

1 **Title:** The Prevalence of Depression in General Hospital Inpatients: A Systematic Review and
2 Meta-Analysis of Interview Based Studies

3

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26

27 **ABSTRACT**

28 **Background**

29 Comorbid depression in the medically ill is clinically important. Admission to a general
30 hospital offers an opportunity to identify and initiate treatment for depression. However we
31 first need to know how common depression is in general hospital inpatients. We aimed to
32 address this question by systematically reviewing the relevant literature.

33

34 **Methods**

35 We reviewed published prevalence studies in any language which had used diagnostic
36 interviews of general hospital inpatients and met basic methodological quality criteria. We
37 focussed on interview-based studies in order to estimate the proportion of patients with a
38 diagnosis of depressive illness.

39

40 **Results**

41 Of 158 relevant articles, 65 (41%) describing 60 separate studies met our inclusion criteria.
42 The 31 studies that focussed on general medical and surgical inpatients reported prevalence
43 estimates ranging from 5% to 34%. There was substantial, highly statistically significant,
44 heterogeneity between studies which was not materially explained by the covariates we
45 were able to consider. The average of the reported prevalences was 12% (95% C.I. 10% to
46 15%), with a 95% prediction interval of 4% to 32%. The remaining 29 studies, of a variety of
47 specific clinical populations, are described.

48

49 **Conclusions**

50 The available evidence suggests a likely prevalence high enough to make it worthwhile
51 screening hospital inpatients for depression and initiating treatment where appropriate.
52 Further, higher quality, research is needed to clarify the prevalence of depression in specific
53 settings and to further explore the reasons for the observed heterogeneity in estimates.

54 **INTRODUCTION**

55 Depression frequently accompanies physical illness (Vos *et al.*, 2012). It is clinically
56 important because it is associated with worse physical symptoms, poorer quality of life and
57 greater functional disability (Egede, 2007, Katon, 1996). Patients with depression also spend
58 more time in hospital, are less likely to adhere to medical treatments, and consequently
59 incur higher healthcare costs (DiMatteo *et al.*, 2000). Despite its importance the
60 management of depression comorbid with physical illness is often suboptimal with low rates
61 of detection and treatment (Balestrieri *et al.*, 2002, Cepoiu *et al.*, 2008, Hirschfeld *et al.*,
62 1997, Katon and Sullivan, 1990, Kessler *et al.*, 1999, Walker *et al.*, 2014).

63

64 Admission to a general hospital therefore provides an important opportunity to improve the
65 management of comorbid depression. Detection can be improved by incorporating
66 systematic screening into hospital admission procedures and treatment can be initiated
67 where appropriate (Beach *et al.*, 2015). However, in order to plan such a management
68 strategy we need to know how common depression is in general hospital inpatients.

69 Surprisingly, we currently lack a clear answer to this basic question. This is largely because
70 previous systematic reviews of the prevalence of depression have focussed on study
71 populations with specific physical diseases such as cancer, rather than on specific clinical
72 settings such as general hospital wards (Castro-de-Araujo *et al.*, 2013, Craig *et al.*, 2009,
73 Davydow *et al.*, 2009, Delville and McDougall, 2008, Kouwenhoven *et al.*, 2011, Mitchell *et*
74 *al.*, 2011, Poynter *et al.*, 2009, Shanmugasegaram *et al.*, 2012, Singer *et al.*, 2013, Thombs *et*
75 *al.*, 2006a, Thombs *et al.*, 2006b, Walker *et al.*, 2013, Wilder Schaaf *et al.*, 2013, Wiseman *et*
76 *al.*, 2013).

77

78 We therefore aimed to conduct a systematic review of studies of the prevalence of
79 depression in general hospital inpatients. We focussed on interview-based studies in order
80 to estimate the proportion of patients with a definite diagnosis of depressive illness.

81

82 **METHODS**

83

84 **Search strategy and selection criteria**

85 We performed a systematic review of studies of the prevalence of depression in general
86 hospital inpatients, using procedures that accorded with the PRISMA (Preferred Reporting
87 Items for Systematic Reviews and Meta-Analyses) guidelines (Moher *et al.*, 2009). We
88 identified studies by searching EMBASE, Medline and PsycINFO (from 1974, 1946 and 1967
89 respectively) to December 2015. Searches were run for the combination of 'prevalence',
90 'general hospital inpatient' and 'depression' using both standardised subject terms and free
91 text terms, including synonyms and alternative spellings. We provide full details of the
92 searches used in the online appendix. We also manually searched the reference lists of
93 review articles obtained through the electronic searches.

94

95 We judged studies to be relevant to the review if they met all the following criteria: (1) the
96 study clearly aimed to estimate the prevalence of depression (i.e. studies that were
97 designed to address a different research question but happened to include a prevalence
98 estimate, such as clinical trials or questionnaire validation studies, were not included); (2) all
99 study participants were adults (aged 16 or older); (3) all study participants (or a clearly
100 defined subgroup for which there was an estimate of depression prevalence) were general
101 hospital inpatients at the time of depression assessment; (4) the presence of depressive
102 illness was determined using a diagnostic interview. We only included primary studies (i.e.

103 not reviews) for which we could obtain the full paper to allow data extraction. No language
104 restrictions were applied.

105

106 When selecting publications to include in the review, we also applied quality criteria to the
107 reported study methods. In order to ensure a consistent and transparent approach to this
108 quality assessment we used a checklist based on the work of Loney et al (Loney *et al.*, 1998,
109 Walker *et al.*, 2013). We used a checklist rather than a continuous scale to ensure that all
110 the key aspects of the study methods met basic quality criteria (Juni *et al.*, 1999). The basic
111 methodological standards required for inclusion were: (1) the study sample was obtained
112 using a random or consecutive sampling method; (2) data were available for analysis on at
113 least 70% of the eligible patients (either as reported by the authors or derived from
114 presented data); (3) depressive illness was defined using standard diagnostic criteria: major
115 depression from the Diagnostic and Statistical Manual of Mental Disorders (DSM),
116 depressive episode from the International Classification of Diseases (ICD) or similar
117 (American Psychiatric Association, 1994, 2013, World Health Organization, 1992). The first
118 two of these criteria aimed to minimise selection bias, and the third aimed to ensure that
119 estimates could be compared across studies.

120

121 **Data collection**

122 We screened the titles and abstracts of all articles identified by the searches to determine
123 whether each might meet the selection criteria. We then reviewed the full text of the
124 article, with the help of a translator where necessary, if there was any possibility that it
125 might be relevant and would meet our quality criteria. This process (including screening of

126 titles and abstracts) was conducted independently by two researchers with reference to a
127 third researcher to resolve disagreements.

128

129 Two researchers independently extracted the following data from all the articles included in
130 the review, using a specially designed, standardised data extraction form: country in which
131 the study took place; age, sex and clinical characteristics of participants; sample size; type of
132 depression interview used and profession of interviewer; diagnostic criteria used to
133 determine the presence of depressive illness; prevalence of depression in the sample (for
134 cohort studies, we extracted the prevalence of depression at the first time point only).

135

136 **Clinical analysis**

137 Two researchers reviewed the data extracted on participants' clinical characteristics in order
138 to assess their similarity across studies. We found that there was high clinical heterogeneity,
139 indicating that a meta-analysis of all the studies would not yield meaningful results. Whilst
140 some studies had recruited general medical and surgical inpatients, others had recruited
141 inpatients with very specific clinical characteristics, and therefore were of samples
142 unrepresentative of the general hospital inpatient population. In order to deal with this
143 clinical heterogeneity, we restricted our statistical analysis to studies of general medical and
144 surgical inpatients. The studies of more specific patient groups are described in our results
145 and online appendix in order to provide the reader with a comprehensive overview of the
146 relevant literature.

147

148 **Statistical analysis**

149 We used forest plots to display the proportion (with exact binomial 95% confidence
150 intervals) of participants diagnosed with depression in each study (Newcombe, 1998).

151

152 We used random-effects models to describe the prevalence of depression in general
153 medical and surgical inpatients. This is because it is implausible that the underlying study-
154 specific prevalence of depression (i.e. the prevalence that would be observed were a study
155 of infinite size) is exactly the same for each study. Prevalence is likely to vary from study to
156 study according to factors, both measured and unmeasured, that differ between them
157 (Stroup *et al.*, 2000). Random effects models assume that the populations investigated in
158 each study are themselves drawn from a wider population of populations and that the
159 underlying study-specific prevalences in these populations therefore follow a statistical
160 distribution, rather than taking a single value.

161

162 As is common for proportions, we used the logit transformation expressing each of the
163 prevalences as a log-odds. Accordingly our random-effects models assume that the logit
164 transformed prevalences follow a normal distribution with a mean and standard deviation.

165 This mean can be thought of as a “typical” prevalence, while the standard deviation
166 quantifies the underlying between-study variability in prevalences. This variability is
167 summarised by a 95% prediction interval, which is the interval within which 95% of
168 underlying study-specific prevalences are predicted to lie (for a thorough discussion of this
169 topic see Guddat *et al.*) (Guddat *et al.*, 2012). As such it differs from a 95% confidence
170 interval which quantifies the precision of the mean of the study-specific prevalences (with
171 the mean defined after logit transformation).

172

173 We used the inverse variance method of DerSimonian and Laird to estimate between-study
174 heterogeneity in underlying depression prevalence and the I-squared measure which
175 represents the proportion of total variance attributable to this heterogeneity (Higgins *et al.*,
176 2003). The assumption that underlying prevalences are normally distributed after logit
177 transformation was not contradicted by our data.

178

179 We investigated potential sources of the heterogeneity that we observed between the
180 studies' prevalence estimates (that is, the large amount of between-study variability
181 compared with the total variability) by considering some of the known differences between
182 the studies. To this end, we inspected scatter plots of depression prevalence against year of
183 study publication, sample size, average (or other available measure for central tendency)
184 participant age, and percentage of female participants. We used forest plots to compare
185 depression prevalence in studies grouped by use of DSM major depression versus other
186 diagnostic criteria for depression, and national income of the country where the study took
187 place (we used income groupings because the studies had been done in too many different
188 countries to group by country) (The World Bank, 2015). Where evidence of an association
189 with depression prevalence was apparent, we performed a mixed-effects meta-regression
190 and present its I-squared statistic, odds ratio and p-value for the association (Thompson and
191 Higgins, 2002). We did not present funnel plots for bias assessment because in the presence
192 of heterogeneity, there is no reason to expect a funnel shape (Terrin *et al.*, 2005). Statistical
193 analysis was performed in R v3.2.2 using the "meta" package v3.8-0 (R Core Team, 2015,
194 Schwarzer *et al.*, 2014). Graphs were produced in R and Stata v14 (StataCorp, College
195 Station, TX, USA).

196

197

198 **RESULTS**

199 Our initial screening of 23,775 titles and abstracts yielded 4,161 articles for full paper
200 review. We considered 158 of these to be relevant to the review. Of these 158 articles, 65
201 (41%), describing 60 separate studies, met our quality criteria and were included (see Figure
202 1, Figure 2 and appendix) (Abiodun and Ogunremi, 1990, Aghanwa and Ndububa, 2002,
203 Alexander *et al.*, 1993, Annagür *et al.*, 2013, Arnold and Privitera, 1996, Arolt and Driessen,
204 1996, Arolt *et al.*, 1997, Atesci *et al.*, 2004, Baubet *et al.*, 2011, Blomstedt *et al.*, 1996,
205 Blumel *et al.*, 2005, Dogar *et al.*, 2008, Dyster-Aas *et al.*, 2008, Feldman *et al.*, 1987, Fenton
206 *et al.*, 1994, Fritzsche *et al.*, 2003, Hardman *et al.*, 1989, Heeren and Rooymans, 1985,
207 Hosaka *et al.*, 1999, Jenkins *et al.*, 1994, Kathol and Wenzel, 1992, Kayhan *et al.*, 2013,
208 Kigamwa, 1991, Kishi *et al.*, 1994, Koenig *et al.*, 1997, Koenig *et al.*, 1991, Koenig *et al.*, 1993,
209 Kok *et al.*, 1992, Kok *et al.*, 1995, Koroglu and Tural, 2010, Kugaya *et al.*, 2000, Kumar *et al.*,
210 2011, Lazaro *et al.*, 1991, Lazaro *et al.*, 1995, Linka *et al.*, 1999, Linka *et al.*, 2000, Lykouras
211 *et al.*, 1996, Madianos *et al.*, 2001, Marchesi *et al.*, 2004, Moayedoddin *et al.*, 2013, Nair
212 and Pillay, 1997, Ng *et al.*, 1995, O'Riordan *et al.*, 1989, Pakriev *et al.*, 2009, Palmu *et al.*,
213 2010, 2011, Petrak *et al.*, 2003, Prieto *et al.*, 2002, Regvat *et al.*, 2011, Seltzer, 1989, Sharma
214 *et al.*, 2002, Silverstone, 1996, Singer *et al.*, 2013, Snyder *et al.*, 1992, Soeiro *et al.*, 2008,
215 Starkstein *et al.*, 1988, Thalassinou *et al.*, 1992, Topitz *et al.*, 2015, Turner *et al.*, 2011,
216 Uwakwe, 2000, Wancata *et al.*, 2000, Yan *et al.*, 2013, Yellowlees *et al.*, 1987, Zhao *et al.*,
217 2014, Zhong *et al.*, 2010).

218

219 These studies had been conducted in 29 countries (see appendix for map) and had included
220 a total of 12,540 participants (median sample size 109, range 27 to 993).

221

222 A variety of interviews and associated diagnostic criteria were used. The most commonly
223 used interview (16 studies) was the Structured Clinical Interview for DSM-IV (SCID) and the
224 most commonly used diagnostic criteria (used in 47 studies) were those for DSM major
225 depression (American Psychiatric Association, 1994, First *et al.*, 1996). The majority of
226 studies (40) had employed a psychiatrist or clinical psychologist to conduct the diagnostic
227 interviews.

228

229 [Figures 1 and 2 about here]

230

231 The study sample was of general medical or surgical inpatients (or both) in 31 of the studies
232 (median sample size 215, range 65 to 993, with a total of 9,305 participants; see Table 1)
233 (Abiodun and Ogunremi, 1990, Arolt and Driessen, 1996, Arolt *et al.*, 1997, Feldman *et al.*,
234 1987, Fenton *et al.*, 1994, Hosaka *et al.*, 1999, Jenkins *et al.*, 1994, Kathol and Wenzel, 1992,
235 Kayhan *et al.*, 2013, Kigamwa, 1991, Koenig *et al.*, 1997, Koenig *et al.*, 1991, Koenig *et al.*,
236 1993, Kok *et al.*, 1992, Kok *et al.*, 1995, Koroglu and Tural, 2010, Kumar *et al.*, 2011, Lazaro
237 *et al.*, 1991, Lazaro *et al.*, 1995, Linka *et al.*, 1999, Linka *et al.*, 2000, Marchesi *et al.*, 2004,
238 Moayedoddin *et al.*, 2013, Nair and Pillay, 1997, Pakriev *et al.*, 2009, Seltzer, 1989, Sharma
239 *et al.*, 2002, Silverstone, 1996, Soeiro *et al.*, 2008, Thalassinios *et al.*, 1992, Topitz *et al.*,
240 2015, Uwakwe, 2000, Wancata *et al.*, 2000, Yan *et al.*, 2013, Zhong *et al.*, 2010). These
241 studies reported prevalence estimates for depression that ranged from 5% to 34% (see
242 Figure 3). The high heterogeneity observed between study findings (I-squared 90%)
243 indicated that no single estimate was sufficient to describe the prevalence of depression in
244 general medical and/or surgical inpatients. Our random-effects model assumed that the
245 underlying study-specific prevalences followed a normal distribution (on the log-odds scale).

246 The mean of this distribution corresponded to a prevalence of 12% (95% C.I. 10% to 15%)
247 with 95% of all populations predicted to have an underlying depression prevalence between
248 4% and 32% (the prediction interval).

249

250 [Table 1 and Figure 3 about here]

251

252 In our investigations of potential sources of this observed heterogeneity visual inspection of
253 the scatter and forest plots suggested that percentage of female participants, study sample
254 size, the income band of the country in which the study was done, and the diagnostic
255 criteria used (but not year of study publication or average participant age), may all be
256 associated with the observed prevalence of depression. We therefore tested the association
257 of these variables with depression prevalence. We found that when expressed as an odds,
258 studies with a higher percentage of female participants reported a lower prevalence of
259 depression (OR 0.82 per 10 percentage points increase in female participants, 95% C.I. 0.71
260 to 0.95, $p=0.007$). Studies with larger sample sizes reported lower prevalences (OR 0.82 per
261 doubling in size, 95% C.I. 0.68 to 0.99, $p=0.043$). There were also non-significant associations
262 with national income in the country in which the study was done ($p=0.292$), and the
263 diagnostic criteria used for depression ($p=0.154$). Notably, in all our investigations the
264 residual heterogeneity remained high (all I-squared $>88\%$, see appendix for scatter plots and
265 forest plots) meaning that a very high proportion of the heterogeneity remained
266 unaccounted for by the variables we considered.

267

268 In addition to the 31 studies of general medical and/or surgical patients, we identified 29
269 studies (median sample size 72, range 27 to 502, with a total of 3,235 participants) of

270 inpatients who were in a variety of specialist units (such as endocrinology or haematology)
271 or had very specific clinical characteristics (such as a diagnosis of systemic sclerosis)
272 (Aghanwa and Ndububa, 2002, Alexander *et al.*, 1993, Annagür *et al.*, 2013, Arnold and
273 Privitera, 1996, Atesci *et al.*, 2004, Baubet *et al.*, 2011, Blomstedt *et al.*, 1996, Blumel *et al.*,
274 2005, Dogar *et al.*, 2008, Dyster-Aas *et al.*, 2008, Fritzsche *et al.*, 2003, Hardman *et al.*, 1989,
275 Heeren and Rooymans, 1985, Kishi *et al.*, 1994, Kugaya *et al.*, 2000, Lykouras *et al.*, 1996,
276 Madianos *et al.*, 2001, Ng *et al.*, 1995, O'Riordan *et al.*, 1989, Palmu *et al.*, 2010, 2011,
277 Petrak *et al.*, 2003, Prieto *et al.*, 2002, Regvat *et al.*, 2011, Singer *et al.*, 2013, Snyder *et al.*,
278 1992, Starkstein *et al.*, 1988, Turner *et al.*, 2011, Yellowlees *et al.*, 1987, Zhao *et al.*, 2014).
279 These studies reported prevalence estimates ranging from 2% to 56%. They are described in
280 detail in the online appendix.
281

282 **DISCUSSION**

283

284 This is the first systematic review of studies of the prevalence of depression in general
285 hospital inpatients. The 60 studies that we found had been conducted in 29 countries and
286 included a total of 12,540 participants. They reported a wide range of prevalence estimates.
287 We reduced the clinical heterogeneity by focussing on the 31 studies of general medical
288 and/or surgical inpatients. However even in these studies the estimated prevalence ranged
289 from 3% to 34%. There was also a high degree of heterogeneity, indicating that even
290 'general medical and/or surgical inpatients' cannot be considered as a single population, but
291 rather as a number of different populations, each with a different prevalence of depression.
292 These populations had a median prevalence of depression of 12% and we can predict that
293 95% of them have a prevalence between 4% and 32%. This median prevalence of 12% is
294 more than twice that in the general population, for which international studies suggest an
295 average 12-month prevalence of approximately 5% (Kessler and Bromet, 2013).

296

297 Our analyses were unable to adequately explain the observed heterogeneity in prevalence
298 estimates. The only variables that we found to be significantly associated with prevalence of
299 depression were sample size and the proportion of female patients in the study samples. As
300 these explained only a trivial amount of the heterogeneity and the latter association was
301 not in the expected direction (a higher proportion of female patients was associated with a
302 lower prevalence of depression), we judge this finding to be of questionable importance.
303 Our inability to explain the observed heterogeneity indicates that it resulted from variables
304 we were unable to investigate as they had not been consistently reported in the
305 publications we reviewed. These unreported variables might be at the population,
306 healthcare system, patient or methodological level. At the population level, it is likely that

307 national and local prevalence of depression in the general population varies. At the
308 healthcare system level, hospital type (e.g. university, community), funding systems,
309 admission pathways and medical staffing vary substantially. At the patient level, it is likely
310 that the characteristics of patients admitted to general hospitals, and specifically to general
311 medical and surgical (as opposed to sub-speciality) wards varies. Methodologically, there
312 are likely to be unreported variations in how the studies were done. These include how the
313 patients were sampled (e.g. who was excluded), how the diagnosis of depression was made
314 (e.g. the details of how the diagnostic interviews were conducted, whether physical
315 symptoms were counted toward the diagnosis of depression or not and exactly how the
316 diagnostic criteria were applied) and when the assessment was done during the period of
317 hospitalisation (e.g. soon after admission or later in the stay).

318

319 This review has strengths which include: (a) The use of clearly defined inclusion criteria for
320 papers to minimise selection bias; (b) the focus on studies where the diagnosis of
321 depression was made by interview; (c) the exclusion of studies with major design flaws
322 (Moher *et al.*, 2009, Stroup *et al.*, 2000). It also has limitations which include: (a) a reliance
323 on the published reports to assess studies' relevance and quality, which may potentially
324 have led to us excluding studies that were in fact well conducted, but poorly reported; (b)
325 our inability to investigate all potential sources of heterogeneity because of the limited
326 potentially relevant data reported in the publications we reviewed.

327

328 Given the importance of the question we addressed in this review, we found a remarkably
329 small literature, much of which was published some time ago. Furthermore, our quality
330 assessments indicated that much of that literature was of poor quality. Common

331 shortcomings were poor sampling strategies and the use of unclear case definitions for
332 depressive disorder. Even the methodologically better studies selected for inclusion in this
333 review were mostly small in size (median sample size 109) by epidemiological standards.
334 There is consequently a clear and pressing need for better quality studies of the prevalence
335 of depression in medical inpatients. If these are to inform service planning these should aim
336 both to determine the prevalence of depression in specific settings (such as National Health
337 Service hospitals in the UK) and to clarify the determinants of the substantial apparent
338 variations in prevalence noted in this review. Suggestions for the design of future studies
339 are given in Table 2.

340

341 [Table 2 about here]

342

343 Despite the limitations of the available evidence we can reasonably conclude that
344 depression is sufficiently common in medical inpatients to make planning for its systematic
345 management worthwhile. This management should include systematic identification of
346 depression during hospital admissions, monitoring of depression once identified (during the
347 hospital admission and thereafter, to determine whether it resolves post-discharge) and the
348 initiation of treatment when it is persistent (Kathol and Wenzel, 1992, Mayou *et al.*, 1988).
349 Few hospitals currently have such systems. The approach we have tested for depression
350 management in cancer patients provides a potential model for how we might improve
351 depression care in all medical settings (Walker and Sharpe, 2014).

352

353

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360

361 **CONFLICTS OF INTEREST**

362 None.

363

REFERENCES

- Abiodun OA, Ogunremi OO** (1990). Psychiatric morbidity in medical and surgical wards of a Nigerian general hospital. *Journal of Psychosomatic Research* **34**, 409-414.
- Aghanwa HS, Ndububa D** (2002). Specific psychiatric morbidity in liver cirrhosis in a Nigerian general hospital setting. *General Hospital Psychiatry* **24**, 436-441.
- Alexander PJ, Dinesh N, Vidyasagar M** (1993). Psychiatric morbidity among cancer patients and its relationship with awareness of illness and expectations about treatment outcome. *Acta Oncologica* **32**, 623-626.
- American Psychiatric Association** (1994). *Diagnostic and Statistical Manual of Mental Disorders 4th edition, DSM-IV*. American Psychiatric Association.
- American Psychiatric Association** (2013). *Diagnostic and Statistical Manual of Mental Disorders fifth edition, DSM-5*. American Psychiatric Association.
- Annagür BB, Tazegül A, Gündüz S** (2013). Do psychiatric disorders continue during pregnancy in women with hyperemesis gravidarum: a prospective study. *General Hospital Psychiatry* **35**, 492-496.
- Arnold LM, Privitera MD** (1996). Psychopathology and trauma in epileptic and psychogenic seizure patients. *Psychosomatics* **37**, 438-443.
- Arolt V, Driessen M** (1996). Alcoholism and psychiatric comorbidity in general hospital inpatients. *General Hospital Psychiatry* **18**, 271-277.
- Arolt V, Driessen M, Dilling H** (1997). The Lubeck General Hospital Study. I: Prevalence of psychiatric disorders in medical and surgical inpatients. *International Journal of Psychiatry in Clinical Practice* **1**, 207-216.
- Atesci FC, Baltalarli B, Oguzhanoglu NK, Karadag F, Ozdel O, Karagoz N** (2004). Psychiatric morbidity among cancer patients and awareness of illness. *Supportive Care In Cancer* **12**, 161-7.
- Balestrieri M, Bisoffi G, Tansella M, Martucci M, Goldberg DP** (2002). Identification of depression by medical and surgical general hospital physicians. *General Hospital Psychiatry* **24**, 4-11.
- Baubet T, Ranque B, Taïeb O, Bérezné A, Bricou O, Mehallel S, Moroni C, Belin C, Pagnoux, C, Moro MR** (2011). Mood and anxiety disorders in systemic sclerosis patients. *La Presse Médicale* **40**, e111-e119.
- Beach SR, Walker J, Celano CM, Mastromauro CA, Sharpe M, Huffman JC** (2015). Implementing collaborative care programs for psychiatric disorders in medical settings: a practical guide. *Gen Hosp Psychiatry* **37**, 522-7.
- Blomstedt GC, Katila H, Henriksson M, Ekholm A, Jaaskelainen JE, Pyykko I** (1996). Depression after surgery for acoustic neuroma. *Journal of Neurology, Neurosurgery & Psychiatry* **61**, 403-406.
- Blumel MB, Gibbons FA, Kanacri CA, Kerrigan BN, Florenzano UR** (2005). Depressive symptoms after an acute myocardial infarction. *Revista Medica de Chile* **133**, 1021-1027.
- Castro-de-Araujo LF, Barcelos-Ferreira R, Martins CB, Bottino CM** (2013). Depressive morbidity among elderly individuals who are hospitalized, reside at long-term care facilities, and are under outpatient care in Brazil: a meta-analysis. *Revista Brasileira de Psiquiatria* **35**, 201-7.
- Cepoiu M, McCusker J, Cole MG, Sewitch M, Belzile E, Ciampi A** (2008). Recognition of depression by non-psychiatric physicians--a systematic literature review and meta-analysis. *Journal of General Internal Medicine* **23**, 25-36.

Craig A, Tran Y, Middleton J (2009). Psychological morbidity and spinal cord injury: a systematic review. *Spinal Cord* **47**, 108-14.

Davydow DS, Gifford JM, Desai SV, Bienvenu OJ, Needham DM (2009). Depression in general intensive care unit survivors: a systematic review. *Intensive Care Medicine* **35**, 796-809.

Delville CL, McDougall G (2008). A systematic review of depression in adults with heart failure: instruments and incidence. *Issues In Mental Health Nursing* **29**, 1002-17.

DiMatteo MR, Lepper HS, Croghan TW (2000). Depression is a risk factor for noncompliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. *Archives of Internal Medicine* **160**, 2101-2107.

Dogar IA, Khawaja IS, Azeem MW, Awan H, Ayub A, Iqbal J, Thuras P (2008). Prevalence and risk factors for depression and anxiety in hospitalized cardiac patients in Pakistan. *Psychiatry* **5**, 38-41.

Dyster-Aas J, Willebrand M, Wikehult B, Gerdin B, Ekselius L (2008). Major depression and posttraumatic stress disorder symptoms following severe burn injury in relation to lifetime psychiatric morbidity. *Journal of Trauma - Injury, Infection and Critical Care* **64**, 1349-1356.

Egede LE (2007). Major depression in individuals with chronic medical disorders: prevalence, correlates and association with health resource utilization, lost productivity and functional disability. *General Hospital Psychiatry* **29**, 409-416.

Feldman E, Mayou R, Hawton K (1987). Psychiatric disorder in medical in-patients. *Quarterly Journal of Medicine* **63**, 405-412.

Fenton FR, Cole MG, Engelsmann F, Mansouri I (1994). Depression in older medical inpatients. *International Journal of Geriatric Psychiatry* **9**, 279-284.

First MB, Gibbon M, Spitzer RL, Williams JBW (1996). *User's guide for the SCID-I, structured clinical interview for DSM-IV axis I disorders, research version*. Biometrics Research Department, New York State Psychiatric Institute, New York.

Fritzsche K, Struss Y, Stein B, Spahn C (2003). Psychosomatic liaison service in hematological oncology: need for psychotherapeutic interventions and their realization. *Hematological Oncology* **21**, 83-89.

Guddat C, Grouven U, Bender R, Skipka G (2012). A note on the graphical presentation of prediction intervals in random-effects meta-analyses. *Systematic Reviews* **1**, 34.

Hardman A, Maguire P, Crowther D (1989). The recognition of psychiatric morbidity on a medical oncology ward. *Journal of Psychosomatic Research* **33**, 235-239.

Heeren TJ, Rooymans HG (1985). [Psychiatric disorders in elderly hospitalized patients: prevalence and recognition]. *Tijdschrift voor Gerontologie en Geriatrie* **16**, 53-59.

Higgins JP, Thompson SG, Deeks JJ, Altman DG (2003). Measuring inconsistency in meta-analyses. *British Medical Journal* **327**, 557-60.

Hirschfeld RM, Keller MB, Panico S, Arons BS, Barlow D, Davidoff F, Endicott J, Froom J, Goldstein M, Gorman JM, Marek RG, Maurer TA, Meyer R, Phillips K, Ross J, Schwenk TL, Sharfstein SS, Thase ME, Wyatt RJ (1997). The National Depressive and Manic-Depressive Association consensus statement on the undertreatment of depression. *Journal of the American Medical Association* **277**, 333-340.

Hosaka T, Aoki T, Watanabe T, Okuyama T, Kurosawa H (1999). Comorbidity of depression among physically ill patients and its effect on the length of hospital stay. *Psychiatry & Clinical Neurosciences* **53**, 491-495.

Jenkins P, Jamil N, Taylor B, Hughes L (1994). Why don't surgeons refer to psychiatrists? Psychological morbidity in acute surgical admissions. *New Trends in Experimental & Clinical Psychiatry* **10**, 93-95.

Juni P, Witschi A, Bloch R, Egger M (1999). The hazards of scoring the quality of clinical trials for meta-analysis. *Journal of the American Medical Association* **282**, 1054-60.

Kathol RG, Wenzel RP (1992). Natural history of symptoms of depression and anxiety during inpatient treatment on general medicine wards. *Journal of General Internal Medicine* **7**, 287-293.

Katon W (1996). The impact of major depression on chronic medical illness. *General Hospital Psychiatry* **18**, 215-219.

Katon W, Sullivan MD (1990). Depression and chronic medical illness. *Journal of Clinical Psychiatry* **51 Suppl**, 3-11.

Kayhan F, Cicek E, Uguz F, Karababa IF, Kucur R (2013). Mood and anxiety disorders among inpatients of a university hospital in Turkey. *General Hospital Psychiatry* **35**, 417-422.

Kessler D, Lloyd K, Lewis G, Gray DP (1999). Cross sectional study of symptom attribution and recognition of depression and anxiety in primary care. *British Medical Journal* **318**, 436-9.

Kessler RC, Bromet EJ (2013). The epidemiology of depression across cultures. *Annual Review of Public Health* **34**, 119-38.

Kigamwa A (1991). Psychiatric morbidity and referral rate among medical in-patients at Kenyatta National Hospital. *East African Medical Journal* **68**, 383-388.

Kishi Y, Robinson RG, Forrester AW (1994). Prospective longitudinal study of depression following spinal cord injury. *Journal of Neuropsychiatry and Clinical Neurosciences* **6**, 237-237.

Koenig HG, George LK, Peterson BL, Pieper CF (1997). Depression in medically ill hospitalized older adults: prevalence, characteristics, and course of symptoms according to six diagnostic schemes. *American Journal of Psychiatry* **154**, 1376-1383.

Koenig HG, Meador KG, Shelp F, Goli V, Cohen HJ, Blazer DG. (1991). Major depressive disorder in hospitalized medically ill patients: an examination of young and elderly male veterans. *Journal of the American Geriatrics Society* **39**, 881-890.

Koenig HG, O'Connor CM, Guarisco SA, Zabel K, Ford SM (1993). Depressive disorder in older medical inpatients on general medicine and cardiology services at a university teaching hospital. *The American Journal of Geriatric Psychiatry* **1**, 197-210.

Kok RM, Heeren TJ, Drenth EC, Janzing JG, de Wildt AG (1992). [Psychiatric disorders in elderly patients admitted in a general hospital]. *Nederlands Tijdschrift voor Geneeskunde* **136**, 1913-1917.

Kok RM, Heeren TJ, Hooijer C, Dinkgreve MA, Rooijmans HG (1995). The prevalence of depression in elderly medical inpatients. *Journal of Affective Disorders* **33**, 77-82.

Koroglu G, Tural U (2010). The prevalence of comorbid psychiatric disorders among inpatients with medical illness and their effects on quality of life and functioning. *Yeni Symposium: psikiyatri, noroloji ve davranis bilimleri dergisi* **48**, 54-62.

Kouwenhoven SE, Kirkevold M, Engedal K, Kim HS. (2011). Depression in acute stroke: prevalence, dominant symptoms and associated factors. A systematic literature review. *Disability and Rehabilitation* **33**, 539-56.

Kugaya A, Akechi T, Okuyama T, Nakano T, Mikami I, Okamura H, Uchitomi Y (2000). Prevalence, predictive factors, and screening for psychologic distress in patients with newly diagnosed head and neck cancer. *Cancer* **88**, 2817-23.

- Kumar KL, Kar S, Reddy CMPK, Babu RS** (2011). Psychiatric co-morbidity in geriatric in patients. *Indian Journal of Psychiatry* **1**, S41.
- Lazaro L, de Pablo J, Nieto E, Vieta E, Vilalta J, Cirera E** (1991). Psychiatric morbidity in elderly patients admitted to a general hospital. A day-prevalence study. *Medicina Clinica* **97**, 206-210.
- Lazaro L, Marcos T, Valdes M** (1995). Affective disorders, social support, and health status in geriatric patients in a general hospital. *General Hospital Psychiatry* **17**, 299-304.
- Linka E, Bartko G, Agardi T, Kemeny K** (1999). Dementia and depression in elderly population of a medical department. *Psychiatria Hungarica* **14**, 39-45.
- Linka E, Bartko G, Agardi T, Kemeny K** (2000). Dementia and depression in elderly medical inpatients. *International Psychogeriatrics* **12**, 67-75.
- Loney PL, Chambers LW, Bennett KJ, Roberts JG, Stratford PW** (1998). Critical appraisal of the health research literature: prevalence or incidence of a health problem. *Chronic Diseases in Canada* **19**, 170-176.
- Lykouras L, Adrachta D, Kalfakis N, Oulis P, Voulgari A, Christodoulou G, Papageorgiou C, Stefanis C** (1996). GHQ-28 as an aid to detect mental disorders in neurological inpatients. *Acta Psychiatrica Scandinavica* **93**, 212-216.
- Madianos MG, Papaghelis M, Ioannovich J, Dafni R** (2001). Psychiatric disorders in burn patients: a follow-up study. *Psychotherapy and psychosomatics* **70**, 30-37.
- Marchesi C, Brusamonti E, Borghi C, Giannini A, Di Ruvo R, Minneo F, Quarantelli C, Maggini C** (2004). Anxiety and depressive disorders in an emergency department ward of a general hospital: a control study. *Emergency Medicine Journal* **21**, 175-179.
- Mayou R, Hawton K, Feldman, E** (1988). What happens to medical patients with psychiatric disorder? *Journal of Psychosomatic Research* **32**, 541-9.
- Mitchell AJ, Chan M, Bhatti H, Halton M, Grassi L, Johansen C, Meader N** (2011). Prevalence of depression, anxiety, and adjustment disorder in oncological, haematological, and palliative-care settings: a meta-analysis of 94 interview-based studies. *Lancet Oncology* **12**, 160-74.
- Moayedoddin B, Rubovszky G, Mammana L, Jeannot E, Sartori M, Garin N, Andreoli A, Canuto A, Perrier A** (2013). Prevalence and clinical characteristics of the DSM IV major depression among general internal medicine patients. *European Journal of Internal Medicine* **24**, 763-766.
- Moher D, Liberati A, Tetzlaff J, Altman DG, Group P** (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *British Medical Journal* **339**, b2535.
- Nair MG, Pillay SS** (1997). Psychiatric disorder in a South African general hospital. Prevalence in medical, surgical, and gynecological wards. *General Hospital Psychiatry* **19**, 144-148.
- Newcombe RG** (1998). Two-sided confidence intervals for the single proportion: comparison of seven methods. *Statistics in Medicine* **17**, 857-72.
- Ng K, Chan K, Straughan P** (1995). A study of post-stroke depression in a rehabilitative center. *Acta Psychiatrica Scandinavica* **92**, 75-79.
- O'Riordan TG, Hayes JP, Shelley R, O'Neill D, Walsh J, Coakley D** (1989). The prevalence of depression in an acute geriatric medical assessment unit. *International Journal of Geriatric Psychiatry* **4**, 17-21.
- Pakriev S, Kovalev J, Mozhaev M** (2009). Prevalence of depression in a general hospital in Izhevsk, Russia. *Nordic Journal of Psychiatry* **63**, 469-474.

Palmu R, Suominen K, Vuola J, Isometsa E (2010). Mental disorders among acute burn patients. *Burns* **36**, 1072-1079.

Palmu R, Suominen K, Vuola J, Isometsa E (2011). Mental disorders after burn injury: a prospective study. *Burns* **37**, 601-609.

Petrak F, Hardt J, Wittchen HU, Kulzer B, Hirsch A, Hentzelt F, Borck K, Jacobi F, Egle UT, Hoffmann SO (2003). Prevalence of psychiatric disorders in an onset cohort of adults with type 1 diabetes. *Diabetes/Metabolism Research and Reviews* **19**, 216-222.

Poynter B, Shuman M, Diaz-Granados N, Kapral M, Grace SL, Stewart DE (2009). Sex differences in the prevalence of post-stroke depression: a systematic review. *Psychosomatics* **50**, 563-9.

Prieto JM, Blanch J, Atala J, Carreras E, Rovira M, Cirera E, Gasto C (2002). Psychiatric morbidity and impact on hospital length of stay among hematologic cancer patients receiving stem-cell transplantation. *Journal of Clinical Oncology* **20**, 1907-1917.

R Core Team (2015). R: A language and environment for statistical computing.: Vienna, Austria.

Regvat J, Zmitek A, Vegnuti M, Kosnik M, Suskovic S (2011). Anxiety and depression during hospital treatment of exacerbation of chronic obstructive pulmonary disease. *Journal of International Medical Research* **39**, 1028-1038.

Schwarzer G, Carpenter J, Rucker, G (2014). Meta-analysis with R. R package version 3.8-0.

Seltzer, A. (1989). Prevalence, detection and referral of psychiatric morbidity in general medical patients. *Journal of the Royal Society of Medicine* **82**, 410-412.

Shanmugasegaram S, Russell KL, Kovacs AH, Stewart DE, Grace SL (2012). Gender and sex differences in prevalence of major depression in coronary artery disease patients: a meta-analysis. *Maturitas* **73**, 305-11.

Sharma P, Avasthi A, Chakrabarti S, Varma S (2002). Depression among hospitalised medically ill patients: a two-stage screening study. *Journal of Affective Disorders* **70**, 205-209.

Silverstone PH (1996). Prevalence of psychiatric disorders in medical inpatients. *Journal of Nervous & Mental Disease* **184**, 43-51.

Singer S, Szalai C, Briest S, Brown A, Dietz A, Einkenkel J, Jonas S, Konnopka A, Papsdorf K, Langanke D, Lobner M, Schiefke F, Stolzenburg J, Weimann A, Wirtz H, Konig H, Riedel-Heller S (2013). Co-morbid mental health conditions in cancer patients at working age- Prevalence, risk profiles, and care uptake. *Psycho-Oncology* **22**, 2291-2297.

Snyder S, Reyner A, Schmeidler J, Bogursky E, Gomez H, Strain JJ (1992). Prevalence of mental disorders in newly admitted medical inpatients with AIDS. *Psychosomatics* **33**, 166-170.

Soeiro RE, Colombo ES, Ferreira MHF, Guimaraes PSA, Botega NJ, Dalgalarrrondo P (2008). Religion and psychiatric disorders in patients admitted to a university general hospital. [Portuguese]. *Cadernos de Saude Publica* **24**, 793-799.

Starkstein SE, Robinson RG, Berthier ML, Price TR (1988). Depressive disorders following posterior circulation as compared with middle cerebral artery infarcts. *Brain* **111**, 375-387.

Stroup DF, Berlin JA, Morton SC, Olkin I, Williamson GD, Rennie D, MoherD, Becker BJ, Sipe TA, Thacker SB (2000). Meta-analysis of observational studies in epidemiology: a proposal for reporting. Meta-analysis Of Observational Studies in Epidemiology (MOOSE) group. *Journal of the American Medical Association* **283**, 2008-12.

Terrin N, Schmid CH, Lau J (2005). In an empirical evaluation of the funnel plot, researchers could not visually identify publication bias. *Journal of Clinical Epidemiology* **58**, 894-901.

Thalassinos M, Masson C, Rouillon F, Vinceneux P, Lemperiere T (1992). [Mental disorders in elderly hospitalized patients. Epidemiological study in an internal medicine department]. *Presse Medicale* **21**, 929-933.

The World Bank (2015). Country and Lending Groups.

Thombs BD, Bass EB, Ford DE, Stewart KJ, Tsilidis KK, Patel U, Fauerbach JA, Bush DE, Ziegelstein RC (2006a). Prevalence of depression in survivors of acute myocardial infarction. *Journal of General Internal Medicine* **21**, 30-8.

Thombs BD, Bresnick MG, Magyar-Russell G (2006b). Depression in survivors of burn injury: a systematic review. *General Hospital Psychiatry* **28**, 494-502.

Thompson SG, Higgins JP (2002). How should meta-regression analyses be undertaken and interpreted? *Statistics in Medicine* **21**, 1559-73.

Topitz A, Benda N, Saumer G, Friedrich F, Konig D, Soulier N, Freidl M (2015). Prevalence and recognition of depression among inpatients of non-psychiatric hospital departments. *Neuropsychiatry* **29**, 63-70.

Turner K, Piazzini A, Chiesa V, Barbieri V, Vignoli A, Gardella E, Tisi G, Scarone S, Canevini MP, Gambini O (2011). Patients with epilepsy and patients with psychogenic non-epileptic seizures: video-EEG, clinical and neuropsychological evaluation. *Seizure* **20**, 706-710.

Uwakwe R (2000). Psychiatric morbidity in elderly patients admitted to non-psychiatric wards in a general/teaching hospital in Nigeria. *International Journal of Geriatric Psychiatry* **15**, 346-354.

Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, Shibuya K, Salomon JA, Abdalla S, Aboyans V, Abraham J, Ackerman I, Aggarwal R, Ahn SY, Ali MK, Alvarado M, Anderson HR, Anderson LM, Andrews KG, Atkinson C, Baddour LM, Bahalim AN, Barker-Collo S, Barrero LH, Bartels DH, Basanez MG, Baxter A, Bell ML, Benjamin EJ, Bennett D, Bernabe E, Bhalla K, Bhandari B, Bikbov B, Bin Abdulhak A, Birbeck G, Black JA, Blencowe H, Blore JD, Blyth F, Bolliger I, Bonaventure A, Boufous S, Bourne R, Boussinesq M, Braithwaite T, Brayne C, Bridgett L, Brooker S, Brooks P, Brugha TS, Bryan-Hancock C, Bucello C, Buchbinder R, Buckle G, Budke CM, Burch M, Burney P, Burstein R, Calabria B, Campbell B, Canter CE, Carabin H, Carapetis J, Carmona L, Cella C, Charlson F, Chen H, Cheng AT, Chou D, Chugh SS, Coffeng LE, Colan SD, Colquhoun S, Colson KE, Condon J, Connor MD, Cooper LT, Corriere M, Cortinovis M, de Vaccaro KC, Couser W, Cowie BC, Criqui MH, Cross M, Dabhadka, KC, Dahiya M, Dahodwala N, Damsere-Derry J, Danaei G, Davis A, De Leo D, Degenhardt L, Dellavalle R, Delossantos A, Denenberg J, Derrett S, Des Jarlais DC, Dharmaratne SD, Dherani M, Diaz-Torne C, Dolk H, Dorsey ER, Driscoll T, Duber H, Ebel B, Edmond K, Elbaz A, Ali SE, Erskine H, Erwin PJ, Espindola P, Ewoigbokhan SE, Farzadfar F, Feigin V, Felson DT, Ferrari A, Ferri CP, Fevre EM, Finucane MM, Flaxman S, Flood L, Foreman K, Forouzanfar MH, Fowkes FG, Franklin R, Fransen M, Freeman MK, Gabbe BJ, Gabriel SE, Gakidou E, Ganatra HA, Garcia B, Gaspari F, Gillum RF, Gmel G, Gosselin R, Grainger R, Groeger J, Guillemin F, Gunnell D, Gupta R, Haagsma J, Hagan H, Halasa YA, Hall W, Haring D, Haro JM, Harrison JE, Havmoeller R, Hay RJ, Higashi H, Hill C, Hoen B, Hoffman H, Hotez PJ, Hoy D, Huang JJ, Ibeanusi SE, Jacobsen KH, James SL, Jarvis D, Jirasaria R, Jayaraman S, Johns N, Jonas JB, Karthikeyan G, Kassebaum N, Kawakami N, Keren A, Khoo JP, King CH, Knowlton LM, Kobusingye O, Koranteng A, Krishnamurthi R, Lalloo R, Laslett LL, Lathlean T, Leasher JL, Lee YY, Leigh J, Lim SS, Limb E, Lin JK, Lipnick M., Lipshultz SE, Liu W, Loane M, Ohno SL, Lyons R, Ma J, Mabweijano J, MacIntyre MF, Malekzadeh R, Mallinger L, Manivannan S, Marcenes W, March L, Margolis DJ, Marks GB, Marks R, Matsumori A, Matzopoulos R, Mayosi BM, McAnulty JH, McDermott MM, McGill

N, McGrath J, Medina-Mora, ME, Meltzer M, Mensah GA, Merriman TR, Meyer AC, Miglioli V, Miller M, Miller TR, Mitchell PB, Mocumbi AO, Moffitt TE, Mokdad AA, Monasta L, Montico M, Moradi-Lakeh M, Moran A, Morawska L, Mori R, Murdoch ME, Mwaniki MK, Naidoo K, Nair MN, Naldi L, Narayan KM, Nelson PK, Nelson RG, Nevitt MC, Newton CR, Nolte S, Norman P, Norman R, O'Donnell M, O'Hanlon S, Olives C, Omer SB, Ortblad K, Osborne R, Ozgediz D, Page A, Pahari B, Pandian JD, Rivero AP, Patten SB, Pearce N, Padilla RP, Perez-Ruiz F, Perico N, Pesudovs K, Phillips D, Phillips MR, Pierce K, Pion S, Polanczyk GV, Polinder S, Pope C A 3rd, Popova S, Porrini E, Pourmalek F, Prince M, Pullan RL, Ramaiah KD, Ranganathan D, Razavi H, Regan M, Rehm JT, Rein DB, Remuzzi G, Richardson K, Rivara FP, Roberts T, Robinson C, De Leon FR, Ronfani L, Room R, Rosenfeld LC, Rushton L, Sacco RL, Saha S, Sampson U, Sanchez-Riera L, Sanman E, Schwebel DC, Scott JG, Segui-Gomez M, Shahraz S, Shepard DS, Shin H, Shivakoti R, Singh D, Singh GM, Singh JA, Singleton J, Sleet DA, Sliwa K, Smith E, Smith JL, Stapelberg NJ, Steer A, Steiner T, Stolk WA, Stovner LJ, Sudfeld C, Syed S, Tamburlini G, Tavakkoli M, Taylor HR, Taylor JA, Taylor WJ, Thomas B, Thomson WM, Thurston GD, Tleyjeh IM, Tonelli M, Towbin JA, Truelsen T, Tsilimbaris MK, Ubeda C, Undurraga EA, van der Werf MJ, van Os J, Vavilala M S, Venketasubramanian N, Wang M, Wang W, Watt K, Weatherall DJ, Weinstock MA, Weintraub R, Weisskopf MG, Weissman MM, White RA, Whiteford H, Wiersma ST, Wilkinson JD, Williams HC, Williams SR, Witt E, Wolfe F, Woolf AD, Wulf S, Yeh PH, Zaidi A K, Zheng ZJ, Zonies D, Lopez AD, Murray CJ, AlMazroa MA, Memish ZA (2012). Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* **380**, 2163-96.

Walker J, Hansen CH, Martin P, Symeonides S, Ramessur R, Murray G, Sharpe M (2014). Prevalence, associations, and adequacy of treatment of major depression in patients with cancer: a cross-sectional analysis of routinely collected clinical data. *Lancet Psychiatry* **1**, 343-50.

Walker J, Holm Hansen C, Martin P, Sawhney A, Thekkumpurath P, Beale C, Symeonides S, Wall L, Murray G, Sharpe M (2013). Prevalence of depression in adults with cancer: a systematic review. *Annals of Oncology* **24**, 895-900.

Walker J, Sharpe M (2014). Integrated management of major depression for people with cancer. *International Review of Psychiatry* **26**, 657-68.

Wancata J, Meise U, Sachs G (2000). Prevalence of psychiatric disorders in elderly inpatients of medical and surgical departments. *Psychiatrische Praxis* **27**, 170-5.

Wilder Schaaf KP, Artman LK, Peberdy MA, Walker WC, Ornato JP, Gossip MR, Kreutzer J S, Virginia Commonwealth University A. I. (2013). Anxiety, depression, and PTSD following cardiac arrest: a systematic review of the literature. *Resuscitation* **84**, 873-7.

Wiseman T, Foster K, Curtis K (2013). Mental health following traumatic physical injury: an integrative literature review. *Injury* **44**, 1383-90.

World Health Organization (1992). *International Classification of Mental and Behavioural Disorders (ICD-10)*.

Yan ZY, Gu MJ, Zhong BL, Wang C, Tang HL, Ling YQ, Yu XW, Li MQ (2013). Prevalence, risk factors and recognition rates of depressive disorders among inpatients of tertiary general hospitals in Shanghai, China. *Journal of Psychosomatic Research* **75**, 65-71.

Yellowlees PM, Alpers J, Bowden J, Bryant G, Ruffin R (1987). Psychiatric morbidity in patients with chronic airflow obstruction. *Medical Journal of Australia* **146**, 305-307.

Zhao L, Li X, Zhang Z, Song C, Guo C, Zhang Y, Li L, Lu G, Zheng G, Wang K, Pei W, Han L (2014). Prevalence, correlates and recognition of depression in Chinese inpatients with cancer. *General Hospital Psychiatry* **36**, 477-482.

Zhong BI, Chen H, Zhang J, Xu H, Zhou C, Yang F, Song J, Tang J, Xu Y, Zhang S, Zhang Y, Zhou L (2010). Prevalence, correlates and recognition of depression among inpatients of general hospitals in Wuhan, China. *General Hospital Psychiatry* **32**, 268-275.