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Research Article

Patient and Family-Centered Suicide Prevention After the First Attempt- A Systematic Review

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Abstract

Background: Previous suicide attempt is a high risk factor of new suicide attempts. Tertiary interventions aim to prevent second or repetitive attempts and to suppress suicidal behavior. Objectives: To present an overview of tertiary suicide prevention interventions and study their effectiveness, focusing on patient and family interventions.

Methodology: Systematic review was based on PRISMA checklist and produced using databases Pubmed, Scopus and Google Scholar for articles published during 2000-2018. Searching was made for patient and family- centered interventions.

Results: The Systematic review includes 11 studies that concern family and patient-centered interventions. Family-centered interventions were more effective in preventing new suicide attempts. Results generalization is limited by the inclusion of not exclusively randomized controlled trials and by the variability among study samples.

Conclusion: Patient and family-centered psychotherapeutic approaches have shown a positive effect in preventing a second suicide attempt. More studies are needed to clarify patient populations, where each intervention could be more effective.

Practical implications: Findings are important for professionals in mental healthcare, to implement suicide prevention strategies after the first attempt, based on optimal communication strategies and on the interaction between health professionals and the family.

Keywords: *Second Suicide Attempt; Prevention; Interventions; Family*

Introduction

Suicide is the act in which a person deliberately puts an end to his life [1,2]. Various conceptualframeworks have been used at times when referring to suicide, such as deliberate self-injury, self-injury, suicide attempt, self-poisoning, etc [3].

A broader term is suicidal behavior, which includes suicidal ideation (frequent thoughts of ending one's life), suicide attempt (the actual event where the individual is attempting to end one's life), and complete suicide (the suicide attempt that results in death) [4]. Suicidal behavior is always deliberate, conscious and represents intense emotions for powerful, aggressive and self-destructive acts [4].

Suicide attempt is defined as a self-inflicted, potentially injurious behavior, with a non-lethal effect, for which there is evidence (either explicit or implicit) that the individual intends to die [5].

Suicide is the second most common cause of death among people aged 15 - 29 [6], and the 20th most common cause of death in the general population [7]. In 2016 was the 2nd (for girls) or 3rd (for boys) most common cause of death among adolescents aged 15 - 19 [8].

In 17 Europeancountries, the prevalence of suicidal ideation among students aged 15 - 16 years ranged from 15% (Armenia) to 31.5% (Hungary), while the prevalence of suicide attempts ranged from 4.1% to 23,5% (in the same countries) [9]. It is estimated that for every suicide-induced death,up to 20 other people will attempt suicide [10].

Previous suicide attempts are the strongest risk factor for a new suicide attempt, suicide death,development of recurrent suicide behavior, and development of suicidal ideation in the generalpopulation [11-14].

The risk of a second attempt is greater in the period immediately following the first attempt [3] and mainly during the first two years after the first attempt [13]. One of the first in-depth reviews on this issue estimated that people with prior self-injury were 25 times more likely todie by suicide than the general population [15].

Young age, mental health problems, gender, and a history of alcohol use are important risk factors for a second suicide attempt [13,16,17]. Other researchers have also emphasized the role of personality disorders, in particular personality borderline disorder, in its association with subsequent suicide attempts [18].

A person's suicide has a significant impact on society. Social costs are very important and areprimarily related to the emotional distress in the family and the intimate environment of the person attempting suicide [19]. Suicide death affects the internal structure of the family unit and therefore threatens family stability [20-22].

Parent-or-family-focused interventions can also be effective, especially in adolescents with suicidal ideation. Pineda and Dadds [23] investigated the efficacy of a psychoeducational program in parents of 48 adolescent suicidal ideates. The risk of a new attempt was assessed at3 and 6 months after the end of the intervention. The results of the study showed high intake and retention, greater improvement in family functioning and greater reduction in suicidal behavior of adolescents in the intervention group compared to the control group.

Group psychotherapy is also an integrated treatment approach that includes dialectical behavioral and cognitive behavioral techniques, which has also been explored for theireffectiveness in preventing suicidal behavior.

Attachment-based family therapy (ABFT) has also been described as a potential treatment forpeople with a history of suicide. ABFT has evolved and emerged through interpersonal theoriessuggesting that depression and suicide can be exacerbated or avoided through improved qualityof family relationships. Therefore, ABFT focuses on reinforcing family bonding to create a protective and secure base for adolescent development. The treatment begins with a discussionwith the teenager about the factors that prevent him from turning to his family for help when thinking of committing suicide. Family barriers include: a) adolescent anxiety due to depression, b) history of negative interactions and communication, c) abuse, neglect, abandonment and / or d) parental psychopathology. Even in positive families, help is needed to effectively manage adolescent suicide attacks [24].

Although ABFT therapists implement behavior-focused interventions and psychoeducational interventions, the model is primarily an emotion-driven process guided by a semi-structured treatment protocol. The treatment consists of five specific stages, each with a separateprocedure and goal [24].

Parental psycho-education can also be an important approach to suicide prevention after the first attempt. Such an approach studied in the literature is the Resourceful Adolescent Parent Program (RAP-P). Psychoeducation is provided to parents of adolescents aged 12 to 17 years and is designed to help parents create a strong and compassionate family environment that canhelp promote the healthy development of adolescents who have previously attempted suicide.RAP-P is designed to help parents build their confidence and thus positively influence their children to increase their self-esteem. In addition, it seeks to help participants manage negativeemotions for themselves and their children and to create a supportive home environment [25,26].

Developing suicide prevention plans within the family can be considered a broader approach to suicide prevention. In practice this includes promoting communication within the family andreceiving psychological counseling and/or psychiatric treatment from the person attempting to commit suicide [27]

In general, both individual as well as group and family interventions are potential treatment options for each patient. The family can become involved in the intervention's goal by receivingtraining in the signs that may indicate suicidal behavior [28].

In the context of the importance of the family's role in suicide prevention, after the first attempt,the collaboration of professionals, especially in the field of mental health with family members,the wider social environment of the individual and caregivers, is an important part of care provided to the person who attempted to commit suicide [29,30]. The way mental health professionals communicate with family and caregivers has been shown to have a profound impact on the way prevention is implemented [31,32].

In this context, well-documented and effective interventions play a key role in suicideprevention and must be implemented within a multi-faceted approach that reflects the complexnature of suicide and self-injury behavior [33].

Material And Method

Research Strategy and study eligibility The review was conducted and reported in accordance to the preferred reporting items for systematic reviews and meta-analysis (PRISMA) statement (Appendix A).

Section/topic	#	Checklist item
TITLE		
Title	1	Identify the report as a systematic review, meta-analysis, or both.
ABSTRACT		
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.
INTRODUCTION		
Rationale	3	Describe the rationale for the review in the context of what is already known.
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).
METHODS		
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.

Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.
RESULTS		
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).
DISCUSSION		
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.
FUNDING		
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.

APPENDIX A

This review includes articles reporting on patients (female or male) with history of at least oneprevious suicide attempt, published from 2000 to 2018 in English. There are no age restrictionsin this review, or other demographic limitations, or restrictions regarding the type of the preventive intervention. Studies regarding interventions on patients with no history of previoussuicide attempt were excluded from the review. Also, studies including interventions about physical treatment of the patients as a result of suicide attempt were excluded.

The PubMed, Scopus and Google Scholar databases were searched, from 23 November 2018 to 23 December 2018 with the following keywords: (suicid* OR deliberate self-harm* OR self-injur* OR suicidal behavio*) AND (re-attempt* OR multiple OR second OR repeat* OR recurren*) AND (patient OR family) AND (intervention* OR psychological intervention*). Inaddition, forward citation and reverse citation tracking were conducted for the articles. 908 articles were found in PubMed and Scopus databases and 116 in Google Scholar database. Thesearch strategy was presented in figure 1.

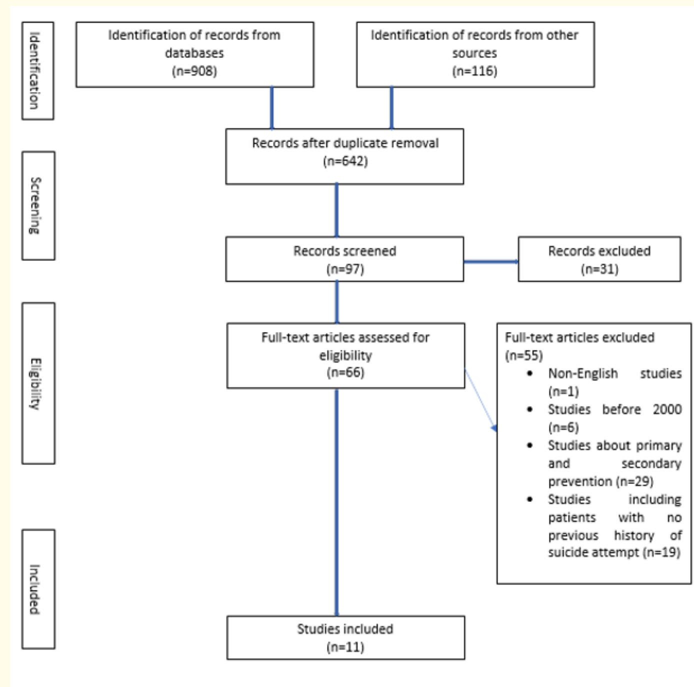

Figure 1: *Preferred Reporting Items for Systematic Review flowchart about the family- and patient- centered interventions for the prevention of suicide after the first attempt.*

Results

The research brought 11 studies regarding the interventions for predicting suicide after the firstattempt, based on family and patient. The classification of these studies according to their methodology showed that they consist of: 3 randomized controlled trials, 1 systematic reviewand meta-analysis study, 1 systematic review, 1 meta-analysis, 2 semi-experimental studies, 2literature reviews and 1 pilot study. Based on these 11 articles the implemented interventions for family and patient were: 1) Cognitive Behavioral Therapy with the participation of the parents [34], 2) therapy which is based on the attachment to the family [24], 3) the developmentof a suicide prevention plan within the family [27], 4) family therapy [35], 5) interactive psychoeducation of the parents [23] and 6) patient-centered psychotherapies [7,36,37]. The results of the randomized controlled trials are presented in table 1.

Study	Sample(I, C)	Intervention	Duration	PrimaryOut-come Measure	Results	Long-Term Moni-toring
Cottrell.,*et al* (2018)	832 (415,417)	FTI	6 months	Admission tohos-pital for anew at-tempt (self-report from the teenager or the parents)	The numbersof hospital admis-sions for recurrent self-injury events were not sig-nificantly different between the two groups (28% in the intervention group and 25% in the control group) (p = 0.33)	-

Diamond.,*et al* (2010)	66 (35,31)	AFBT	3 months	Suicidal ideation (SIQ-JR23 and SSI) Depression(BDI-II)	Adolescentstreated withAFBT showed a significantly greater and faster decrease in suicidal ideation during treatment (p = 0.003) and marginally a significant reduction in depressive symptoms compared to the control group (p = 0.004).	Improvements in suicidal ideation were maintained after 12 weeks of treatment (p = 0.004), but the improvements in depressive symptoms were not maintained
Pinedaand Dadds(2013)	48 familiesand their children(24,24)	RAP-P	3 months	Suicide Ideation (ASQ-R) Psychologicaladjustment (SDQ) Psychological health (HoNOSCA)	Adolescents in the control group showed improvementsin all primary outcome measures (ASQ-R:p < 0.001, SDQ: p < 0.05 HoNOSCA:p < 0.05).	Improvements were maintained in all measures after 3 months from the end of the treatment (p < 0.05)

Table 1: *II: Summary of the findings of randomized controlled trials regarding family andpatient centered interventions for the prevention of suicide after the first attemptI: Intervention Group, C: Control Group.*

In the first study Diamond and associates researched the effectiveness of the therapy that is based on the attachment to the family (AFBT). In this study they participated 66 teenagers, who were randomized into two groups: the intervention group (n = 35) which received therapyfor 12 weeks, based on the attachment to the family and the control group (n = 31) which received the usual care (frequent telephone surveillance). The results showed that the teenagersfrom the intervention group, presented bigger and faster reduction of the suicide ideation duringtherapy. The same effect was observed, also, during the evaluation (24 weeks). Furthermore, the patients from the intervention group showed a marginally significant reduction in depressive symptoms compared to the control group at the end of the intervention, a differencethat was not maintained in the long-term follow up.

In another study, Pineda and Dadds evaluated the benefits of a combined interactive parentingprogram (Resourceful Adolescent Parent Program (RAP-P)) and the provision of routine care,compared to the provision of only routine care, in the reduction of suicide ideation

and depressive symptoms. The families were divided into two groups. In the first group (n = 24 families with their children) the program RAP-P was provided to parents and the children received the routine care. In the control group (n = 24 families and their children), parents did not receive any intervention and the kids received only the usual care. The routine care includedwhatever intervention was considered appropriate. The intervention program included the implementation of crisis management and home security plans, the provision of individual psychoeducation, non-specialist counseling, supportive therapy, cognitive behavior therapy and pharmacological treatment. The routine care included crisis management and safety planning at home. The meetings in the intervention group were performed at home or at a healthunit (depending on the family's choice). Results showed that in the control group, no improvements were observed in any of the primary outcome measures throughout the study, as opposed to the intervention group, where participants showed significant improvements bothin the evaluation at the end of the intervention and in the long-term evaluation. The evaluationswere improved for both groups after the end of the intervention, but the intervention group presented bigger improvement. These results indicate that RAP-P was associated with a greaterimprovement in family functioning and a greater reduction in adolescent suicidal behavior, compared to the provision of usual care alone. The benefits were maintained during the long- term follow-up for the intervention team. Changes in adolescent suicide were largely influenced by changes in family functioning.

Cottrell in a multicenter, randomized, controlled trial, investigated the efficacy of a family- centered treatment, compared to usual care, in adolescents with at least two previous suicide attempts and mental health problems [35]. Participants were randomly assigned to two groups,where patients in the intervention group received family therapy (415 patients) and the controlgroup received usual care (417 patients). The results of the study initially showed that the numbers of hospital admissions for recurrent self-injury incidents were not significantly different between the two groups. No statistically significant differences were found between the groups, regarding the levels of depression, quality of life, and family functioning. Overall,this study did not find that the treatment applied could be effective in preventing suicide after the first attempt.

The effectiveness of an intervention can also be judged in terms of its acceptance by the patient.This efficacy parameter was evaluated in a single study, which was identified when searchingfor systematic review studies. Stanley., *et al* [34], through a questionnaire distributed to patientsand their families, recorded patients' views on cognitive behavioral therapy with family involvement. All patients (100%) reported that the treatment was helpful. 42% said they wouldnot make any change to any aspect of treatment. However, there were patients who suggestedsome changes in treatment, such as the use of a reward system to increase motivation, the shorter duration of treatment, not to be videotaped during sessions, to add interactive activitiesfor younger adolescents, etc. 20% also said that their relationship with the therapist was a veryimportant reason that enhanced their satisfaction with the treatment. 69% reported experiencingsuicidal tendencies during treatment.

Cho., *et al* [27] investigated the existence of suicide prevention plans within the family. The purpose of the research was to determine how often families develop a suicide prevention plan,as well as the type of these plans. Based on the presence or absence of a family suicide prevention plan, the researchers compared 50 families divided into 2 groups: the first group (31 families) used a suicide prevention plan after the first suicide attempt on a member, and the second group had not established a corresponding plan.The most commonly used strategy to avoid a new suicide attempt was to promote communication between family members, seek psychological counseling and/or psychiatric treatment. The financial burden of medical care following a suicide attempt did not affect the creation of a family suicide prevention plan.

In a semi-experimental study, the researchers investigated the effect of an integrated individualand family therapy (Intensive Contextual Treatment), on the recurrence of a new suicide attempt and on the increased functional adjustment, among 40 adolescents with a history of prior self-injury and on their families [38]. Self-reports were used to extract the primary outcome measures, which were self-injury rates, suicide attempts, self-injury hospitalization, perceived stress, and emotional regulation. After the intervention, the results showed significant reductions in self-injury rates ($p = 0.001$) and in self-reported suicide attempts ($p < .0001$). The days of parental care for

inpatient/clinical care were also reduced. In addition, functional adjustment was improved and adolescents reported less criticism, while parents reported less emotional overload. Results were maintained over a 12-month follow-up. However, the conclusions that can be drawn from this study are limited due to its methodological weaknesses.

In this phase of research, were also identified 1 systematic review and meta-analysis [36], 1 systematic review [37] and 1 meta-analysis [7]. In the first study the effectiveness of psychological and psychosocial interventions in reducing recurrent adult self-injury was investigated in a systematic review and meta-analysis. The surveys included in the systematicreview and meta-analysis were 36, covering the years 1999 - 2016 and included 7,354 participants. The interventions included problem-focused therapies (including problem solving therapy), cognitive-behavioral therapy (which included various combinations of psychotherapy) and psychodynamic interpersonal, psychological psychosocial therapy, home visits and follow-up. The interventions that were found to be most effective were cognitive behavioral therapy with the family, dialectical behavioral therapy, and psychodynamic interpersonal therapy, which is now considered the most promising.

The researchers in the systematic review, investigated the effectiveness of interventions provided to patients in emergency departments after suicide attempt [7]. The systematic reviewincluded a total of 24 studies that had been published by 2013 and the primary outcome measure in all studies was the new suicide attempt. The studies were sorted by type of intervention. More specifically, 11 of them concerned maintaining contact with the patient and9 concerned psychotherapy, 1 pharmacotherapy, and 3 concerned “other” interventions. Active contact and follow-up interventions were effective in preventing suicide recurrence within 12 months (n = 5,319 participants), however, the positive effect was not maintained at 24 months.Psychotherapy approaches included problem-solving interventions, psychodynamic interpersonal therapy, behavioral cognitive therapy, dialectical behavioral therapy, and cognitive therapy. Many of these studies focused solely on changes in psychometric outcomesand did not examine suicide deaths and recurrent suicide attempts, so that no accurate conclusion can be drawn as to their overall effectiveness.

Iyengar., *et al*. in a systematic review of randomized controlled trials, investigated therapeutic interventions that were effective in reducing self-injury incidence, while also examining the effect on reducing suicidal ideation and depressive symptoms [37]. A total of 21 studies were investigated, which had been carried out until October 2017, focusing primarily on evaluatingtherapeutic interventions to reduce self-injury. In total, 18 different therapeutic interventions were identified in all studies. Five studies found a significant positive effect on the primary outcome measures, which were self-injury and new suicide attempts (31.3%). An additional 5studies showed a significant effect on secondary outcome measures, suicidal ideation and depressive symptoms (29.4%). Among the psychotherapies investigated, cognitive behavioraltherapy and its variants, as well as dialectical behavioral therapy with family involvement in adolescents, were the only interventions that showed a repeated positive effect on reducing self-injury in adolescents.

Frey and Hunt in a systematic review focused exclusively on family-focused preventive interventions [39]. Through an extensive search of online databases and using a comprehensivesearch strategy, 16 studies, published from 1996 to 2015, were identified, of which 13 examined family-centered interventions to treat suicidal ideation and behavior. Three of the studies showed a statistically significant effect on decreasing suicidal ideation, active suicidalbehavior, and suicide attempts. These positive effects were maintained during the 3-month follow-up after the end of treatment.

Finally, Wharff., *et al*, in a pilot study, described the effects of a Family Crisis Intervention (FBCI) on suicidal adolescents and their families in a large pediatric health center [40]. This intervention was designed to sufficiently stabilize patients within a single visit so that they could return safely to their families. The study involved 67 adolescents, and the results were evaluated, with those obtained retroactively from a control group (N = 150). Patients who received the intervention were less likely to be hospitalized again because of a new attempt than those in the control group (36% vs. 55%). Only two of the patients who received the intervention were hospitalized immediately after the intervention.

Discussion

The present systematic review is the first in Greece which evaluates the effect of interventions,based on family, on the prevention of suicide attempts after the first attempt. The Randomizedcontrolled trials, found through the research, investigated family- and patient-centered interventions, such as parental cognitive behavioral therapy [34], family-based attachment therapy [24], project design for suicide prevention within the family [27], interactive parentingpsychoeducation [23] and a number of other family and patient focused interventions [7,23,35-37]. Overall, the results of the three randomized controlled trials indicate that family-centered therapies may be effective in preventing suicide after the first attempt,however in a large multicenter study, this efficacy has not been demonstrated [35]. This meansthat some family-centered interventions may be more effective than others, but may also indicate differences in sample characteristics in each study. The interventions described in thethree surveys are different, as were the tools used to evaluate outcome measures, creating difficulties in comparing studies. In all studies, however, patients had co-existing psychiatric problems, with significant variability between them, which may justify the differences in the results obtained from the studies. To sum up, their results suggest that active contact and follow-up interventions, as well as some types of family-based psychotherapy, reduce the riskof a new suicide attempt in people with a previous history, with some studies finding long-termefficacy. In particular, family-centered interventions appear to be promising.

Cognitive behavioral therapy seems to be an effective treatment for teenagers with suicidal ideation who have already attempted suicide. The treatment was acceptable and was consideredeffective by the patients themselves [34]. However in this study, aspects of treatment were indicated by patients that would like to be different. These aspects, as stated by patients, needto be investigated in the future as to whether they could further improve the outcome of treatment.

Family-based treatment also showed good efficacy in reducing suicidal ideation in adolescentswith at least one previous attempt, which was maintained over the long term. However, this approach did not significantly improve patients' depressive symptoms [24]. The approach hasbeen poorly studied, and therefore more research is needed to prove its effectiveness. However,the context in which it is formulated and delivered makes it an appropriate treatment for adolescents with suicidal ideation, where risk factors are related to family functioning. In sucha case, one approach that could also work effectively is to provide interactive psycho-educationto parents, as it has been shown to improve family functioning and thereby reduce the risk of anew suicide attempt, even in the long term [23].

In general, family-centered therapies are important approaches to suicide prevention after the first attempt, because family cohesion, emotional support, and appropriate supervision are protective factors in suicide prevention and depression, especially in adolescents. However, their implementation can be a challenge, as it is well known that negative family functioning (eg, frequent conflicts, low cohesion, poor commitment, ineffective parental care, etc.) is a strong risk factor for suicide attempts among young people. Family conflicts can precede in the 20% of suicide deaths and often mitigate the effect a treatment could have [34].

To this end, family-centered treatments need to take into account the history of negative familyfunctioning of patients receiving the intervention. Possibly in cases of negative family function,approaches such as family-based attachment therapy might be more appropriate. This indicatesthe need for further research to compare the efficacy of the different family-centered preventive approaches.

In addition to receiving psychotherapy, family members of those who attempted suicide shouldwork together to promote communication within the family, and in particular communication between the patient and his or her family. Communication can be important because it can help the family understand the risk factors to help the person who attempted suicide. Cho and associates [27] have shown that financial problems do not affect the family in encouraging thepatient to seek and receive help for suicidal ideation and mental illness.

However, what is challenging in this case is the extent to which suicide attempts affect the family at a social level. People who have attempted suicide attract attention, especially in closed societies, and in addition to burdening the family with the financial cost of

treatment, relatives may feel guilty or ashamed of a family history of suicide or attempted suicide. The consequences of an unsuccessful suicide attempt can be multiple, depending on one's culturaland financial background, and the situation may worsen or improve as time goes on. The socialimpact can be even greater for people with multiple suicide attempts. Possibly, a person's persistent attempts to commit suicide reduce the tolerance of family members to the problem and create a family environment that is not supportive of the patient. This highlights the importance of family involvement in patient treatment [27].

Limitations

There were certain limitations on this study. Firstly, a major challenge was the research for articles that was based on the terms for suicide. There were plenty of terms regarding suicide and suicide attempt, and the present review adopted the definition of Silverman [5], but in thesearch strategy were included, also, the terms of other researchers. Furthermore, there were different criteria in these articles for the disassociation of suicide attempt and self-injury attempt [41]. These studies were not excluded from the review because the patients were, afterall, intended to die.

Certain limitation was, also, the methodology of the studies that were included in this review.Although, the majority of the studies were randomized controlled trials (47%), there were, also,semi-experimental studies, meta-analysis reviews, literature reviews etc. and this means a great risk of bias in their results. Only RCTs should have been included in the review but the use of the other studies gave a more integrated approach.

Another limitation of the study is the groups of patients investigated in each study. Whenlooking at the systematic review studies, there were no restrictions on the demographics of thepatients who received the intervention. Therefore, studies include interventions performed ona wide range of patients, such as adolescents, as well as older patients. Consequently, the resultscannot be generalized to the general population at high risk of a new suicide attempt, as it isvery likely that some interventions that may be more effective in adolescents may, on the otherhand, not work well for adult patients and the opposite. In this context, it is necessary for futureresearch on the same topic to investigate separately the interventions delivered to differentpatient groups, in order to be clearer which intervention can work best in each patient group. Another significant limitation is the fact that all family-centered interventions were performedon adolescents in all studies included in this systematic review. This does not allow us to draw any conclusions about how effective these interventions could be for other patients of differentages. Certainly adolescents are an important group of interest in the context of the subject beingstudied, justifying the great interest of scientific research in these population. However, futureresearch is needed to investigate the effectiveness of these interventions on people of other agegroups.

Future Recommendations

Although this systematic review has shown the efficacy of some family-centered interventionsto reduce the risk of a new suicide attempt, a large, qualitative and randomized controlled trialis needed to confirm our findings. In addition, the long-term impact of interventions is not welldocumented. Where a long-term effect is not demonstrated, further studies are needed to develop a new intervention to reduce the long-term risk of a recurrent suicide attempt.

Also, many studies did not measure or report adherence to intervention, although some hypothesized that increased adherence to intervention is a key process for suicide prevention. On the other hand, the heterogeneity of the studies included in this review makes it difficult totake into account additional factors influencing outcomes, including adherence to treatment, mental health histories, and psychiatric comorbidities.

Although, the present systematic review showed the effectiveness of certain interventions, there is still space for future researchers to evaluate the cost- effectiveness status of these interventions. Many of the therapies are completed in a short period of time, while others

needmore time to achieve their goals, and as a result they demand a bigger cost from the patients. This may be a limiting factor for some groups of patients to keep up with the therapies, especially for those with depressive symptoms.

Research is also needed for the study of the proper intension and duration of each intervention.

Conclusion

Since suicide-induced death is a major public health problem, this systematic review investigated the positive impact of suicide preventive interventions after the first attempt. Approaches based on family involvement in treatment may be effective, but it is unknown which approach may work best for each patient. Psychotherapy is a traditional and well- documented intervention for suicide prevention and the extent of family involvement in treatment should be investigated based on family history and the needs of the patient.

More studies are needed to investigate the efficacy of different treatment approaches, their appropriate characteristics (intensity, duration, etc.), and the patient groups in which they can be most effective. The findings may be important in future clinical policy-making to prevent recurrent suicidal behavior.

Disclosure

Mrs Katsivarda reports no financial relationship with commercial interests.

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