



ARTÍCULO ORIGINAL

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## REVIEW OF COMPLETED SUICIDE AND SUICIDAL IDEATION IN ONCOLOGIC PATIENTS FROM A GEOGRAPHIC CLASSIFICATION

### REVISIÓN DE SUICIDIOS COMPLETADOS E IDEACIÓN SUICIDA EN PACIENTES ONCOLÓGICOS CON DISTRIBUCIÓN GEOGRÁFICA

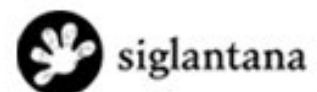
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## RESUMEN

El riesgo de suicidio en oncología es casi dos veces mayor que en la población general, principalmente asociado a trastornos de salud mental y al diagnóstico. A través de una búsqueda bibliográfica en MEDLINE, PsycINFO, ISOC y CISNE llevada a cabo entre el 2004-2015, se reportaron 823 artículos de los cuales, se revisó su relevancia a partir del resumen del artículo. Dos ciento quince artículos fueron identificados como relevantes y después de aplicar los criterios de inclusión y exclusión, 68 artículos se incluyeron en la revisión. El riesgo de comportamientos suicidas fue mayor en los Estados Unidos, Suecia y Corea del Sur. Principalmente en los hombres, con métodos más violentos de suicidio, la edad (adultos jóvenes y mayores >60), con tumores en la próstata, pulmón, páncreas, cabeza y cuello. Se encontró una alta prevalencia de comportamientos suicidas en la población con cáncer, sin embargo, las diferencias entre países demuestran lo poco que se ha investigado sobre los factores de riesgo..

**Key words:** Suicide; Suicide ideation; Suicide attempt; Cancer; Mental health.

## ABSTRACT

The risk of suicide in oncology is almost two times higher than in the general population, mainly associated to mental health disorders and diagnosis. A literature search of MEDLINE, PsycINFO, ISOC and CISNE between 2004-2015, yielded 823 articles of which the abstract were reviewed for their relevance. Two hundred fifteen articles were identified as relevant and following application of inclusion and exclusion criteria, 68 articles were included in the review. The suicide behaviors risk was higher in the USA, Sweden and South Korea. Mainly in men, with more violent methods of suicide, age (young adults and older>60), with prostate, lung, pancreas, head and neck tumors. There was high prevalence of suicidal behaviors in cancer population, however the differences between countries show how little risk factors has been researched.

**Key words:** Suicide; Suicide ideation; Suicide attempt; Cancer; Mental health.

## INTRODUCTION

Cancer and suicide behaviors are considered life-threatening events causing million of deaths worldwide (Quill, 2008; Spoletini et al., 2011). In Europe, cancer is a leading cause of death with 1.5 million deaths (Malvezzi, Bertuccio, Levi, La Vecchia, & Negri, 2013; Torre et al., 2015). And, there are between 3 and 31.5 suicides every 100,000 persons (Hoven, Mandell, & Bertolote, 2010). Risk factors in general population can be applied to oncologic populations (Robson, Scrutton, Wikinson & MacLeod, 2010) i) gender, women

have higher risk of suicide attempts than men, as well as higher levels of suicidal ideation and passive methods of suicide (Aghanwa, 2004) meanwhile men have higher risk of completed suicide and active lethal methods (Beautrais, 2003). ii) Age, young and old adults have a high risk of completed suicides, especially with socioeconomical problems (Carroll-Ghosh, 2003; Sudak, 2005). iii) The range of suicides of people with mental illnesses is 47%-74% , especially major depression and psychotic disorders (Nock, Hwang, Sampson, & Kessler, 2010).



Oncologic patients, and especially those in palliative situation, may have high levels of distress and mental disorders during illness process, especially anxiety and depression (Holland & Alici, 2010; Diaz-Frutos, Baca-García, García-Foncillas & López-Castroman, 2016). The prevalences of depression and anxiety in oncologic patients are 50% and 40%, respectively (Chochinov, 2001; Massie, 2004; Mitchell et al., 2011; Walker et al., 2014). However, around 10% of oncologic patients are referred to mental health professionals, hence the undermining of psychological problems may increase the risk of suicide behaviors (Holland & Alici, 2010; Weinberger, Bruce, Roth, Breitbart, & Nelson, 2011). There is a high risk of suicidal behaviors in oncologic patients, for instance, suicidal ideation is ranged around 10%-40% and completed suicides are twice than in the general population (Misono, Weiss, Fann, Redman, & Yueh, 2008). Other relevant risk factors are substance abuse (Botega et al., 2010; Passik & Theobald, 2000), bipolar disorders, psychotic disorders and personality disorders that may affect the adherence to treatments and survival of the patients (Chang et al., 2014; Miovic & Block, 2007; Tseng, Chang, Liao, Chen, & Lee, 2010) and the distress or psychological problems after surviving the cancer (Lu et al., 2013; Recklitis, Diller, Li, Najita, , Robison, & Zeltzer, 2010). This review aims at exploring the current literature to address the reported incidence and rates of suicide behaviors in cancer patients geographically. Moreover, this paper focus on identified risk factors related to suicide behaviors and cancer to overcome previous limitations (Robson, et al. 2010).

## METHODS

Out search strategy included the following databases Medline, Pubmed, PsycInfo, Web of Science and ISOC/CISNE (spanish databases) searched between January 2004 and April 2015, using keywords (spanish-english): "cáncer-cancer, suicidio-suicide, ideación suicida-suicide ideation, intento suicida-suicide attempt, conductas suicidas-suicidal behaviors", we did not exclude any age or type of cancer or suicide behaviour. Search results were merged and duplicate studies removed to produce one set of results with 823 articles. The abstracts of these 823 articles were reviewed for their relevance to the current review. This produced 215 articles for review, 68 of which met the inclusion criteria: papers within the specified 11-year period, written in english or spanish,

the population of study was oncologic patient, the subject of study was completed suicide, suicide attempt or suicidal ideation risk, the sample size was greater than 10 and 1 or more of the variables associated with cancer and suicide such as gender, age, type, site of cancer, risk factors including psychological and clinical (time of diagnosis, treatment and prognosis), and country of origin.

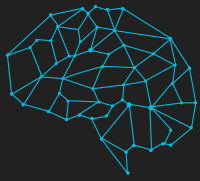
## RESULTS

Major findings were completed suicides and suicidal ideation and the following risk factors: country, type of tumor, gender, age, depression, time from diagnosis, time of hospitalization, and other sociodemographic and clinical variables (employment, education, religion...). Following, we have included the percentage of papers by every country and the incidence/prevalence of suicide behaviours in each country. Although the methodology and study population vary greatly, we present data from the reviewed papers in order of relevance in the text and year in the tables.

### Completed suicide in oncologic patients

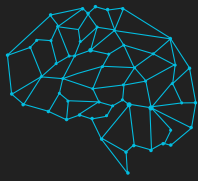
This review shows that 34.9% of the articles were from the USA, 44.2% Europe, 11.6% Asia and 2.3% Iberoamerica (Table I). The reported incidence of suicide in the USA was 31.4 every 100,000 especially during the first 5 years after diagnosis (Fang, Keating, Mucci, Adami, Stampfer, Valdimarsdóttir, & Fall, 2010; Johnson et al., 2012; Ward et al., 2013). In Canada, a high risk of suicide was found in the first three months after diagnosis (Chung & Lin, 2010; Lin, Wu, & Lee, 2009) as well as in Taiwan (Chung & Lin, 2010; Lin et al., 2009). Especially high levels of completed suicide in oncologic patients have been found in South Korea during the first year of diagnosis (Ahn et al., 2010). In Europe, the estimated rates vary between 1.3 and 16 depending on origin, type of tumor and time after diagnosis (Fall et al., 2009; Fang, Fall, Mittleman, Sparén, Ye, Adami, & Valdimarsdóttir, 2012; Yousaf, Christensen, Engholm, & Storm, 2005). Scandinavian countries, especially Sweden have the highest prevalences in Europe (Fang et al., 2012).

Accordingly, the type of cancer (lung, head, neck, oral, gynecologic and pancreas) is a risk factor of completed suicide (Dormer, et al., 2008; Kendal & Kendal, 2012; Mahdi et al., 2011; Misono et al., 2008). Males, under 18 or over 60, unemployed, without religious beliefs and without social su-



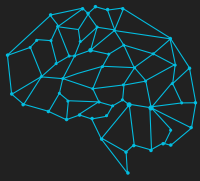
**TABLE I. Completed suicide in oncologic patients**

AUTHOR/YEAR	PARTICIPANTS/ COUNTRY	STIMATED RISK OF COMPLETED SUICIDE (OR)	RISK FACTORS (OR)
Hem, Loge, Haldorsen, & Ekeberg, 2004	589 (Norway)	SMR=1.6 (1.4-1.7) men SMR= 1.4 (1.2-1.6) women	Respiratory tumors in Men (SMR=4.1 (3.0-5.5)) Oral & pharynx in Women SMR=3.7 (1.4-8.0) Breast after 5 years (SMR=1.8 (1.3-2.5)) Single First month after diagnosis
Miccinesi, Crocetti, Benvenuti, & Paci, 2004	90,197 (Italy)	SMR= 1.85 (1995-1999)	First year after diagnosis Age ≥75 years
Björkenstam, Edberg, Ayoubi, & Rosén, 2005	1,031,919 (Sweden)	Male SMR= 2.5 in 1965-74 SMR= 1.5 in 1985-94. Female SMR= 2.9 in 1965-74 SMR= 2.3 in 1985-94.	Women, Severity, tumors: Pancreas, Esophagus, Lung, Biliary. In fact, a slightly higher rate for women was observed for 1985-94 than for 1975-84.
Llorente et al., 2005	667 (USA)	Men SMR= 4.24	First 6 months, depression, doctor visit 1 month before suicide,
Yousaf et al. 2005	564,508 (Denmark)	SMR=1.7 (1.6-1.8) men SMR=1.4(1.3-1.5) women	Firs 3 months Men RR= 2.4 (1.9-3.1) First year Women RR= 2.0 (1.6-2.7) Bad prognosis, breast and respiratory tumor
Christensen, Yousaf, Engholm, & Storm, 2006	91,310 (Denmark)	SMR= 1.0 (0.9-1.2) men SMR= 1.3 (1.1-1.6) women	1 & 3 year SMR=1.5 (1.0-2.2) Age (0-49) SMR=1.2 (0.7-2.0)
Schairer et al., 2006	723,810 (USA)	SMR =1.37 (1.28-1.47)	25 years after diagnosis SMR=1.4 (0.8-2.1) Age (50-59) SMR=1.5 (1.3-1.7) Black SMR= 2.9 (1.4-5.2)
Kendal, 2007	1,316,762 (USA)	OR=6.2 (5.4-7.1) men	Colon-rectal Women HR=0.02 (0.01-0.04) Prostate HR=0.18 (0.16-0.19) Head & neck HR=0.3 (0.3-0.4) Leukemia HR=0.1 (0.08-0.2) Metastasis men HR=2.84 (2.49-3.24) Diagnosis time HR=1.03 (1.02-1.03) Problem surgery HR=3.0 (1.3-6.8) Age HR= 1.03 (1.02-1.03)
Zebrack, Ell, & Smith, 2007	35,814 (USA)	SMR=11 (7.8-15.3)	Age 10-14 years SMR=12.9 (5.6-25.4) 15-20 years SMR=12.1 (7.7-17.9)
Dormer, McCaul, & Kristjanson, 2008	121,533 (Australia)	SMR=1.7 (1.4-2.1) men SMR=1.2 (0.8-1.9) women SMR=1.6 (1.4-1.9) both	First 3 months SMR=5.8 (3.9-8.5) Esophagus, tongue, pharynx, stomach, lung, breast, ovary, ...SMR=3.4 (2.5-4.6)
Miller, Mogun, Azrael, Hempstead, & Solomon, 2008	1,408 (USA)	OR= 2.3 (1.1-4.8)	Mental disorder OR=2.3 (1.3-4.2) Anxiety & personality OR=2.2 (1.3-3.6) Antidepressants OR=2.0 (1.2-3.2) Opioids OR=1.6 (1.0-2.5) Psychiatric comorbidity OR=1.1 (1.0-1.2)



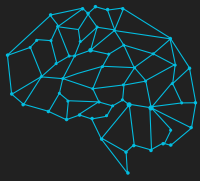
**TABLE I. Completed suicide in oncologic patients (continuation)**

AUTHOR/YEAR	PARTICIPANTS/ COUNTRY	STIMATED RISK OF COMPLETED SUICIDE (OR)	RISK FACTORS (OR)
Misono, et al. 2008	3,594,750 (USA)	SMR= 1.88 (1.83-1.93)	Men, White, single, advanced cancer Age (70-74) SMR= 2.5 (2.3- 2.6) Lung SMR=5.74 (5.3-6.2) Stomach SMR=4.7 (3.8-5.7) Oral & PharynxSMR=3.7 (3.2-4.2) Larynx SMR=2.83 (2.3-3.4) After 5 years diagnosis SMR=2.4 (2.3-2.5)
Fall et al., 2009	168,584 (Sweden)	RR=2.6 (2.1-3.0) HR=1.1 (0.8-1.5) men	After first week RR=8.4 (1.9-22.7) Age 65-74 years RR=2.6 (2.0-3.4) ≥75 years RR=2.5 (1.8-3.4)
Robinson, Renshaw, Okello, Møller, & Davies, 2009	417,572 (UK)	SMR= 1.45 (1.20-1.73) men SMR= 1.19 (0.88- 1.57) women	First year after diagnosis: Men SMR= 2.4 (1.8-3.1) Women SMR= 1.4 (0.8-2.3) Cancer types-gender Men SMR 2.7 (1.7-4.0) Women SMR 2.2 (0.8-4.7) Age (> 75) SMR=1.6 (0.4- 6.2)
Bill-Axelson et al., 2010	77,439 (Sweden)	SMR=1.5 (1.3-1.8)	1 & 2 year SMR=2.2 (1.5-3.0) Advanced cancer SMR: 2.2; 95% CI, 1.6-2.9 Metastasis SMR=2.1 (1.2-3.6) Age ≥75 years SMR=1.57 (1.19-2.03) PSA ≥ 100 Low income SMR=1.72 (1.35-2.17)
Ahn et al. 2010	816,295 (South Korea)	SMR=2.1 (1.9-2.2) men SMR=1.9 (1.7-2.0) women SMR=2.0 (1.9-2.1) both	First year SMR=3.45 (3.2-3.7) Pancreas Men SMR=6.01 (4.3-8.3) Lung Women SMR=3.55 (2.5-4.9) Single RR= 1.44 (1.3-1.6) Unemployed RR= 1.4 (1.3-1.5) Low education RR=1.5 (1.3-1.8)
Conwell et al., 2010	86 (USA)	OR=4.4 (1.2-22.2)	Cancer diagnosis
Chung & Lin. 2010	368,643 (Taiwan)		Unemployed (p<.001) Low income (p<.005) Age ≥ 65 years Oral and respiratory tumors
Fang et al., 2010	168,584 (USA)	SMR = 1.9 (1.4-2.6)	3 months after diagnosis SMR = 1.9 (1.4-2.6) PSA SMR=2.4 (1.2-4.3)-3.2 (2.0-4.8) White SMR=2.2 (1.6-3.0) Age ≥80 SMR=2.4 (1.3-4.1) Single SMR=3.0 (1.9-4.6)
Tseng et al., 2010	672 (Taiwan)	OR=1.8 (0.7-4.6)	Psychiatric comorbidity first month OR=1.8 (0.7-4.6) Psychiatric comorbidity first year OR= 2.5 (1.2-5.3)



**TABLE I. Completed suicide in oncologic patients (continuation)**

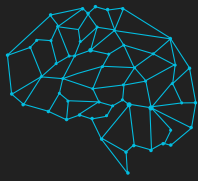
AUTHOR/YEAR	PARTICIPANTS/ COUNTRY	STIMATED RISK OF COMPLETED SUICIDE (OR)	RISK FACTORS (OR)
Mahdi et al., 2011	252,235 (USA)	SMR= 1.4 (1.2-1.7)	Single SMR= 3.1 (1.9-4.9) White SMR= 2.8 (1.9-3.9) Ovary cancer SMR= 2.8(2.0-3.8) Advanced cancer HR=2.6 (1.6-4.2) First year HR=1.6 (1.0-2.6)
Turaga, Malafa, Jacobsen, Schell, & Sarr, 2011	36,221 (USA)	SMR=10.8 (9.2-12.7) both OR=13.5 (3.2-56.9) men OR= 2.5 (1.0-6.5) women	Age ≥60 OR= 2.2 (0.7-6.5) Surgery OR=2.5 (1.0-6.4) Married OR=0.3 (0.1-0.6)
Alanee & Russo, 2012	23,381 (USA)	SMR=1.2 (1.1-2.1)	Age < 30 HR=1.2 (0.5-3.1) stage II HR= 0.5 (0.1-2.1), stage III HR= 0.6 (0.1-2.4)
Crocetti et al., 2011	136,105 (Italy)	SMR= 1.47	Bad prognosis (SMR=2.27 First year SMR=2.87) Age (55-64 years) SMR=2.27
Fang et al. 2012	534,154 (Sweden)	OR=2.6 (2.2-3.1) both RR= 3.2 (2.8-3.7) men RR=2.5 (1.9-3.2) women	First week after diagnosis RR=12.6 (8.6-17.8) Lung RR= 12.3 (7.4-18.9) Esophagus, liver, pancreas RR= 16.0 (9.2-25.5) Age (65-74) RR= 3.7 (2.9-4.5) Psychiatric history RR= 1.7 (1.3-2.2)
Johnson, Garlow, Brawley, & Master, 2012	3,678,868 (USA)	One in three (701 of the patients) who committed suicide in the first year did so within 1 month of diagnosis	0.2% (5875 patients) committed suicide, 36% (2111 patients) within 1 year of diagnosis
Kendal & Kendal, 2012	4,449,957 (Canada)	HR=6.603 (5.997-7.270) men	Age HR=1.017 [1.015-1.018] Head & Neck HR=0.9 (0.8-1.1) Mesenchymal HR= 1.0 (0.8-1.3) Respiratory tumors 1.2 (0.97-1.35)
Nakash, Barchana, Liphshitz, Keinan-Boker, & Levav, 2012	Europe, America, Africa & Asia Israel	SIR=1.9 (1.5-2.2)	Americans and europeans (40-64years) SIR=3.5 (2.1-5.0) women SIR=2.2 (1.2-3.1) men American and european men ≥65 years SIR=1.9 (1.5-2.2)
Nakash, Liphshitz, Keinan Boker, & Levav, 2013	Israel (200)	men: (0.90, 95% CI 0.60-1.19) women: (0.95, 95% CI 0.55-1.37)	Jewish-Israelis of European origin Holocaust men: (0.90, 95% CI 0.60-1.19) women: (0.95, 95% CI 0.55-1.37)
Carlsson et al., 2013	105,736 (Sweden)	RR=6.5 (4.0-10)	Metastasis RR=10 (5.1-21) men RR= 5.2 (2.3-12) Age ≥75 RR=7.8 (3.7-16) Single RR= 9.0 (3.1-26) Socioeconomic level RR=8.1 (3.7-18) 6 months after diagnosis RR=6.5 (4.0-10) States III-IV RR=9.1 (4.9-17) PSA ≥100



**TABLE I. Completed suicide in oncologic patients (continuation)**

AUTHOR/YEAR	PARTICIPANTS/ COUNTRY	STIMATED RISK OF COMPLETED SUICIDE (OR)	RISK FACTORS (OR)
Lu et al. 2013	7,860, 629 (Sweden)	RR= 1.6 (1.0–2.4)	First year after diagnosis RR= 4.0 (1.6-8.1) Cervical and Brain tumors
Panczak et al., 2013	7,280,246 (Switzerland)		Religion
Smailyte et al., 2013	215 (Lithuania)	SMR=1.43(1.23-1.66) men SMR=1.32(0.95-1.80) women	First year after diagnosis SMR=1.12 (0.93-1.34) Low education Men SMR=2.03 (1.62-2.52) Age (60-69) SMR= 1.72 (1.35-2.17) Divorced SMR=2.84 (1.55-4.77) Widow SMR=1.94 (0.71-4.21) Esophagus SMR=7.07 (2.29-16.50) Hematopoietic SMR=3.19 (1.04-7.46) Colon-rectum SMR 3.15 (1.36-6.20)
Ward, Roncancio, & Plaxe, 2013	350,962 (USA)	RR=1.3 (1.1-1.5)	White, married, first 4 years diagnosis Gynecologic 30%
Cole, Bowling, Patetta, & Blazer, 2014	217 (USA)	OR=17.2 (10.9-27.0) men OR=2.6 (1.8-3.7) both	Age ≥ 71 OR=1.3 (0.9-1.9) White OR= 9.7 (6.1-15.5) Low social support OR=0.3 (0.2-0.4) Stressful events OR=2.8 (2.0-3.9)
De la Grandmaison, Watier, Cavard, & Charlier, 2014	232 (France)	OR=2.4 (1.1-5.4)	Men, thyroid, prostate
Mohammadi et al., 2014	46,309 (Sweden)	IRR=2.96 (1.6-5.5) women IRR=1.8 (1.3-2.6) men IRR=1.9 (1.4-2.5) both	Myeloma IRR=3.5 (2.1-6.0) Linfoma IRR=1.9 (1.3-2.7) Migrants
Yamauchi et al., 2014	102,843 (Japan)	RR=1.7 (1.2-2.6) men RR= 2.1 (1.1-4.2) women	Age (40-64) RR=1.9 (1.3-2.8) First year RR= 23.9 (13.8-41.6) Located tumor RR=2.3 (1.3-3.9)
Bolton et al., 2015	1,2 millones (Canada)	OR=1.5 (1.2-2.0)	First 90 days AOR=4.1(1.7-9.8) First year AOR=2.2 (1.1-4.3)
Hultcrantz et al., 2015	47,220 (Sweden)	HR=1.7 (1.3-2.2) men HR=2.1 (1.5-2.7) women HR=1.6 (1.2-2.1) both	Firs 3 years HR=1.9 (1.5-2.3) Myeloma multiple HR= 3.4 (2.3-5.0) Mental illness HR=23.3 (16.6-32.6) Age ≤ 69 HR=1.9 (1.5-2.5)
Vyssoki et al., 2015	915,303 (Austria)	SMR=1.41(1.35-1.47) men SMR= 1.24(1.15-1.34) women SMR=1.23(1.19-1.28) both	First year SMR=3.2(3.0-3.4) Lung SMR=3.9 (3.4-4.4) CNS SMR=2.8 (1.9-4.0) Esophagus, liver, pancreas SMR=2.6 (2.1-3.3)
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Fanger et al. 2010	675 (Brasil)	OR=4.8(3.3-6.7)	Depression OR=18.3(15.4-21.4)

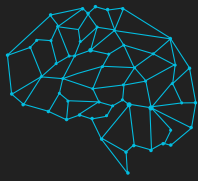
SMR, standardized mortality ratio; OR, Odds ratios; HR, hazard ratio; RR, relative risk; SIR, standardized incidence ratios; IRR, incidence rate ratio



**TABLE II. Suicidal ideation and suicide attempt in oncologic patients**

AUTHOR/YEAR	PARTICIPANTS/ COUNTRY	RISK FACTORS
Recklitis, Lockwood, Rothwell, & Diller, 2006	226 (USA)	Leukemia, Depression, Hopelessness, Pain
Rasic, Belik, Bolton, Chochinov, & Sareen, 2008	863 (Canada)	Major depression OR=3.18 (1.69-5.96) Panic disorder OR=2.15 (1.22-3.77) Agoraphobia OR=5.94 (1.68-21.03) Social phobia OR=5.94 (1.68-21.03) Men OR=0.79 (0.63-1.00) Single OR=0.41 (0.22-0.75) Low education OR=1.39 (1.12-1.72)
Schneider, et al., 2008	980 (USA)	Married, mental illness, lung cancer, other physical illnesses
Walker et al., 2008	229 (UK)	Stress OR=11.2 (7.8-16.0) Pain OR=2.3 (1.6-3.2)
Akechi et al., 2010	5,343 (Japan)	Advanced cancer OR=1.96 (1.20-3.21).
Recklitis et al., 2010	9,126 (USA)	CNS OR=1.5 (1.2-1.9) Low education OR=2.4(1.9-3.1) Poor health OR=12.5 (8.0-19.5) Depression OR=20.4 (17.2-24.3) N Hospitalizations OR=2.8 (1.6-4.8)
Kim & Lee, 2010	138 (South Korea)	Existential vacuum Social support
Madeira, Albuquerque, Santos, Mendes, & Roque, 2011	130 (Portugal)	Major depression (76.9%; p=-.27) Panic disorder (46.2%; p=.001)
Spencer et al., 2012	718 (USA)	Panic OR= 3.2 (1.0-10.4) PTSD OR=4.0 (1.1-14.1). Mental illness OR=4.2 (2.3-7.6)
Lu et al. 2013	7,860,629 (Sweden)	Suicide attempt First year RR=2.3 (1.5-3.3) Cervical & brain tumors
Kim et al., 2013	284 (South Korea)	Allele neurotrophic factor OR=2.56 (1.10-5.93) Depression and anxiety (OR=1.4 (1.1-1.7) Alone OR=3.6 (1.1-7.8) Advanced cancer OR=2.0 (1.1-3.7)
Leung et al., 2013	4,822 (Canada)	Problematic making decision process in Men
Balcı Şengül, Kaya, Şen, & Kaya, 2014	102 (Turkey)	Illness stage, Depression, Anxiety
Brinkman et al., 2013	9,128 (USA)	Poor health OR=1.9 (1.3-2.7) Depression OR=3.0 (2.1-4.1)
Choi et al., 2014	378 (South Korea)	Diarrhea OR= 2.8(1.4-5.6) Alopecia OR=2.8 (1.0-7.4) Fatigue OR= 2.3 (1.3-4.1)
Costantini et al., 2014	136 (Italy)	Lung cancer Hopelessness (t=2.54;p=.005) Depression (t=5.30; p=.001)





**TABLE II. Suicidal ideation and suicide attempt in oncologic patients (continuation)**

AUTHOR/YEAR	PARTICIPANTS/ COUNTRY	RISK FACTORS
Fang et al., 2014	200 (Australia)	Desmoralization (t = 2.84, p < 0.01)
Lehluante & Fransson, 2014	3,512 (Sweden)	QOL, Pain, Single
Mohammadi et al. 2014	46,309 (Sweden)	Suicide attempts Myeloma IRR=2.1(1.4-3.3) Linfoma IRR= 1.3 (1.1-1.7)
Trevino, Balboni, Zollfrank, Balboni, & Prigerson, 2014	603 (USA)	Non-religious OR=3.67 (1.84-7.32) Metastasis OR=1.80 (1.03-3.15) Negative religious adaptation OR=2.7 (1.2-5.7) Physical symptoms OR=1.2 (1.1-1.3) Major depression OR=3.4 (1.8- 6.7) PTSD OR=6.4 (2.3-17.3)
Trevino, Abbott, et al., 2014	93 (USA)	Physical symptoms OR=1.3 (1.0-1.5) Major depression OR=6.4 (1.6-25.6) PTSD OR=5.0 (1.0-24.6) Low thereapeutic adherence OR=.26 (.07- .97)
Tanriverdi, Cuhadar, & Ciftci, 2014	105 (Turkey)	34.3% of patients thought of suicide
Eskelinen et al. 2015	115 (Finland)	Hopelessness, negativity, frustration
Jokinen et al. 2015	186,627 (Sweden)	Pharynx SIR=2.9 (2.2-3.8) LarinxSIR= 4.6 (3.3-6.3) Women Oral SIR=3.3 (2.6-4.1) Men Liver SIR=3.3 (2.7-3.8) Men.
(Hultcrantz et al. 2015	47,220 (Sweden)	Myeloma Multiple HR =3.4(2.3-5.0) Psychiatric history HR=23.3 (16.6-32.6) Age ≤ 69 years. HR=1.9 (1.5-2.5)
Zhou, Hu, Kantoff, & Recklitis, 2015	656 (USA)	Age OR= .98 seniors Etnia OR=1.47 Divorced OR= 1.58 No previous oncology doctor visit 1 year OR=2.57
<b>IBEROAMERICA</b>		
Vargas-Mendoza, 2010	10 (Mexico)	Higher suicide ideation in women
Botega et al. 2010	671 (Brasil)	Women OR= 5.6; 95% CI: 4.6-6. Age OR= 8.3 young patients Alcohol OR= 2.3 Tobacco OR= 1.8
Díaz-Frutos, et al. 2015	202 (Spain)	Depression OR=3.6 (1.3-11.7) Hopelessness OR=8.8 (3.4-25.9) Personality traits OR=.44 (.2-.96) Age >60 OR= 2.6 (1.2-6.0)
SMR, standardized mortality ratio; OR, Odds ratios; RR, relative risk; SIR, standardized incidence ratios; IRR, incidence rate ratio.		



port have higher risk of suicide and violent methods (Chun & Lin, 2010; Kendal, 2007; Lin, Wu, & Lee, 2009; Panczak et al., 2013; Robinson et al., 2009). The first year of diagnosis is extremely crucial (Dormer et al., 2008; Hem et al., 2004; Mahdi et al., 2011; Robinson et al., 2009) especially with advanced cancer (Alanee & Russo, 2012; Fang et al., 2012; Mahdi et al., 2011; Yamauchi et al. 2014) and other medical illnesses (Bolton, Walld, Chateau, Finlayson, & Sareen, 2015) or mental health illnesses (Fang et al., 2012; Fanger et al., 2010; Hultcrantz et al. 2015; Llorente et al., 2005; Miller et al., 2008; Tseng et al. 2010). Finally, the first month after diagnosis is a crucial moment for preventive propose or treatment (Holland & Alici, 2010; Miovic & Block, 2007; Misono, Weiss, Fann, Redman, & Yueh, 2008; Robson, Scrutton, Wilkinson, & MacLeod, 2010).

#### Suicidal ideation in oncologic patients

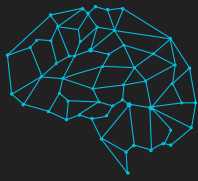
This review shows that 30.7% of the articles are from the USA, 42.3% Europe, 11.5% Asia and 7.7% Iberoamerica (Table II). The prevalence of suicidal ideation in oncologic patients in the USA is around 17.7% (Schneider & Shenassa, 2008). In Europe between a 7%- 25% of the patients had suicidal ideation (Costantini et al., 2014; Eskelinen, Korhonen, Selander, & Ollonen, 2015; Jokinen, Mattsson, Lagergren, Lagergren, & Ljung, 2015; Spencer, Ray, Pirl, & Prigerson, 2012; Walker et al., 2008; Díaz-Frutos, Baca-García, Mahillo-Fernández, García-Foncillas & López-Castroman, 2015), in Mexico was around a 20% (Vargas-Mendoza, 2010) and Brasil a 7 % (Bottega et al., 2010; Fanger et al., 2010).

As it happens with completed suicide, there is a higher risk of suicidal ideation in determined types of tumor such as brain, lung, pancreas, breast, prostate and liver (Aketchi, et al., 2010; Jokinen et al. 2015; Kendal & Kendal, 2015; Recklitis, et al. 2010; Spencer, et al. 2012). Age, gender, socioeconomic status, ... are as well as relevant risk factors that may undermine patients' alternatives for seeking or receiving treatment (Akechi et al., 2010; Kim, Jang, Stewart, Kim, Kim, Kang, et al., 2013; Lehuluante & Fransson, 2014; Rasic, Belik, Bolton, Chochinov & Sareen, 2008; Recklitis et al., 2010). Finally, mental health issues, such as depression and hopelessness (Díaz-Frutos, et al. 2015; Kim et al., 2013; Rasic et al., 2008; Spencer et al., 2012) or the worsening of quality of life (Lehuluante & Fransson, 2014; Fang, et al. 2014; Rasic et al., 2008; Recklitis et al., 2010) are high risk factors for suicidal ideation.

#### DISCUSSION

Oncologic patients have approximately twice of risk of suicide behaviors than the general population, overall patients with lung, pancreas, prostate, stomach, breast and head and neck cancers (Misono et al., 2008; Robson et al., 2010). The completed suicide rates ranged from 1.2 to 16 from different countries, noticing most studies are from the USA and that Scandinavian and Easteer European countries show the highest levels of suicide behaviours. It is evident in the general population (Nock et al., 2008; Nock et al., 2010) and in oncologic patients, that most of the risk factors of suicide behaviors are shared such as adult age, single status, low economical and educative status, psychiatric history or psychological factors (hopelessness, anxiety, depression, etc) or gender, affecting the making decisions process. Furthermore that completed suicide is not always conscutive to suicidal ideation, when those risk factors are taken into consideration (Aketchi, et al. 2010; Kendal et al. 2007). For instance, when men used more aggressive methods to complete the act of suicide they do not always process thoughts or emotions (suicidal ideation) to make the decision, impulsivity may prevail (Chung & Lin, 2010). The review has established that the 5 years after cancer diagnosis, patients have more risk of suicide behaviors specially during the diagnosis and the last phase of life, advanced cancer patients may show high levels of psychological distress when receiving palliative treatments or lacking palliative care on different areas (Camidge et al., 2007). We found that most of the published data are from english speaking countries, USA and North european countries tend to produce more works and take higher interest on the health system costs and investments (García-Conde, Ibáñez-Guerra, & Durá-Ferrandis, 2008) hence the productivity of iberoamerican countries is very limited, however social health systems and family support may be affecting their results (Palacios-Espinosa & Ocampo-Palacio, 2011). These findings highlight the need for professionals to have a better understanding of differences between countries so that they can identify the risk factors in different populations that are migrating. And to ensure quality in their treatments when considering the patients needs.

The literature is not conclusive as to the effects of suicide behaviors in cancer. Many studies use collected data from national registers: Surveillance, Epidemiology, and End Results (SEER), and deaths or risk factors are not accurately classified. Because of the diverse methodology reviewed, it was not

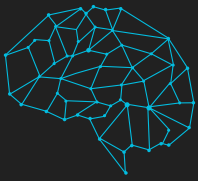


possible to use formal criteria to classify the assessment tools and how they affected the studies' results. Furthermore, we included studies with different sample sizes ranging from 10, to which is important caution when interpreting the data. We have found more data about marital status, socioeconomic factors, ethnicity and mental health issues than in previous

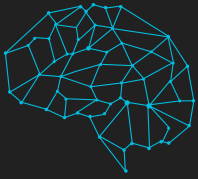
studies (Robson, et al. 2010). Our data suggest that the experiences of oncologic patients deserves further attention, particularly to provide appropriate interventions. The role of psychological factors and comorbidity invites further investigation to elucidate the relationship between physical and psychiatric illnesses.

## BIBLIOGRAFÍA

1. Aghanwa, H. The determinants of attempted suicide in a general hospital setting in fiji islands: A gender-specific study. *General hospital psychiatry* 2004;26(1):63-9.
2. Ahn E, Shin DW, Cho S, Park S, Won Y, Yun Y. Suicide rates and risk factors among korean cancer patients, 1993-2005. *Cancer Epidemiology Biomarkers & Prevention* 2010;19(8):2097-105.
3. Akechi T, Okamura H, Nakano T, Akizuki N, Okamura M, Shimizu K, Uchitomi Y. Gender differences in factors associated with suicidal ideation in major depression among cancer patients. *Psycho-oncology* 2010;19(4):384-9. doi: 10.1002/pon.1587
4. Alane S, Russo P. Suicide in men with testis cancer. *European journal of cancer care* 2012;21(6):817-21.
5. Balci Şengül M, Kaya V, Şen C, Kaya K. Association between suicidal ideation and behavior, and depression, anxiety, and perceived social support in cancer patients. *Medical science monitor: international medical journal of experimental and clinical research* 2014;20:329.
6. Beautrais AL. Suicide and serious suicide attempts in youth: A multiple-group comparison study. *The American Journal of Psychiatry* 2003;160(6):1093-9.
7. Bill-Axelsson A, Garmo H, Lambe M, Bratt O, Adolfsson J, Nyberg U, Stattin P. Suicide risk in men with prostate-specific antigen-detected early prostate cancer: A nationwide population-based cohort study from pbase sweden. *European urology* 2010;57(3):390-5.
8. Björkenstam C, Edberg A, Ayoubi S, Rosén M. Are cancer patients at higher suicide risk than the general population? A nationwide register study in sweden from 1965 to 1999. *Scandinavian journal of public health* 2005;33(3):208-14.
9. Bolton JM, Walld R, Chateau D, Finlayson G, Sareen J. Risk of suicide and suicide attempts associated with physical disorders: A population-based, balancing score-matched analysis. *Psychological medicine* 2015;45(03):495-504.
10. Botega NJ, Soares de Azevedo RC, Mauro ML, Mitsushashi G, Fanger P, Lima D, et al. Factors associated with suicide ideation among medically and surgically hospitalized patients. *General hospital psychiatry* 2010;32(4):396-400. doi: 10.1016/j.genhosppsych.2010.02.004
11. Brinkman T, Liptak C, Delaney B, Chordas C, Muriel A, Manley P. Suicide ideation in pediatric and adult survivors of childhood brain tumors. *Journal of neuro-oncology* 2013;113(3):425-32.
12. Camidge DR, Stockton DL, Frame S, Wood R, Bain M, Bateman DN. Hospital admissions and deaths relating to deliberate self-harm and accidents within 5 years of a cancer diagnosis: A national study in scotland, uk. *British journal of cancer* 2007;96(5): 752-7.
13. Carlsson S, Sandin F, Fall K, Lambe M, Adolfsson J, Stattin P, Bill-Axelsson A. Risk of suicide in men with low-risk prostate cancer. *European Journal of Cancer* 2013;49(7):1588-99.
14. Carroll-Ghosh T, Víctor BS, Bourgeois JA. (2003). Suicide. In R. E. Hales, Yudofsky, S.C. (Ed.), *The american psychiatric publishing textbook of clinical psychiatry*. Washington D.C: American Psychiatric Publishing, Inc.
15. Cole TB, Bowling JM, Patetta MJ, Blazer DG. Risk factors for suicide among older adults with cancer. *Aging & mental health*, 2014;18(7):854-60.
16. Conwell Y, Duberstein P, Hirsch J, Conner K, Eberly S, Caine E. Health status and suicide in the second half of life. *International journal of geriatric psychiatry*, 2010;25(4):371-79.
17. Costantini A, Pompili M, Innamorati M, Zezza MC, Di Carlo A, Sher L, Girardi P. Psychiatric pathology and suicide risk in patients with cancer. *Journal of psychosocial oncology*, 2014;32(4):383-95. doi: 10.1080/07347332.2014.917136
18. Crocetti E, Buzzoni C, Caldarella A, Intrieri T, Manneschi G, Sacchetti C, et al. [suicide mortality among cancer patients]. *Epidemiologia e prevenzione*, 2011;36(2):83-7.
19. Chang C, Hayes RD, Broadbent MTM, Hotopf M, Davies E, Möller H, Stewart R. A cohort study on mental disorders, stage of cancer at diagnosis and subsequent survival. *BMJ Open*, 2014;4(1). doi: 10.1136/bmjopen-2013-004295
20. Chochinov HM. Depression in cancer patients. *The lancet oncology*, 2001;2(8):499-505.
21. Choi YN, Kim Y, Yun Y, Kim S, Bae JM, Kim Y, et al. Suicide ideation in stomach cancer survivors and possible risk factors. *Supportive care in cancer*, 2014;22(2):331-7.
22. Christensen M, Yousaf U, Engholm G, Storm H. Increased suicide risk among danish women with non-melanoma skin cancer, 1971-1999. *European journal of cancer prevention*, 2006;15(3):266-8.
23. Chung KH, Lin HC. Methods of suicide among cancer patients: A nationwide population based study. *Suicide and Life-Threatening Behavior*, 2010;40(2):107-14.
24. De la Grandmaison GL, Watier L, Cavard S, Charlier P. Are suicide rates higher in the cancer population? An investigation using forensic autopsy data. *Medical Hypotheses*, 2014;82(1):16-9. doi: 10.1016/j.mehy.2013.10.025
25. Díaz-Frutos D, Baca-García E, Mahillo-Fernández I, García-Foncillas J, López-Castroman I. Suicide ideation among oncologic patients in a Spanish ward. *Psychology, Health and Medicine*, 2015;21:261-71. doi: 10.1080/13548506.2015.1058960
26. Díaz-Frutos D, Baca-García E, García-Foncillas JI, López-Castroman I. Predictors of psychological distress in advanced cancer patients under palliative treatments. *European Journal of Cancer Care*. 2016;25:608-15. Doi: 10.1111/ecc.12521



27. Dormer N, McCaul K, Kristjanson L. Risk of suicide in cancer patients in western australia, 1981-2002. *Medical Journal of Australia*, 2008;188(3):140-3.
28. Eskelinen M, Korhonen R, Selander T, Ollonen P. Suicidal ideation versus hopelessness/helplessness in healthy individuals and in patients with benign breast disease and breast cancer: A prospective case-control study in finland. *Anticancer Research*, 2015;35(6):3543-51.
29. Fall K, Fang F, Mucci L, Ye W, Andrén O, Johansson J, et al. Immediate risk for cardiovascular events and suicide following a prostate cancer diagnosis: Prospective cohort study. *PLoS medicine*, 2009;6(12):1365.
30. Fang Chang M, Chen P, Lin C, Chen G, Lin J, et al. A correlational study of suicidal ideation with psychological distress, depression, and demoralization in patients with cancer. *Supportive care in cancer*, 2014;22(12):3165-74.
31. Fang F, Fall K, Mittleman M, Sparén P, Ye W, Adami H, Valdimarsdóttir U. Suicide and cardiovascular death after a cancer diagnosis. *New England Journal of Medicine* 2012;366(14):1310-8.
32. Fang F, Keating N, Mucci L, Adami H, Stampfer M, Valdimarsdóttir U, Fall K. Immediate risk of suicide and cardiovascular death after a prostate cancer diagnosis: Cohort study in the united states. *Journal of the National Cancer Institute*, 2010;102(5):307-314.
33. Fanger P, Cruz Soares de Azevedo R, Fabrício Mauro ML, Dantas Lima D, Gaspar KC, Franco da Silva V, Botega-Wagner NJ. Depressão e comportamento suicida em pacientes oncológicos hospitalizados: Prevalência e fatores associados. *Revista da Associação Médica Brasileira*, 2010;56(2):173-8.
34. García-Conde A, Ibáñez-Guerra E, Durá-Ferrandis E. Análisis del contenido de la revista "psycho-oncology": El desarrollo de la investigación en psicooncología. *Boletín de psicología* 2008;(92):81-113.
35. Hem E, Loge J, Haldorsen T, Ekeberg Ø. Suicide risk in cancer patients from 1960 to 1999. *Journal of Clinical Oncology*, 2004;22(20):4209-16.
36. Holland JC, Alici Y. Management of distress in cancer patients. *Journal of Supportive Oncology* 2010;8(1):4-12.
37. Hoven CW, Mandell DJ, Bertolote JM. Prevention of mental ill-health and suicide: Public health perspectives. *European psychiatry : the journal of the Association of European Psychiatrists*, 2010;25(5):252-6.
38. Hultcrantz M, Svensson T, Derolf Å, Kristinsson S, Lindqvist E, Ekbohm A, et al. Incidence and risk factors for suicide and attempted suicide following a diagnosis of hematological malignancy. *Cancer medicine*, 2015;4(1):147-54.
39. Johnson T, Garlow S, Brawley OW, Master VA. Peak window of suicides occurs within the first month of diagnosis: Implications for clinical oncology. *Psycho-Oncology*, 2012;21(4):351-6.
40. Jokinen J, Mattsson F, Lagergren K, Lagergren J, Ljung R. Suicide attempt and future risk of cancer: A nationwide cohort study in sweden. *Cancer Causes & Control*, 2015;26(3):501-9.
41. Kendal W. Suicide and cancer: A gender-comparative study. *Annals of oncology*, 2007;18(2): 381-7.
42. Kendal W, Kendal W. Comparative risk factors for accidental and suicidal death in cancer patients. *Crisis*. 2012.
43. Kim JM, Jang JE, Stewart R, Kim S, Kim S, Kang HJ, Yoon JH. Determinants of suicidal ideation in patients with breast cancer. *Psycho Oncology*, 2013;22(12):2848-56.
44. Kim Y, Lee K. Relationship of social support and meaning of life to suicidal thoughts in cancer patients. *Journal of Korean Academy of Nursing*, 2010;40(4):524-32.
45. Lehluante A, Fransson P. Are there specific health-related factors that can accentuate the risk of suicide among men with prostate cancer? *Supportive care in cancer*, 2014;22(6):1673-8.
46. Leung Y, Li M, Devins G, Zimmermann C, Rydall A, Lo C, Rodin G. Routine screening for suicidal intention in patients with cancer. *Psycho Oncology*, 2013;22(11):2537-45.
47. Lin HC, Wu CH, Lee HC. Risk factors for suicide following hospital discharge among cancer patients. *Psycho-Oncology*, 2009;18(10):1038-1044.
48. Lu D, Fall K, Sparen P, Ye W, Adami HO, Valdimarsdóttir U, Fang F. Suicide and suicide attempt after a cancer diagnosis among young individuals. *Annals of oncology*, 2013;24(12):3112-7. doi: 10.1093/annonc/mdt415
49. Llorente M, Burke M, Gregory G, Bosworth H, Grambow S, Horner R, et al. Prostate cancer: A significant risk factor for late-life suicide. *The American Journal of Geriatric Psychiatry*, 2005;13(3):195-201.
50. Madeira N, Albuquerque E, Santos T, Mendes A, Roque M. Death ideation in cancer patients: Contributing factors. *Journal of psychosocial oncology*, 2011;29(6):636-42.
51. Mahdi H, Swensen R, Munkarah A, Chiang S, Luhrs K, Lockhart D, Kumar S. Suicide in women with gynecologic cancer. *Gynecologic oncology*, 2011;122(2):344-9.
52. Malvezzi M, Bertuccio P, Levi F, La Vecchia C, Negri E. European cancer mortality predictions for the year 2013. *Annals of oncology*. 2013. doi: 10.1093/annonc/mdt010
53. Massie MJ. Prevalence of depression in patients with cancer. *Journal of National Cancer Institute Monographs* 2004;(32):57-71. doi: 10.1093/jnci-monographs/lgh014
54. Miccinesi G, Crocetti E, Benvenuti A, Paci E. Suicide mortality is decreasing among cancer patients in central italy. *European Journal of Cancer*, 2004;40(7):1053-7.
55. Miller M, Mogun H, Azrael D, Hempstead K, Solomon D. Cancer and the risk of suicide in older americans. *Journal of Clinical Oncology*, 2008;26(29):4720-4.
56. Miovic M, Block S. Psychiatric disorders in advanced cancer. *Cancer*, 2007;110(8):1665-76. doi: 10.1002/cncr.22980
57. Misono S, Weiss NS, Fann JR, Redman M, Yueh B. Incidence of suicide in persons with cancer. *Journal of Clinical Oncology*, 2008;26(29):4731-8. doi: 10.1200/jco.2007.13.8941
58. Mitchell AJ, Chan M, Bhatti H, Halton M, Grassi L, Johansen C, Meader N. Prevalence of depression, anxiety, and adjustment disorder in oncological, haematological, and palliative-care settings: A meta-analysis of 94 interview-based studies. *Lancet Oncology*, 2011;12(2):160-174. doi: 10.1016/s1470-2045(11)70002-x
59. Mohammadi M, Moradi T, Bottai M, Reutfors J, Cao Y, Smedby K. Risk and predictors of attempted and completed suicide in patients with hematological malignancies. *Psycho Oncology*, 2014;23(11):1276-82.
60. Nakash O, Barchana M, Liphshitz I, Keinan-Boker L, Levav I. The effect of cancer on suicide in ethnic groups with a differential suicide risk. *The European Journal of Public Health*, cks045. 2012.
61. Nakash O, Liphshitz I, Keinan-Boker L, Levav I. The effect of cancer on suicide among elderly holocaust survivors. *Suicide and Life-Threatening Behavior*, 2013;43(3):290-5.
62. Nock M, Borges G, Bromet E, Alonso J, Angermeyer M, Beautrais A, et al. Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *The British Journal of Psychiatry*, 2008;192(2):98-105.
63. Nock M, Hwang I, Sampson N, Kessler R. Mental disorders, comorbidity and suicidal behavior: Results from the national comorbidity survey replication. *Molecular psychiatry*, 2010;15(8):868-76.



64. Palacios-Espinosa X, Ocampo-Palacio JG. Situación actual del conocimiento acerca del suicidio en las personas con cáncer. *Revista Ciencias de la Salud*, 2011;9(2):173-190.
65. Panczak R, Spoerri A, Zwahlen M, Bopp M, Gutzwiller F, Egger M. Religion and suicide in patients with mental illness or cancer. *Suicide and Life-Threatening Behavior*, 2013;43(2):213-22.
66. Passik SD, Theobald DE. Managing addiction in advanced cancer patients: Why bother? *J Pain Symptom Manage*, 2000;19(3):229-34.
67. Quill TE. Suicidal thoughts and actions in cancer patients: The time for exploration is now. *Journal of Clinical Oncology*, 2008;26(29):4705-7. doi: 10.1200/jco.2008.18.3129
68. Rasic DT, Belik SL, Bolton JM, Chochinov HM, Sareen J. Cancer, mental disorders, suicidal ideation and attempts in a large community sample. *Psycho-Oncology*, 2008;17(7):660-7.
69. Recklitis Lockwood R, Rothwell M, Diller L. Suicidal ideation and attempts in adult survivors of childhood cancer. *Journal of Clinical Oncology*, 2006;24(24):3852-7.
70. Recklitis CJ, Diller LR, Li X, Najita J, Robison LL, Zeltzer L. Suicide ideation in adult survivors of childhood cancer: A report from the childhood cancer survivor study. *Journal of Clinical Oncology*, 2010;28(4):655-61. doi: 10.1200/jco.2009.22.8635
71. Robinson D, Renshaw C, Okello C, Möller H, Davies E. Suicide in cancer patients in south east england from 1996 to 2005: A population-based study. *British journal of cancer*, 2009;101(1):198-201.
72. Robson A, Scrutton F, Wilkinson L, MacLeod F. The risk of suicide in cancer patients: A review of the literature. *Psychooncology*, 2010;19(12):1250-8. doi: 10.1002/pon.1717
73. Schairer C, Brown L, Chen B, Howard R, Lynch C, Hall P, et al. Suicide after breast cancer: An international population-based study of 723 810 women. *Journal of the National Cancer Institute*, 2006;98(19):1416-19.
74. Schneider KL, Shenassa E. Correlates of suicide ideation in a population-based sample of cancer patients. *Journal of psychosocial oncology*, 2008;26(2):49-62. doi: 10.1300/J077v26n02\_04
75. Smalilyte G, Jasilionis D, Kaceniene A, Krilaviciute A, Ambrozaitiene D, Stankuniene V. Suicides among cancer patients in lithuania: A population-based census-linked study. *Cancer epidemiology*, 2013;37(5):714-8. doi: 10.1016/j.canep.2013.05.009
76. Spencer R, Ray A, Pirl W, Prigerson H. Clinical correlates of suicidal thoughts in patients with advanced cancer. *The American Journal of Geriatric Psychiatry*, 2012;20(4):327-36.
77. Spoletini I, Gianni W, Caltagirone C, Madaio R, Repetto L, Spalletta G. Suicide and cancer: Where do we go from here? *Critical Reviews in Oncology/Hematology*, 2011;78(3):206-19. doi: 10.1016/j.critrevonc.2010.05.005
78. Sudak HD. Suicide. In B. J. Sadock, Sadock, C.V.A. (Eds.) (Ed.), *Kaplan and sadock's comprehensive textbook of psychiatry (8th Edition ed.)*. Philadelphia: Lippincott Williams and Wilkins. 2005.
79. Tanriverdi D, Cuhadar D, Ciftci S. Does the impairment of functional life increase the probability of suicide in cancer patients? *Asian Pacific journal of cancer prevention: APJCP*, 2014;15(21):9549-53.
80. Torre LA, Bray F, Siegel RL, Ferlay J, Lortet Tieulent J, Jemal, A. *Global cancer statistics, 2012*. CA: a cancer journal for clinicians, 2015;65(2):87-108.
81. Trevino K, Abbott C, Fisch M, Friedlander R, Duberstein P, Prigerson H. Patient-oncologist alliance as protection against suicidal ideation in young adults with advanced cancer. *Cancer*, 2014;120(15):2272-81.
82. Trevino K, Balboni M, Zollfrank A, Balboni T, Prigerson H. Negative religious coping as a correlate of suicidal ideation in patients with advanced cancer. *Psycho-Oncology*, 2014;23(8):936-45.
83. Tseng KC, Chang CM, Liao SC, Chen YY, Lee MB. Factors of early suicide after discharge: A national linkage study for suicide victims in taiwan. *Suicide and Life-Threatening Behavior*, 2010;40(4):353-68.
84. Turaga K, Malafa M, Jacobsen P, Schell M, Sarr M. Suicide in patients with pancreatic cancer. *Cancer*, 2011;117(3):642-47.
85. Vargas-Mendoza J. Evaluación de la ideación suicida en pacientes con cáncer sometidos a quimioterapia. *Centro Regional de Investigación en Psicología*, 2010;4(1):19-23.
86. Vyssoki B, Gleiss A, Rockett I, Hackl M, Leitner B, Sonneck G, Kapusta N. Suicide among 915,303 austrian cancer patients: Who is at risk? *Journal of affective disorders*, 2015;175:287-91.
87. Walker J, Hansen C, Martin P, Symeonides S, Ramessur R, Murray G, Sharpe M. Prevalence, associations, and adequacy of treatment of major depression in patients with cancer: A cross-sectional analysis of routinely collected clinical data. *The Lancet Psychiatry*, 2014;1(5):343-50.
88. Walker J, Waters RA, Murray G, Swanson H, Hibberd CJ, Rush RW, et al. Better off dead: Suicidal thoughts in cancer patients. *Journal of Clinical Oncology*, 2008;26(29):4725-30. doi: 10.1200/jco.2007.11.8844
89. Ward K, Roncancio A, Plaxe S. Women with gynecologic malignancies have a greater incidence of suicide than women with other cancer types. *Suicide and Life-Threatening Behavior*, 2013;43(1):109-15.
90. Weinberger MI, Bruce ML, Roth AJ, Breitbart W, Nelson CJ. Depression and barriers to mental health care in older cancer patients. *International journal of geriatric psychiatry*, 2011;26(1):21-26. doi: 10.1002/gps.2497
91. Yamauchi T, Inagaki M, Yonemoto N, Iwasaki M, Inoue M, Akechi T, et al. Death by suicide and other externally caused injuries following a cancer diagnosis: The japan public health center based prospective study. *Psycho Oncology*, 2014;23(9):1034-41.
92. Yousaf U, Christensen M, Engholm G, Storm H. Suicides among danish cancer patients 1971-1999. *British journal of cancer*, 2005;92(6):995-1000.
93. Zebrack B, Ell K, Smith W. Suicide risk in childhood cancer survivors. *Journal of Clinical Oncology*, 2007;25(6):732-3.
94. Zhou E, Hu J, Kantoff P, Recklitis C. Identifying suicidal symptoms in prostate cancer survivors using brief self-report. *Journal of Cancer Survivorship*, 2015;9(1):59-67.