and Embase) for clinical trials with control conditions. The systematic search generated 1272 unique records. Of those, 44 randomized clinical trials (with 5406 participants) were selected. Cohen's effect size equaled -0.71 and -1.22 for the effect of psychological interventions on the reduction of suicidal behavior and ideation, respectively. The obtained results indicated the vital role of psychological interventions in reducing thoughts and behaviors associated with suicide.

Bornheimer et al. (2020) conducted a meta-analysis to examine the role of psychosocial interventions in suicide. In this research, eight electronic databases were systematically searched. Identified studies included controlled trials that examined the effectiveness of psychosocial interventions in suicide ideation, plan, attempt, and death. Eleven studies with 14 effect sizes were analyzed. Results of the meta-analysis in the first stage indicated that participants who received the designed psychological interventions were less likely than their counterparts, which did not receive psychological interventions, to report suicide ideation, plan, and attempt suicide. The effect size equaled 0.73 with a confidence index of 98%.

Hofstra et al. (2020) conducted another meta-analysis with the aim of a systematic review of the effectiveness of suicide prevention interventions. The papers published between 2011 and 2017 in PubMed, PsycINFO, and Cochrane databases were reviewed and considered data were extracted. In this research, 16 studies were examined. According to the obtained results, effect sizes of preventive interventions in completed and attempted suicide equaled 0.53 and 0.44, respectively at a

significance level of 0.032. This study indicated that suicide prevention interventions were effective in preventing completed and attempted suicides.

Labelle, Pouliot, and Janelle (2015) conducted a meta-analysis on 14 studies and indicated the considerable effect of early psychological interventions on reducing suicide thought (including 13 studies from 14 reviewed studies) in adolescents. The results related to suicide indicated that timely and empirically proved intervention could slow down the movement of suicide from thought to attempt.

Tarrier, Taylor, and Gooding (2008) carried out a meta-analysis to examine whether cognitive-behavioral interventions can reduce suicide behaviors. Of 123 potential articles, 28 studies met the entry criteria. Overall, there was a highly significant effect of CBT in reducing suicidal behavior. Therefore, it is necessary to know which approach to what references and under what circumstances works (Dziegielewski, 2014). In this case, meta-analysis studies contribute to this case.

### Conclusion

Finally, various cultural contexts in different societies are effective in the efficacy of many therapeutic approaches. However, various therapies are used to treat many problems, but the most important point is paying attention to the success level of application of the considered therapeutic pattern to solve the issue. Hence, it is suggested based on the results of the present study that therapists use psychological interventions or effective therapies to reduce suicidal thoughts and behaviors. The lack of fundamental and inclusive studies on suicide in addition to the effectiveness of psychological interventions in reducing suicidal thoughts and behaviors has led to the necessity of additional studies and the integration of findings obtained from these studies. Hence, the extant study was conducted to meet the aforementioned need. However, further studies must be conducted on the effectiveness and continuity of effects of psychological interventions with an emphasis on biological changes. Hence, researchers must examine the issues in a focused and scientific method. Moreover, it is recommended to carry out further meta-analyses and systematic reviews on some variables, such as disappointment that plays a vital role in moving through the suicide continuum from suicidal thought to intention.

The major limitation of meta-analysis in this research resulted from a lack of access to some papers that occurred in cases authors did not collaborate or respond; therefore, future meta-analyses must cover such comprehensiveness.

The extant study was adopted from a Ph.D. dissertation by the first author of clinical psychology at the University of Social Welfare and Rehabilitation Sciences with ethical code Ir.uswr.recl398.022. This research did not use university funds or the personal cost of the authors.

### Participants

All authors took part in this study.

### Conflict of Interest

There was no conflict of interest.

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**Human and Animal Rights and Informed Consent:**

This article does not contain any studies with human or animal subjects performed by any of the authors.

### Contributors:

All authors contributed to the preparation of this article.

### Conflict of interest:

The authors declare that they have no conflicts of interest.

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