anales de psicología, 2014, vol. 30, nº 3 (octubre), 952-963
http://dx.doi.org/10.6018/analesps.30.3.148691

ISSN edición impresa: 0212-9728. ISSN edición web (http://revistas.um.es/analesps): 1695-2294

Prevention, assessment and treatment of suicidal behavior

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Título: Prevención, evaluación y tratamiento de la conducta suicida.
Resumen: El suicidio es un grave problema de salud pública mundial, tanto en países desarrollados como en vías de desarrollo. Los resultados de las investigaciones analizadas muestran que en Europa muere una persona cada nueve minutos debido a esta causa y que, actualmente, en España el suicidio es la primera causa de muerte externa por encima de los accidentes de tráfico. Se presenta una revisión de las últimas conclusiones sobre acciones eficaces de prevención del suicidio en población normal, así como los instrumentos más adecuados para evaluar el nivel de riesgo para cometer una conducta suicida en población clínica. También se ofrecen los tratamientos, que la literatura científica, ha detectado más eficaces en la lucha contra el suicidio. Se discuten los resultados más destacados en la prevención y tratamiento del suicidio, y también se plantean diversas limitaciones de este estudio, que podrían ser consideradas líneas futuras de investigación para profesionales e investigadores interesados en esta temática.
Palabras clave: suicidio; prevención; evaluación; tratamiento.

Abstract: Suicide is a serious global public health problem in both developed and developing countries. The results of the research reviewed here reveal that, in Europe, one person dies by suicide every nine minutes, and that in Spain it is currently the leading external cause of death after road traffic accidents. This review presents the latest findings on effective suicide prevention strategies in the general population as well as the most appropriate instruments for assessing the level of risk for suicidal behavior in a clinical population. The treatments that scientific literature reports to be most effective in the fight against suicide are also included. The most significant results in terms of both prevention and treatment are discussed and several limitations to this study are also raised, which may be considered for future work by practitioners and researchers interested in this field.
Key words: suicide; prevention; assessment; treatment.

Introduction

Around a million people die by suicide annually, making it one of the three leading causes of death worldwide (Fleischmann, 2008; World Health Organization-WHO, 2012). This equates to one death every 40 seconds (every 9 minutes in Europe) (Linehan, 2008; Hawton et al., 1998; WHO-Europe, 2008; WHO, 2010), resulting in considerable emotional cost to the family and friends of the person who has taken their own life. Furthermore, in almost 90% of these cases, the individual has suffered from some kind of mental disorder (World Federation for Mental Health-WFMH, 2006) or attended a medical consultation in the six months prior to the suicide attempt (World Health Organization-International Association for Suicide Prevention-WHO-IASP, 2008; WHO, 2012). In some European countries, for example, Spain, recently published data reveal that death associated with suicide is seen as the number one external cause of death, ahead of road traffic accidents (Instituto Nacional de Estadística (National Institute of Statistics)-INE, 2011). As can be deduced from these figures, suicide is a problem that needs to be addressed in all public health policies (Sánchez-Teruel, 2010). However, to date, very few countries around the world view suicide as a behavior that should be prevented, assessed and treated in a specific and particular way (Sánchez-Teruel, 2012).

Suicide prevention

Although recent studies (Fleischmann, 2008; International Association for Suicide Prevention-IASP, 2008; Organización Mundial de la Salud-OMS, 2006) conclude that suicide prevention is indeed possible, most countries lack specific strategies to tackle this behavior. The reasons for this situation are determined by a lack of awareness of suicide as a health problem, given that many societies still consider it a taboo to openly discuss this topic, meaning that the mortality statistics for suicide are not reliable outcome measures (Pritchard and Amanullah, 2007). However, it is true that in the last decade or so some international organizations (OMS, 2002; IASP; 2008; WHO, 2012) have started working alongside the governments of certain countries to ensure that this behavior is no longer stigmatized, criminalized or penalized, as well as to draw up prevention programs aimed at reducing suicide rates (Chávez-Hernández, 2008; Callard, 2008; Fleischmann, 2008; Gould and Kramer, 2001). In fact, only a handful of countries like Australia, Japan, the United Kingdom and the Netherlands have included suicide prevention among their national health priorities.

But what do we understand by suicide prevention programs? Some institutions (Spanish Confederation of Associations of Families and People with Mental Illness-FEAFES, 2006) define them as actions that include detection and intervention in at-risk populations (Muñagorri and Peñalver, 2008), together with extensive training programs for primary care practitioners, other professionals (in a school, social services, business environment) and non-professional agents who are capable of intervening when it comes to acknowledging the problem. A key example of the latter (involvement of non-professionals) is a program carried out in Panama that addresses the early detection and prevention of depression (Pan American Health Organization-PAHO, 2005), and which boasts the collaboration of the hairdressing community, with hair salons being a place where mood disorders are most easily detected.

The World Health Organization (Organización Mundial de la Salud, 2006), alongside other institutions (International

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Association for Suicide Prevention-IASP, 2008), have published numerous reports that can serve as reference for suicide prevention. What's more, the ongoing research into this issue produces results that the WHO usually transfers to national governments of those countries where behaviors of this type are highly prevalent. An innovative example (Fleischmann, 2008) was the introduction of suicide prevention projects in China and Southeast Asia in early 2008. These initiatives mainly focused on preventing self-poisoning with pesticides, which accounts for 60% of suicides in many rural areas of these countries.

It is therefore clear that one of the key functions of the WHO is to build political commitment with national governments to develop contextualized responses to suicide prevention, as well as adapt strategies necessary for preventing these behaviors on a local level and make significant headway in preventing this public health problem on a global scale (Fleischmann, 2008). The celebration of World Suicide Prevention Day in 2008 whose theme was "Think Globally, Plan Nationally, Act Locally" is an example of this (IASP, 2008).

With regard to Europe, in January 2005 ministers of health from across the 25 (now 27) EU Member States met in Helsinki (Finland) to agree on an action plan concerning mental health until 2013, which would highlight measures to promote and prevent diseases like suicide, and which was included in a document of good intentions called a "consensus paper" (Wahlbeck and Mäkinen, 2008). The purpose of this plan was to increase the budget allocation for mental health from the current 4% of the total health budget to 10% for the whole European Union (Casals, 2006).

In 2006, 59.000 people from across the EU states committed suicide, an alarming figure that, two years later, surely contributed towards suicide prevention being considered one of the five priorities of the "European Pact for Mental Health and Well-being" which was approved in Brussels in June 2008 by the 25 member states of the European Union (WHO-EUROPE, 2008), and which based on the White Paper "Together for Health: A Strategic Approach for the EU 2008-2013" developed a joint strategy for the 25 EU countries on mental health (Commission of the European Communities-(Comisión de las Comunidades Europeas), 2007). Europe boasts a number of notable examples of programs dedicated to suicide prevention, such as the one followed in Great Britain which combines specific training for primary care doctors in the acknowledgment and treatment of depression, or another which changed the gas composition (less toxic compounds) in household kitchens, as the inhalation of domestic gas was a frequent method of suicide (Department of Health, 2002). More recently, suicide prevention programs yielding very positive results were carried out in Germany and Finland (STAKES, 2005; Nuremberg, 2008; Wahlbeck and Mäkinen, 2008). Another case closer to home originates in the Autonomous Region of Andalusia; rather than focusing on suicide prevention, this initiative deals with best practices in the fight against social stigma and the proper treatment of mental illnesses in the media. The campaign was held in October 2008 under the title "1in4- Admit it- Mental health matters" (Junta de Andalucía, 2008).

Many conclusions can be drawn from these national and international experiences, most notably the importance of suicidal behavior prevention programs aimed at raising awareness in the general population (relevant information, addressing the stigma - shame, fear of rejection – associated with mental health problems), and the need for greater participation from professional and non-professional groups and individuals, politicians, and senior staff from public administrations, social services and the health care sector (Confederación Española de Agrupaciones de Familiares y Personas con Enfermedad Mental (Spanish Confederation of Associations of Families and People with Mental Illness) - FEAFES, 2006; IASP, 2008).

A considerable amount of scientific studies are available which show that suicide is the result of complex interactions between different risk and protective factors (Mościcki et al., 1988; Gould and Kramer, 2001; Sánchez-Teruel, 2012; Villardón, 1993). This research suggests that a wide range of preventive activities be implemented, focusing on the interaction of these risk factors to possibly achieve a reduction in suicide rates among at-risk groups in the long term. That said, some authors have previously expressed the need to develop a conceptual framework or model when planning and establishing national and regional suicide prevention strategies (Guo and Harstall, 2004). However, it would seem that the planning of specific models of suicidal behavior is no easy task, as the variety of public health models relating to prevention applies better to causality and the transmission of the illness, and not so much to multifactorial behaviors like suicide (Silverman and Maris, 1995; Singh and Jenkins, 2002). Nevertheless, various research projects (OMS, 2006; Pascual, Villena, Morena, Téllez and López, 2005; WHO, 2010, 2012) on suicide prevention agree on the following approaches:

- Educational suicide prevention programs in schools (OMS, 2006; WHO, 2010) can help teaching staff to learn to identify those students with suicidal thoughts and ideation as well as enable their classmates to become aware of how they can help their peers if at risk (Evans, Hawton and Rodham, 2005). Community-led programs that promote positive mental health are also useful when it comes to suicide prevention, as are suicide crisis centers and free phone helplines which are of paramount importance in suicide prevention efforts in some communities.
- The need to implement suicide prevention programs in high-risk populations (young people aged between 16 and 35 and people aged over 50) (Britton et al., 2008; Gould and Kramer, 2001; Russell and Joyner, 2001; Ryan and Futterman, 1997). In addition, the efficacy of suicide prevention programs according to sex has been demonstrated in various investigations (Gunnell, 2000; Gutiér-

rez et al., 2006; Gutiérrez and Molina, 1996; Rich, Kirkpatrick-Smith and Bonner, 1992; Rosenbaum, Baraff and Berk, 2008; Stack, 1998; Zonda, 2006), which found that, generally speaking, men are usually less receptive to health-based prevention programs, whereas women tend to use mental health facilities more frequently (emotional support services, mental health centers) (Overholser et al., 1989; Spirito et al., 1988 all cited in Gould and Kramer, 2001). Thus, these two variables (sex and age) should be taken into account to increase the efficacy of proposed prevention programs.

- Evaluating the efficacy of prevention programs also poses a significant challenge, as it is necessary to identify which specific features of these programs are the most effective, especially when taking into account that the aim is to prevent particular suicidal behaviors: ideation, self-harm, suicide attempt and completed suicide (Gould and Kramer, 2001).
- When dealing with the prevention of suicidal behavior, the most difficult task to carry out is primary prevention, mainly because this refers to groups of people who have yet to exhibit any signs of psychological distress, least of all suicidal behavior, or those whose symptomatology of psychological disorders is not at all clear (OMS, 2006). Along these lines, it has been established that the invisibility of suicide in health policies cannot be justified based on the fear that this behavior may be imitated (Johnson et al., 2011).

A final remark is that suicide prevention is a reality: prevention programs related to this behavior are feasible and should focus on maintaining and increasing proper functioning in a wide range of interpersonal and social contexts, as well as on diminishing the conditions of biopsychosocial and cultural vulnerability associated with suicidality (OMS, 2006; WHO, 2012).

Instruments for assessing suicidal behavior

In any scientific discipline it is of vital importance to be able to rely on measuring tools that can quantify, with precision, the attributes of the variables they measure (Aliaga et al., 2006). The task of measuring efficacy is determined by the psychometric properties that characterize the measures used. Thus, it is important to know the reliability, validity and other attributes in their different dimensions that the tools used to assess suicidal behavior possess. Based on this premise, a constant review of these instruments (Bunge, 1969) is a key factor in establishing quality in the measurements they provide; it is for this reason that the present section addresses a number of features, for example, their typology. From the perspective of measurement and assessment, a brief summary is given of the elements that need to be taken into account to determine whether a tool meets all relevant quality standards when used to measure suicidal behavior.

The fact is that suicide risk is particularly difficult to assess, as it constitutes a multi-causal behavior and is determined by various risk factors (Plaza, 2007). However, a variety of scales and inventories are currently available which serve to assess suicide risk and ideation, the latter being the first stage in the onset of this behavior.

- *Beck Scale for Suicide Ideation* (Beck, Kovaks and Weisman, 1979): This test measures the intensity and dimensions (degree and severity) of suicidal thoughts, wishes, concerns and threats, as well as the characteristics and expectations of the individual attempting suicide. In other words, the items assess the frequency and duration of suicidal thoughts, as well as the patient's attitude towards them. It also evaluates the intensity of the wish to die, the wish to live, the wish to attempt to take one's own life, the plans to carry it out, should there be some, and the subjective feelings of control about contemplating suicide. The scale is made up of 21 items, each one with three options graded according to suicidal intensity, ranging from 0 to 2. The sum of these items indicates the severity of suicidal ideas. The last two items are not rated, as they measure the number of previous suicide attempts and the seriousness of the intent. When assessing suicidal behaviors, the previous month's occurrences are considered, where items 4 and 5 determine whether to continue with or suspend the interview. The cut-off point proposed by Beck is as follows: a score greater than or equal ($\geq$) to 10 indicates that the individual is at risk of committing suicide.
- *Suicide Intent Scale* (Beck, Shuyler and Herman, 1974): This is an interviewer-administered assessment tool comprising 15 items each rated from 0 to 2. It was designed to assess suicidal intention. The higher the score, the greater the probability that a suicide attempt will occur.
- *Okasha Scale of Expectations about Living-Dying* (Okasha, Lotaif, Sadeka, 1981): This questionnaire comprises 4 questions with yes or no answers that assess a suicide ideation continuum of severity during the past 12 months. The questions are: "Have you ever experienced the feeling that life is not worth living?"; "Have you been confronted with situations that have made you wish you no longer exist?"; "Have you ever thought that dying is better than living?"; and "Have you ever come close to attempting to take your own life?" Some studies (Okasha et al., 1981) have used a cut-off point of 1 or more when selecting the cases of suicidal ideation.
- *Roberts Suicidal Ideation Scale* (Roberts, 1980): This is part of the *Center for Epidemiologic Studies-Depression Scale* (CES-D by Radloff, 1977). The Roberts scale comprises 4 items: "I couldn't go on"; "I thought about death"; "I felt that my family would be better off if I was dead"; and "I thought about killing myself". These items explore the cognitive content of thoughts about death in general and about oneself. The response format ranges from 0 to 3 and records the presence and duration of suicide ideation experienced during the past week. The an-

swer alternatives are: 0 = 0 days; 1 = 1-2 days; 2 = 3-4 days; and 3 = 5-7 days in the past week. The cut-off points used in individual studies vary according to the criteria adopted by the researcher. Sometimes the mean will be used plus a standard deviation, or the sum of all 4 items, that is, all 4 symptoms.

- *Composite International Diagnostic Interview* (CIDI) (WHO-IASP, 2008): This measure was developed by the World Health Organization and the Substance Abuse and Mental Health Services Administration (SAMHSA). It is a fully-structured interview intended for use in epidemiological studies, and assesses mental disorders according to the definitions and criteria of the International Classification of Diseases (OMS, 1992) and the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2002). The CIDI includes the question: "Have you ever seriously thought about committing suicide?" The questions elicit 'yes' or 'no' answers.
- *Suicide Assessment Scale (SUAS)* (Niméus, Alsén and Träskman-Bendz, 2001): This tool was designed to measure suicide lethality risk levels over time following a first attempt. Its predictive validity was tested. SUAS ratings were compared to ratings from other scales, and related to age and psychological diagnoses including comorbidity. High scores in the SUAS were significant predictors of suicide. The authors identified cut-off SUAS scores which alone and in combination with certain diagnostic and demographic factors are of value in the clinical evaluation of suicide risk after attempting to take one's own life.
- *Columbia-Suicide Severity Rating Scale* (C-SSRS) (Posner et al., 2011): This screening tool was designed to assess the severity of suicidal ideations and behaviors leading up to an initial suicide attempt. The questionnaire comprises five degrees of ideation, ranging from "wish to be dead" to "active suicidal ideation with specific plan and intent". It also identifies a range of preparatory behaviors such as writing a will, buying a gun, etc. At no extra cost, its authors provide translations to clinicians and researchers upon request and in various languages. Predictive validity was examined for both adolescents and adults, delivering adequate results (Posner et al., 2011).

Other self-reports include the *Suicide Probability Scale* (Cull and Gill, 1988) and the *Beck Hopelessness Scale* (Beck, Weissman, Lester and Trexel, 1974).

When it comes to children and adolescents, there are instruments like the *Child Suicide Potential Scale (CSPS)* (Pfeffer, Jiang and Kakuma, 2000), which is administered as a semi-structured interview and measures the multifactoral elements of suicidal risk.

In addition to developing measurement tools on the basis of the categories provided, it is necessary to recognize the applicability in terms of the psychometric properties of the measures and those that are used to assess risk of suicide in adolescent and adult populations (Gregory, 2001; Cohen, 2001). It is also important to promote interest in the development of assessment tools that provide useful empirical evidence as an element of judgement in order to make the right decisions about the procedures performed by healthcare professionals who address suicidal behavior and to see that these procedures are successfully reflected in epidemiological indicators. Furthermore, it is necessary to highlight the importance of using specialized tools, that is, valid and reliable measures designed for the context and the target group to which they are applied.

Intervention strategies following a suicide attempt:

In this case, intervention strategies are targeted at those people who have had a failed suicide attempt, as well as those individuals who resort to self-harm. In a study carried out by Fleischmann et al (2008) on 1.878 people across 5 countries (Campinas in Brazil; Chennai in India; Colombo in Sri Lanka; Karaj in Iran; and Yuncheng in China), it was found that brief intervention and patient education plus repeated follow-up contacts was much more effective than traditional therapeutic intervention in an emergency care setting when dealing with suicide attempters. The information session included knowledge about suicidal behaviors and about alternative constructive coping strategies in relation to the event that triggered the sucide act.

It is therefore considered imperative to come up with different action strategies that are simple and practical, and which could turn out to be extremely useful for those persons who have gone through a failed suicide attempt.

On leaving hospital, the individual who has tried to take their own life will present different feelings, some of them contradictory: shame, irritation, anger, sadness, happiness, etc. (Spanish Confederation of Associations of Families and People with Mental Illness-FEAFES, 2006), and a crucial first step is to declare that these feelings are normal under these types of circumstances. Furthermore, it would be beneficial, particularly soon after the attempt, to implement the following therapeutic approaches:

- Give information about what has happened, the resulting effects and the treatment received
- Request counseling
- Request information about resources and associations in the area where patients can go to for guidance and support
- Draw up a safety-net plan in writing. The purpose of this plan is to reduce the risk of a repeat suicide attempt in the future; although each plan is different for each person, they do share important points in common:
  - Signs and symptoms that may indicate a return to suicidal thoughts
  - When to seek specialized treatment
  - Information on how to contact one's psychologist, friend or family member

- If suicidal thoughts persist, this must be communicated to a person of trust, a kind of ally, be it a family member or a friend
- Developing a routine, setting schedules and everyday activities
- Encouraging group-based and social activities
- Encouraging hobbies and activities which in the past proved enjoyable, as this may reduce or lessen thoughts of self-harm
- Allowing the person of trust to keep hold of those objects that may lead a person to attempt suicide again or use as an instrument to harm themselves (photographs, pills, sharp objects, etc.)

These guidelines would be the first to discuss with the individual who has experienced a failed suicide attempt or members of the family. However, these actions do not seem to be enough, as there are other specific interventions that need to be undertaken with these people based on well-ground research on the control of vulnerability and protective factors (Bandura, 1999; Beatriz, 2005; Rotter, 1975; Seligman, 1986). Thus, when putting in place a realistic intervention process for suicide attempters, the following two points are seen as necessary (Sánchez-Teruel, 2010):

- To act upon those factors where the individual (and the professional) have some capacity to effect control and change (Evans, Owens and Marsh, 2005);
- To consider suicidal behavior multidimensional in nature, and more than just a symptom of certain biopsychosocial alterations (Linehan, 2008).

Alternative theories (Mann et al., 2009; Mann, Brent and Arango, 2001; Mościcki et al., 1988; Nock et al., 2008) suggest that suicide be treated not as a sign of illness but as a nosological entity in itself, where individual and social dysfunctions interact with each other. In fact, the American Psychiatric Association plans to include a recommendation on the need to assess, as an independent axis, the presence (or lack thereof) of suicidal risk (American Psychiatric Association-APA, 2013) in the next edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V). In this view, we could group the most effective treatments into the following categories:

A. Biological treatments

Depending on the risk detected by the doctor (emergency or primary care) and the patient's support network, only then will the course of action be decided: outpatient treatment or the need for hospitalization (Pascual et al., 2005). If the suicide attempt results in injury or a risk to one's health, the individual must be referred to a general hospital where, after being stabilized, he or she will receive regular assessment by a team of mental health professionals (Pascual et al., 2005). When outpatient treatment has been prescribed, the mental health services should be contacted in order for a joint treatment plan to be drawn up, that is while suicidal ideation or risk persists. This consultation should take place within the first 24 hours and at the most 72 hours. The patient is subsequently assessed by a mental health team, which usually leads to a psychopharmacological treatment intended for the occurring disorder (depression, anxiety, schizophrenia, etc.) or simply to aleviate it. With regard to this commonplace approach, especially when dealing with public services dedicated to mental health in Spain, several issues are of importance here:

- Some authors (De Vicente, Albarracín and Berdullas, 2008; Guinea, 2007) alongside the Spanish Confederation of Associations of Families and People with Mental Illness (FEAFES) (FEAFES, 2003) are of the view that not enough alternative-care options have been developed, a result of the psychiatric reform in Spain where mental health was deinstitutionalized. Since then, groups of people suffering from some kind of mental disorder, their family and care providers have felt the brunt of these healthcare deficits which hinder normalization and adequate care. It is precisely the user and family-led associations attached to the FEAFES and other organizations with like-minded objectives (Spanish Federation of Psychosocial Rehabilitation Associations-FEARP) that are largely covering this healthcare deficit on a national level.
- Recent meta-analyses (Kirsch et al., 2008) of 4 antidepressants demonstrated, among other things, that the efficacy of these drugs and the placebo was very similar for those patients with between moderate and severe depression. This was also proven in earlier studies (Khan, Warner and Brown, 2000), meaning that alternative treatments to drugs compared with those that the patient strongly believes will lead to improvement can be just as effective as drug-based treatment. In this investigation, it is also suggested that psychological treatment for depressive disorders between the first 6 and 8 weeks from the date treatment began would be the most recommended course of action owing to its proven efficacy, and particularly because it removes one of the most negative side effects that the use of antidepressants causes in the first weeks of treatment due to its "disinhibiting effect", which opens the way for suicidality (for example, suicidal ideas and attempts, self-injury, emotional instability, etc.) (Albarracín, 2007; Gunnell, Saperia and Ashby, 2005). Thus, there is a clear emphasis on the suitability of a psychological approach as the first option in treating mood disorders like depression (Kirsch et al., 2008). In fact, according to these authors, it would be suitable to combine psychological intervention with pharmacological treatment in certain cases of mild or moderate depression, particularly in the child and youth population. Those behind this study insist that they are not contradicting the potential therapeutic benefits of antidepres-

sants, but rather want to demonstrate that in patients with mild or moderate depression, the high expectations for improvement constitute a bigger change factor than any chemical action from the antidepressants (Kirsch et al., 2008).

- In studies where trials using specific medication that could have direct effects on suicidal behaviors have been conducted (Hirsch, Walsh and Draper, 1983; Meltzer et al., 2003; Montgomery et al., 1979; Verkes, Hengeveld, Van Der Mást, Fekkes and Van Kempen, 1998 cited in Hawton et al., 2008), only two investigations have been identified which show that the chosen medication had a significant reduction effect on suicidal attempts compared to the control conditions (flupentixol vs. placebo in Montgomery et al., 1979 and clozapine, olanzapine versus control in Meltzer et al., 2003). The most recent of these two research works (Meltzer et al., 2003) was a comparative study on the effects of clozapine against olanzapine (neuroleptic drug) in people who had attempted to take their own lives, which found that clozapine (neuroleptic) produced a significantly lower number of suicide attempts compared to the control groups.
- In other meta-analysis studies based on 23 psychosocial and psychological research projects, Hawton et al. (2008) found there to be no evidence to indicate that antidepressants (tricyclics and selective serotonin reuptake inhibitors-SSRIs) were generally effective at preventing repeat episodes of self-injury. Interestingly enough, research involving paroxetine (antidepressant of the SSRI type) (Anisman et al., 2008; Working Group on the Management of Major Depression in Adults-GTMDMA, 2008) demonstrated a marked reduction in suicide attempts for the group with a history of one to four episodes of deliberate self-harm compared to similar patients who received a placebo; however, there was no evidence of a similar benefit in subjects that had experienced five or more prior episodes of deliberate self-harm. This finding raises the question of whether the type of antidepressant treatment that may be effective in patients with a history of previous attempts is likely to vary according to the number of prior episodes (Hawton et al., 2008).

Finally, other studies on suicide (Carballo et al., 2009; Johnson et al., 2011; Mann et al., 2009; Wasserman, Terenius, Wasserman and Sokolowski, 2010) alert us to the need to consider more eclectic models as well as effective methods to explain multidimensional behaviors like suicide. These investigations report that suicide attempts and behaviors may be determined by a series a risk factors (clinical, neurobiological, neurocognitive, genetic, behavioral and personality traits) known as endophenotypes (Gottesman and Gould, 2003), and which could be considered the expression of the epigenetic vulnerability of an individual presenting suicidal behavior or intent. It would seem that the endophenotypes which have received the most support in scientific literature are: aggressive/impulsive traits, the early onset of major depression, neurocognitive alterations and a higher cortisol level in stressful social situations (Manderscheid et al., 2010; Mann et al., 2009; Wasserman et al., 2010).

B. Psychosocial treatments

Recent reviews which compare psychological treatments among themselves with pharmacological ones have found that psychosocial treatments on their own seem to be more effective than psychopharmacological ones as the sole treatment (Comtois, 2002; Hawton et al., 2008; Leitner, Barr and Hobby, 2008). Under the umbrella of psychosocial treatments, Cognitive Behavior Therapies, mainly Cognitive Therapy and Dialectical Behavior Therapy, were considered the most effective treatments following a suicide attempt or following self-inflicted injuries (Comtois, 2002; Leitner et al., 2008). In fact, in several reviews where the efficacy of psychosocial treatments to reduce self-injurious or suicidal behaviors was compared, seven interventions were found to be significantly effective in reducing suicide risks, and of these seven studies those that did not seem to present methodological problems suggested that only three of these interventions were significantly more effective at intervening with these patients (Comtois, 2002; Hawton et al., 2008; Hepp, Wittmann, Schnyder and Michel, 2004; Knox, 2006; Leitner et al., 2008). The most effective interventions were cognitive therapy, dialectical behavior therapy and interpersonal therapy, and some of these studies suggested that one could maximize the efficacy of these therapies if contact sessions were conducted outside of the clinical setting (Knox, 2006). Another finding was that specific intervention programs for suicides that were denied inclusion within the health system and which consisted of contact by letter during the first two years following the intent or emergency cards which would give the patient access to healthcare services straight away significantly reduced actual death by suicide (Joiner and Van Orden, 2008; Knox, 2006; Leitner et al., 2008; Motto and Bostrom, 2001).

An important study in the field of *cognitive therapy* was carried out by Chioqueta and Stiles in 2007, where they discovered that the cognitive content of a suicidal person's belief system is different to a person who does not become suicidal, the main difference residing in the types of automatic negative thoughts that a person has in a moment of crisis, and where these thoughts are more closely related to death as a way out (Chioqueta and Stiles, 2007; Evans, Owens and Marsh, 2005; Ruiz, Navarro-Ruiz, Torrente and Rodríguez, 2005). That said, according to the authors, these results should be replicated, applying them to a clinical population and taking into account gender differences (man/woman) (Chioqueta and Stiles, 2007; Ruíz et al., 2005).

With regard to *dialectical behavior therapy (DBT)*, this provides an opportunity to acquire the necessary skills to identify and regulate emotions: experience, validate and accept

them, and from there regulate them (García, 2006; Mancini, 2003; Torres, 2007). This form of therapy is labeled "dialectical" as it seeks balance between opposites, for example, acceptance and change, validation and challenge, rigidity and felxibility (Mancini, 2003; Vallejo, 2006). DBT is performed by several therapists rather than just one, who in turn are supervised by other therapists (García, 2006). There are three main components to DBT: group therapy, individual therapy and phone coaching between sessions. Group therapy focuses on managing emotions, learning how to be more effective in relationships, and acquiring distress tolerance techniques. Individual therapy covers staying motivated, understanding how and why behavior problems occur, and identifying alternative, more useful ways of coping with difficult situations. Phone-based consultations are carried out between sessions to primarily help the patient to generalize the skills and strategies learnt in therapy to daily life (García, 2006; Torres, 2007). The aspects that constitute important innovations of this therapy are based on an intervention of therapeutic principles and not a treatment manual (García, 2006; Torres, 2007). This program is made up of a hierarchy of therapeutic goals that are addressed depending on their importance. The hierarchy set out in individual therapy is formed by behaviors of a suicidal and parasuicidal nature, behaviors that interfere with the course of therapy, behaviors that affect quality of life and increase behavioral skills. This structure allows for a flexible approach according to the needs of each patient (García, 2006; Torres, 2007).

In terms of *interpersonal therapy (IPT)* (Herlein, 2002; Joiner and Van Orden, 2008), this derives from "Interpersonal Psychotherapy" (Klerman et al., 1984; Markowitz, 1999) which is frequently used due to its clinical efficacy in the treatment of depression disorders and borderline personality disorder (GTMDMA, 2008; Herlein, 2002; Servicio Catalán de Salud (Catalan Health Service), 2006) and is based on the assumption that emotional and behavioral alterations are a result of conflict in interpersonal relationships. The view is that we frequently suffer emotional and work-related overloads in our relationships with other people. Loss of reinforcers, that is, of relationships or any other element that we find rewarding on an interperonal level, is considered a significant stressor which, on occasions, favors what some authors have called "low belonging", and this can lead a person to suicidal behavior (Joiner and Van Orden, 2008). The role of interpersonal problems in the onset and continuance of emotional alterations has been widely explored (Herlein, 2002; Sánchez-Teruel, 2013), and it has been found that:

- Partner conflicts and loss increase the probability of suicide
- The deficit in interpersonal relationships is a significant risk factor which favors the emergence of emotional problems
- The presence of positive interpersonal relationships is a strong protective factor in depression and suicidal behaviors, given that these sound interpersonal relationships favor belonging and integration and ease the difficulties that may arise

IPT is divided into 3 stages over a period of 12 to 16 weeks. It consists of weekly sessions during the acute stage, where the therapy is structured and focuses on helping the patient understand the most recent events in interpersonal terms and exploring alternative ways of handling such situations. This form of therapy addresses four problem areas: grief, interpersonal disputes, role transitions and interpersonal deficits (GTMDMA, 2008).

In recent years, different authors and national and international healthcare institutions (Comtois, 2002; Hepp et al., 2004; Linehan, 2008; Leitner et al, 2008, Ministry for Health, Social Policy and Equality-MSPSI, 2011; Catalan Health Service, 2006; WHO, 2012) have consistently acknowledged the efficacy of psychosocial therapies in treating suicidal behavior, especially those treatment programs that are specifically designed for suicide intervention, such as cognitive behavioral therapy (especially cognitive therapy and dialectical behavior therapy), interpersonal therapy (IPT) and treatment programs via letter, computerized devices and emergency cards (Leitner et al, 2008; Motto and Bostrom, 2001). Furthermore, it has been shown that suicide-specific treatments are always more effective than treatments aimed at suspected underlying disorders (Linehan, 2008).

On the other hand, *family therapy* provides the suicide attempter a safe and trusting environment. It is important to stress the positive role that family and friends play as therapeutic agents when it comes to rehabilitation and relapse prevention (Spanish Confederation of Associations of Families and People with Mental Illness-FEAFES, 2006). Furthermore, these groups are an essential source of information, as they are best placed to help professionals understand the patient, their emotional state of mind and the world around them. Family members play a fundamental role as therapeutic agents in the patient's rehabilitation and suicide relapse; however, they are more often than not unprepared for this, resulting in stress overload which at times leads to problems for the family members themselves who have become caregivers, and which makes their work difficult (Spanish Confederation of Associations of Families and People with Mental Illness-FEAFES, 2006). Research conducted by some authors (Harrington et al., 1998 cited in Hawton et al., 2008) on home-based family therapy versus conventional care is of interest, as patients who were not depressed and were assigned to the group undergoing family-led therapy demonstrated a greater reduction in suicidal ideation in follow-up sessions compared to those assigned to conventional care.

The findings of other studies (Haquin, Larraguibel and Cabezas, 2004; Sánchez-Teruel, 2013) support the notion that the family first and school later (for children and adolescents) could become a means of intervention in terms of encouraging protective factors and reducing risk factors in people (children, adolescents and adults) who have experi-

enced a previous suicide attempt. Literature mentions family as a relevant protective or risk factor, this group performing a buffering role in the development of risk factors for early psychopathology. The family instills in the child or adolescent hopes for the future, enables and supports the idea of belonging to a group, produces appropriate moral development, influences the development of self-concept and self-esteem, and anticipates at-risk behaviors characteristic of adolescents. The *school system*, meanwhile, can play a decisive role in the prevention and management of problem issues at this age, primarily from an academic perspective and when dealing with peer group integration. The educational arena may become a source of satisfaction for the young person, granting the opportunity to exercise and put to the test their capabilities and skills. At the same time, it can provide an opportunity to accumulate a great deal of knowledge about themselves and the field, which in turn supports the creation of certain coping strategies oriented towards better management and greater perception of control in all situations. This enhances a person's self-efficacy expectations and therefore favors the development of positive self-esteem.

Considerable uncertainty still remains concerning which types of biopsychosocial treatments are more effective for patients attempting suicide as well as for those displaying self-aggression; the inclusion of insufficient numbers of patients in clinical trials is the overriding limiting factor. There is a real need to undertake research using a larger participant pool and comparing different treatments associated with this type of behavior. The results of small single trials that have been linked to statistically significant reductions must be interpreted with caution, and it is desirable that future work replicates those treatment programs (biological and psychosocial) of a more promising nature (Guo and Harstall, 2004; Hawton et al., 2008).

Conclusion

As has been shown, there is a wealth of research which demonstrates that suicide is a serious global public health problem (Fleischmann et al., 2008; IASP, 2008; WHO, 2010). Some international institutions (IASP, 2008; WHO, 2001; WFMH, 2006) and various authors (Andriessen, 2006; Chishti et al., 2003; Dublin, 1963; Pritchard and Hean, 2008) report that suicide mortality statistics could, in some countries, be considerably higher than what the data provided by the national statistics offices of these nations actually reflects. This may be explained by the influence of religious, cultural and political factors, which could be down to the way in which data on deaths by suicide is collected, or even associated with the first person who found the body, their beliefs, or how they are related to the victim.

The suicide prevalence rates in Europe are found to be very high and, in general, are on the rise, especially among adolescents and young people aged between 13 and 35 years, which today is one of the high-risk groups (Eurostat, 2009; Evans, Owens and Marsh, 2005; O'Connell et al., 2004; WHO, 2010; Soler and Gascón, 2005; Stone et al., 2002). Moreover, this group is one of the most vulnerable to the influence of the different psychosocial factors that promote suicidal ideas and behaviors (Borrell et al., 2001; Evans, Owens and Marsh, 2005; Gould and Kramer, 2001; Gunnell, 2000; Hawton et al., 1998; Pritchard and Hean, 2008, WHO, 2003; Zonda, 2006). A possible explanation resides in the numerous sources of stress associated with the significant physiological and physiosocial changes that go hand in hand with this stage of life, and which makes this population more vulnerable to these types of ideas than any other age group (Ruiz et al., 2005). This upward trend in suicide deaths is particularly evident in some European countries, including Spain (INE, 2003, 2006; Stone et al., 2002; WHO, 2005, 2008), where suicide is the number one non-accidental cause of death after road traffic accidents (INE, 2011). This could be explained by the fact that in recent years the DGT (Spanish Road Traffic Authority) has carried out a number of accident prevention campaigns which have led to a notable drop in road accidents, yet no similar actions for the prevention of suicidal behavior aimed at the general population and least of all at-risk groups have been conducted in this country.

On the other hand, various studies have shown a positive correlation between a favorable attitude towards suicide and both suicidal ideation and suicide attempt, considering this a factor with a high predictive power for suicidal behavior in adolescents and young people (Ruiz et al., 2005; Ruíz, Blanes and Viciana, 1997; Stein, Hollander and Liebowitz, 1993). Hence, there are currently no programs or specific instruments for detecting favorable attitudes towards suicide in educational and social and family settings, just as there are other types of prevention campaigns for these groups in other areas of health. This may be explained by the fact that suicidal behavior is believed to be highly contagious in this population. However, it is necessary to focus attention on programs across the world with these characteristics and which yield excellent preventive results (Gould and Kramer, 2001; Mirjami, Linnea and Marttunen, 2011). It is also important to consider what some authors have already predicted (Baker and Fortune, 2008; Becker et al., 2004; Biddle et al., 2008) with regard to the need to analyze the relationship between computer-based means (chat, social networks, etc.) and suicidal behavior, owing to the fact that these especially vulnerable groups (children, youths, etc.) use these tools on a daily basis. Social networking and telematic technologies exert an immeasurable influence over this population. It would be interesting to use telematic technology as a means of implementing specific preventive actions and guidance regarding these types of behaviors, and which act as antennae to detect favorable attitudes, and thus reap the impact of social networks in preventing suicidal ideation and possible suicide attempts in adolescents and youths (Sánchez-Teruel, 2013).

Generally speaking, it would appear that suicide prevention programs aimed at the general population and at-risk

groups are few and far between (Mann et. al., 2005). In cases where prevention programs have been implemented (Muñagorri and Peñalver, 2008), it is crucial to determine what features of these initiatives are effective at reducing suicide rates and sucide attempts in order to optimize the use of limited resources.

On the other hand, when looking at the assessment tools used for this purpose, it has been shown that the vast majority (or at least those most frequently used by researchers and clinicians) measure very specific aspects of suicidal behavior (ideation, attempt, lethality attempts, etc.) and fail to predict suicide in a holistic way. This can be explained by the fact that this behavior is multicausal in nature and highly complex, which, for the most part, makes it difficult to assess as a whole. That said, it would seem that recent research (Posner et al., 2011) has begun to create assessment tools that assess the risk of a suicide attempt occurring, adopting a more holistic approach without losing prediction levels. Although this type of tool presents certain limitations, for example, training is required before it can be applied properly, the existence of this type of measure has already created some expectation for appropriate validity and reliability in comprehensively measuring suicidal behavior (Posner el al., 2011).

Finally, of particular interest are long-term therapeutic interventions that have proven more effective following a non-lethal suicide attempt (Muñagorri and Peñalver, 2008). Cognitive therapy, dialectical behavior therapy, interpersonal therapy and the community-led kind (family and school-based therapy) seem to offer the best results in the long run.

There are several limitations to this review, one of them being that not every suicidal behavior assessment test with good psychometric properties has been presented here. However, the review's logical extension and the fact that it follows the objectives of this type of document support the approach taken. Another limitation is the lack of assessment tools for children and adolescents, which would be an interesting line of future research. What should also be seen as a limitation is that no other therapies and treatment programs with proven efficacy in relation to people who have made a suicide attempt in the past have been specified here. Future work should aim to respond to the limitations posed and, above all, highlight a particular behavior, suicidal behavior or some of its stages: ideation, self-injury, suicide attempt and completed suicide. Together and separately, they have significant consequences and result in more deaths every day, affecting increasingly younger populations in this society we call a Society of Well-being.

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(Article received: 8-3-2012; revision received: 16-6-2012; accepted: 16-5-2013)