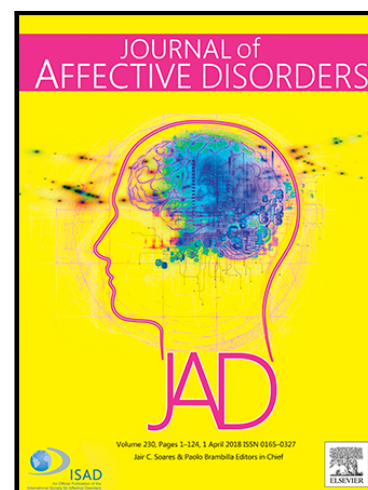


## Accepted Manuscript

Social networks of patients with chronic depression: a systematic review

Chiara Visentini , Megan Cassidy , Victoria Jane Bird ,  
Stefan Priebe

PII: S0165-0327(18)31192-3  
DOI: <https://doi.org/10.1016/j.jad.2018.08.022>  
Reference: JAD 10019



To appear in: *Journal of Affective Disorders*

Received date: 4 June 2018  
Revised date: 31 July 2018  
Accepted date: 7 August 2018

Please cite this article as: Chiara Visentini , Megan Cassidy , Victoria Jane Bird , Stefan Priebe , Social networks of patients with chronic depression: a systematic review, *Journal of Affective Disorders* (2018), doi: <https://doi.org/10.1016/j.jad.2018.08.022>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## Highlights

- This is the first systematic review on social networks of patients with chronic depression.
- Social networks of chronically depressed patients are smaller than those of healthy individuals and of patients with other mental disorders, with the exception of patients with schizophrenia.
- Few articles included in the review have used objective measures to assess patients' social networks.
- The overall evidence is limited as existing studies used very inconsistent methodologies.

ACCEPTED MANUSCRIPT

## **Social networks of patients with chronic depression: a systematic review**

Chiara Visentini<sup>2</sup>, Megan Cassidy<sup>1\*</sup>, Victoria Jane Bird<sup>1</sup>, Stefan Priebe<sup>1</sup>

<sup>1</sup> Unit for Social and Community Psychiatry, WHO Collaborating Centre for Mental Health Services Development, Queen Mary University of London, UK

<sup>2</sup> School of Specialisation in Psychiatry, University of Modena and Reggio Emilia, Italy

**Declaration of interest:** none

**\*Corresponding author:**

Megan Cassidy

Address: Unit for Social and Community Psychiatry, WHO Collaborating Centre for Mental Health Services Development, Newham Centre for Mental Health, Glen Road, London E13 8SP

Email: m.cassidy@qmul.ac.uk

Phone: +44 (0)20 7540 4380 ext.2340

## Abstract

**Introduction and Aim:** The social networks of patients are an important factor for the prognosis of mental disorders and can be potentially targeted through psycho-social interventions. We aimed to explore these networks in patients with chronic depression, by conducting a systematic review on the characteristics of social networks in this patient group.

**Methods:** Six databases, three key journals and grey literature were searched. Two reviewers screened the articles, assessed the risk of bias and extracted the information needed. Findings were descriptively synthesised.

**Results:** Nineteen articles met the inclusion criteria reporting the findings of a total of 873 patients with chronic depression. Four papers presented results without a comparison group (six in comparison to a healthy population, eight to patients with non-chronic major depression and three to patients with other mental disorders). Social networks of patients with chronic depression appeared to be smaller than those of healthy individuals, patients with non-chronic major depression and other disorders.

**Limitations:** Studies used different concepts of chronic depression and inconsistent methodologies for assessing social networks. Only three studies adopted objective measures.

**Conclusions:** Whilst the evidence on social networks of patients with chronic depression is limited, the networks appear smaller than in most comparison groups, including patients with non-chronic depression.

**Key words:** Depression, Chronic Depression, Dysthymia, Social contacts, Social Networks

## Introduction

The term ‘social network’ refers to the social ties that link individuals together through communication (Cohen et al., 1978) and different sets of interactions. Although this term is not precise, it can be characterised more clearly by both the structure of the network (i.e. size, the frequency of contact etc.) and the network function (i.e. social support, the content of the relationships) (Santini et al., 2015).

The literature suggests that a patient’s social network and relationships are important factors for both mental and physical health outcomes (Leigh-Hunt et al., 2017). Evidence shows that poor social networks and social isolation are linked with a variety of unfavourable outcomes including an increased risk of cardiovascular disease (Bunker et al., 2003, Cuffee et al, 2014,

increased mortality (Holt-Lunstad et al., 2010, Holt-Lunstad et al., 2015), poorer general health (Chen et al., 2014), and increased risk of depression (Santini et al., 2015) and suicide (Hatcher et al, 2013). As such, satisfactory social support and robust social networks have an important role in maintaining a person's quality of life and good mental health (Hansson, 2006; Li et al., 2014).

Depression is one of the most common and prominent mental disorders worldwide. It is a leading cause of disability and can cause high levels of distress and increased risk of suicide (World Health Organisation, 2017). Although there are a range of treatment options available for acute depression, between 20-30% of patients go on to develop chronic depression, defined as symptoms continuing for two years or more (Angst et al, 2009). These patients often continue to have a poor quality of life, are more likely to have a physical comorbidity and functional impairment and often cause distress for their families, partners and friends. Chronic depression is linked with worse social, economic and interpersonal conditions than episodic depression; individuals with chronic depression are more often single, unemployed and living on social benefits and have fewer children (Angst et al, 2009). Patients often receive long-term care in secondary mental health services, and chronic depression is one of the most common disorders encountered in clinical outpatient settings, with 22-36% of patients meeting the diagnostic criteria for dysthymia (Klein and Santiago, 2003).

The association between social relationships and affective disorders has also been investigated in the literature (Santini et al., 2015) with the identification of some protective factors against depression, notably perceived emotional support and large, diverse social networks. However, there is little evidence on the exact characteristics of the social networks of patients with chronic depression.

### **Aim**

Given the evidence on the importance of social networks for an individual's physical and mental wellbeing, as well as the poor prognosis for individuals with chronic depression, the aim of the following systematic review is to investigate the characteristics of the social networks of patients with chronic depression.

## **Methods**

### **Search strategy**

A systematic review of the literature was carried out, according to the PRISMA guidelines (Moher et al., 2009). An electronic search through six databases, Embase, MEDLINE, PsycINFO, CINAHL, DARE, CENTRAL, was performed, from inception, in July 2017 and updated in April 2018. The search terms employed as keywords were: (Social network\* OR Social contact OR Social isolation OR Socially Isolated OR Lonel\* OR Social environment OR Social Support OR Social Withdrawal OR Social relationships OR Social Relations OR Social Capital) AND (Chronic Depression OR Treatment Resistant Depression OR Treatment-Resistant Depress\* OR Therapy Resistant Depression OR Long-term Depression OR Dysthymia OR Persistent Depress\* OR Depressive Disorder). In addition, backward snowballing related to citations in papers was conducted; hand searches along the indexes, from the year 1970 to 2018, were carried out in the following key journals: British Journal of Psychiatry, Journal of Affective Disorders and British Medical Journal. Grey literature was also searched: OpenGrey, BASE and Google Scholar. The review was registered on PROSPERO (CRD42017080235).

## **Eligibility criteria**

### *Inclusion Criteria*

Studies were eligible if at least 50% of the patient sample was diagnosed as chronically depressed by a clinician or researcher and if the publications reported any assessment of social networks.

We included different diagnostic terms – chronic depression, dysthymia, double depression, and neurotic depression – as long as the duration of the clinically relevant depressed mood was clearly defined as lasting, continuously, for two years or longer.

Reflecting the inconsistent definitions of social networks and the different terminologies used, we adopted an inclusive approach and included any assessment of social networks, contacts, relationships and support, as all of them represent a type of interaction or bond between individuals.

Papers were considered without limitations regarding the language, country of origin and study design. Studies in primary, secondary, tertiary care, and community settings were included.

### *Exclusion Criteria*

Articles were excluded if the majority of participants were under the age of 18 or over the age of 70 years; the psychiatric diagnosis was self-reported; a physical comorbidity was present; the depression was related to a pre- or post-partum condition.

We did not include studies addressing social functioning as this is a clearly distinct concept.

### **Review strategy**

Titles and abstracts of the identified papers were exported in to EndNote and were independently screened by two reviewers (MC, CV) to determine potentially relevant articles. Results from both reviewers were compared and a high inter-observer agreement was found (97.5%). Full-text articles were then screened for inclusion by both reviewers. In case of disagreement, a third reviewer (VJB, SP) was involved in making the final decision about inclusion.

### **Data extraction, quality assessment, data synthesis**

Two reviewers (MC, CV) independently extracted the data on the study setting, patients' demographics, methodology, type of recruitment and outcomes, using a pre-piloted form designed ad hoc for the purpose of this review. Risk of bias was assessed using the Effective Public Health Practice Project (EPHPP) (1998) quality assessment tool for quantitative studies and the Critical Appraisal Skills Programme (CASP) (2017) for qualitative ones. The ratings of the EPHPP related to the: selection bias, study design, confounders, blinding, data collection method, withdrawals and dropouts; the ratings of the CASP related to the: aim, methodology, design, recruitment, data collection, relationship between researcher and participant, ethical issue, analysis, findings, value of the research. Findings were narratively described and summarised. A meta-analysis could not be conducted because of the variability of the measures used in the studies.

### **Results**

The initial searches yielded 8131 articles, 8082 through database searching and 49 through other sources, as previously described. During full-text screening, 180 studies were reviewed for inclusion, and 19 were included in the review. One paper did not have enough

information to be extracted, despite contact with the author. The detailed selection process is presented in the PRISMA flow diagram (Fig. 1).

### Overview of the included studies

The studies were published between 1986 and 2015. They were conducted across nine countries: Brazil (Orsini and Ribeiro, 2012), Finland (Honkalampi et al., 2005), Hungary (Szadoczky et al., 2004), India (Ajinkya et al., 2015; Gupta et al., 2014; Kulhara and Chopra, 1996; Subodh et al., 2008), The Netherlands (Cornelis et al., 1989; Spijker et al., 2004), Norway (Cramer et al., 2010), Sweden (Magne-Ingvar et al., 1992), the United Kingdom (Baines, 2000) and United States of America (George et al., 1989; Hays et al., 1997; Hirschfeld et al., 1986; Klein et al., 1988a; Klein et al., 1988b; McCullough et al., 1994a; McCullough et al., 1994b).

The studies were conducted in a number of different settings:

1. *Community setting*, comprising primary and secondary care (Baines, 2000; Cornelis et al., 1989; Cramer et al., 2010; Hays et al., 1997; Hirschfeld et al., 1986; Honkalampi et al., 2005; Klein et al., 1988a; Klein et al., 1988b; Kulhara and Chopra, 1996; McCullough et al., 1994a; McCullough et al., 1994b; Spijker et al., 2004; Subodh et al., 2008);
2. *Inpatient setting* (George et al., 1989; Hirschfeld et al., 1986; Szadoczky et al., 2004);
3. *Highly specialised setting, including tertiary care* (Ajinkya et al., 2015; Gupta et al., 2014; Magne-Ingvar et al., 1992).

In one study it was not possible to identify the setting (Orsini and Ribeiro, 2012).

With regard to the study design; six were case-control studies, five were cross-sectional, five were cohort studies, one was a longitudinal study, one was a case study and one was a qualitative study using semi-structured interviews.

### Risk of bias assessment

On the EPHPP quality assessment tool for quantitative studies six studies were rated as weak, six as moderate and six as strong. The qualitative study (Orsini and Ribeiro, 2012) was rated on the CASP as appropriate only with regard to aims, methodology, research design and data analysis. The risk of bias assessment is presented in Table 1.



**Patients' sample: demographic characteristics**

In total, 873 patients with chronic depression were included in the articles. Table 2 shows their socio-demographic characteristics. The majority of patients were female, under 50 years of age, with a high level of education.

**Patients' sample: mental illness characteristics**

The diagnostic classification systems used in the studies were DSM-III (Diagnostic and Statistical Manual of Mental Disorders), DSM-III-R, DSM-IV, DSM-IV-R, DSM-5 and ICD-10 (International Classification of Diseases), in one case more than one system was adopted. In three studies, the diagnostic system was not stated (Hirschfeld et al., 1986; Honkalampi et al., 2005; Orsini and Ribeiro, 2012). In fifteen cases validated symptoms scales were used to underpin the diagnosis. Two papers (Ajinkya et al., 2015; Orsini and Ribeiro, 2012) did not report how the diagnosis was established.

In three of the 19 studies data were extracted from a sample that was not comprised entirely by individuals with chronic depression. (Cornelis et al., 1989; George et al., 1989; Gupta et al., 2014). In these studies 50% or less of the sample, 42%, 29%, 50% respectively, were diagnosed with major depression.

**Social network and Social Support**

During synthesis, the studies were grouped in three ways: results without any comparison group; results compared with those of a healthy sample; and results compared with those of patients with other mental disorders.

*Reports of social networks without comparison groups*

There was only one study (Baines, 2000) that reported the size and structure of the social network of patients. They found these networks included between three and five people and consisted mostly of parents, partners and, in two of the patients, non-familial friends.

Two studies measured the perceived social support of patients. McCullough et al. (1994b) found patients reported medium levels of perceived social support, and these remained stable at one year of follow-up. However, Spijker et al.'s (2004) study found there was no significant difference in whether patients rated their perceived social support as low, medium

or high. In a qualitative study (Orsini and Ribeiro, 2012) patients were described as feeling lonely and said that their symptoms persisted even when social support was available. However, patients did remark that their symptoms and condition did worsen if they had difficult social relationships or they had conflict in their intimate relationships.

#### *Comparisons with healthy populations*

Six studies compared social networks of patients with chronic depression with those in healthy populations. Four of these studies (Honkalampi et al., 2005, McCullough et al., 1994a, Subodh et al., 2008, Cramer et al., 2000) found that patients with chronic depression rated their perceived social support significantly lower than those in the healthy population.

On the other hand, Gupta et al. (2014) found no significant difference in perceived social support between a group of women with dysthymia compared to a group of women who had never had a mood disorder.

Lastly, Cornelis et al. (1989) found the number and proximity of friends *before* the onset of the depression was significantly smaller in the patients than in the healthy group. However, there was no significant difference between either group on subjective measures (i.e. frequency of superficial and deep social contact and personal evaluation of the quality of the social network) of their social networks.

#### *Comparisons with non-chronic major depression*

Eight studies compared social networks in patients with chronic depression with those in patients with a diagnosis of non-chronic major depression. Four studies (Klein et al., 1998a, Klein et al., 1998b, Subodh et al., 2008, Hays et al., 1997) found that patients with chronic depression had significantly lower levels of perceived social support compared to patients with non-chronic depressive disorders. Furthermore, Hays et al. (1997) found that those with a chronic duration of the disease reported significantly lower levels of non-household social interactions. Magne-Ingvar et al. (1992) found patients with dysthymia were more likely to report insufficient social interaction than patients with major depression except on the measure of availability of social integration.

In George et al.'s (1989) study it was found that those who had not recovered from a major depressive episode after 32 months were significantly more likely to have impaired social interactions and perceived social support, but not impaired instrumental support and social

networks. Likewise, Szadoczky et al. (2004) found that those who had remitted within two years had significantly higher perceived social support scores than those who still had major depression after two years. However, Hirschfeld et al. (1986) found that there was no significant difference with regard to reported social support that participants could 'count on', between those who had a diagnosis of chronic depression compared to those who had recovered from depression.

#### *Comparisons with other mental disorders*

Kulhara and Chopra (1996) found that patients with dysthymia rated themselves more often to be lacking in available social support and had significantly lower levels of perceived social support compared to patients with general anxiety disorder or dissociative disorders.

Magne-Ingvar et al. (1992) compared social interaction amongst patients with a variety of Axis I disorders – i.e. dysthymia, substance use disorder, adjustment disorders, anxiety disorders and psychosis. They found that patients with dysthymia were significantly more likely to report insufficient social interaction than those with substance abuse and adjustment disorders. In particular patients with dysthymia were found to be significantly less satisfied than all other groups with their social integration and deep emotional relations. However, Ajinkya et al. (2015) found that patients with a diagnosis of schizophrenia had significantly higher impairment in their social relationships, compared to patients with dysthymia.

## **Discussion**

### **Main Findings**

This review highlights the breadth, structure, and functions of the social networks of patients with chronic depression and it suggests that networks are smaller, and patients' satisfaction with social support is lower, compared to either a healthy population or to patients with other Axis I diagnoses, notably those with episodic major depression. Only in comparison with patients with schizophrenia, in one study, did people with chronic depression score more favourably in their social relationships (Ajinkya et al., 2015).

The evidence deriving from the present systematic review may be regarded as weak overall, mainly due to the inconsistency of measurement tools used to assess the social networks of

patients with chronic depression. Therefore the results of different studies are difficult to compare and to interpret against the findings of other studies.

### **Strengths and limitations**

To our knowledge, this is the first systematic review on social networks in patients with chronic depression and has been developed according to rigorous methodology criteria (Moher et al., 2009). In order to be systematic and to collect all the known evidence on the topic of interest, a comprehensive search was performed, without limitations regarding year of publication, language or country of origin of the articles. Moreover, both quantitative and qualitative studies have been included.

The development across time of the nomenclature, used to categorise the group of patients affected by chronic depressive disorders (American Psychiatric Association, 1980; American Psychiatric Association, 2013; Klerman et al., 1979), could have led to a loss of some papers during the search process. However, the wide-ranging and extensive hand searches on scientific journals and the citation screening procedure conducted should have avoided this critical point.

Another limitation is the sometimes unclear definition and circumscription of patients' social networks across time and the inconsistency of methodological study approaches observed. It was decided from the beginning of the review process, in order to avoid this limit, to be hyper inclusive in order not to be too restrictive, nor overlook what could be part of the social dimension of an individual.

Chronic depressed patients with a physical comorbidity were not included in this review, as such, the findings cannot be generalised to this group of individuals.

Finally, it could be argued that since the patients' living situation was not taken into account, we cannot consider the influence this would have on an individual's social network and level of support.

### **Comparison with the literature and future implications**

In a systematic review looking at the social networks of people with psychotic disorders (Palumbo et al., 2015), the authors found that patients had a mean size of 11.7 individuals in their whole social network. In the present review only one study (Baines, 2000) had this

information and so it is not possible to make a comparison. Santini et al. (2015) found in their systematic review of individuals with non-chronic depression that perceived emotional support, perceived instrumental support and large, diverse social networks appeared to have a protective effect.

Only three papers in our review used objective measurements of the social network. In one study (Cornelis et al., 1989), patients with chronic depression were reported to have impaired social networks at the onset of their disorder. In George et al.'s (1989) study patients with chronic depression were shown to have more impaired social interaction at baseline compared to those with a non-chronic illness. Yet, Hays et al. (1997) reported that patients with a chronic course of depression compared to those with an illness duration between 1 to 12 months, perceived themselves to have significantly less social support and less non-household social interactions. This raises the question of whether low social support and poor social networks are a contributing factor to developing chronic depression or whether individuals who develop the disorder are more likely to withdraw socially or perhaps even to simply perceive that their social support is limited, due to their symptoms and the associated distress. Although there is limited research on this, two studies have looked at these associations in non-chronic depression. First, Pettit et al. (2011) found that higher levels of initial perceived family support in women, in fact predicted a slower decrease in depressive symptoms. However, for men, low levels of support appeared to be the consequence of their depressive symptoms. Almquist et al. (2016) however, found that among women, changes in the levels of social support affected changes in depressive symptoms and vice versa. For men they found that a higher level of social support was associated with a decrease in depressive symptoms over time. It may be useful to consider gender difference when planning a future research project testing the association between social networks and chronic depression.

A recent systematic review on risk factors for a persistent course of depression (Hölzel et al., 2011) has identified some social indexes as frequently associated with chronic depression, but not in a causal relation, these include: low social integration, low social support and negative social interactions. This stimulates discussion about the consequences of the quality of the social interactions that patients develop and not only of the frequency and quantity of them. Furthermore, in another study comparing chronic depressed and episodic depressed patients to healthy subjects (Domes et al., 2016), the chronic group showed higher levels of personal distress in tense social situations and higher impairment in social skills.

Since the evidence for a relationship between non-chronic depression and social networks is currently inconsistent, more research is needed to clarify this relationship, both for chronic and non-chronic depression.

One conclusion from the findings is that it may be helpful to develop interventions to improve the social network of patients with chronic depression. Recommended treatment for chronic depression is based on pharmacotherapy plus psychotherapy with an interpersonal view (Jobst et al., 2016), but more research needs to be done in order to develop valid treatments in the longer term. Another therapeutic option is social interventions to target those with limited social networks. Although there is evidence to suggest this is possible in patients with psychosis (Anderson et al., 2015), there is little evidence on patients with mood disorders. More research is required to see whether an increased social network would indeed lead to better health and social outcomes, in particular for those with a chronic course of depression (Nagy and Moore, 2017).

## **Conclusion**

In conclusion, the present systematic review provides some evidence about the social networks of patients with chronic depression. The networks appear to be smaller than those in the general population and in patient groups with other Axis I diagnostic groups. The only discordant result was in comparison to patients with schizophrenia.

The review underlines the importance and need for future research, using both objective and subjective measures of social networks. A more consistent methodology across studies may help to build up a more useful evidence base, and longitudinal studies are needed to decide whether poor social networks contribute to depression becoming chronic or result from long lasting depression or both. And finally, it should be tested whether poor networks may be the target for specific interventions, psychotherapeutic or social, that could then lead to better outcomes.

## **Acknowledgements**

The authors would like to acknowledge the wider research team at the Unit for Social and Community Psychiatry, Queen Mary University of London, who provided constructive feedback on earlier drafts.

### **Role of Funding Source**

This paper presents independent research funded by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research Programme (Reference Number RP-PG-0615-20010). The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health.

### **Conflict of Interest**

All authors declare they have no conflict of interest.

### **Authors' Statement**

Authors Cassidy and Visentini designed the study and wrote the protocol. Author Visentini managed the literature searches and Authors Cassidy and Visentini conducted the analyses. Authors Cassidy and Visentini wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

### **References**

1. Ajinkya, S.A., Jadhav, P.R., Rajamani, S. (2015). Which is A More Debilitating Disorder Schizophrenia or Dysthymia? - A Comparative Study. *J. Clin. Diagn. Res.* 9 (5), VC01-VC03.
2. Almquist, Y.B., Landstedt, E., & Hammarström, A. (2016). Associations between social support and depressive symptoms: social causation or social selection – or both? *European Journal of Public Health*, 27(1): 84-89.
3. American Psychiatric Association (APA) (1980). *Diagnostic and statistical manual of mental disorders*, 3rd ed., Washington, DC.
4. American Psychiatric Association (APA) (2013). *Diagnostic and statistical manual of mental disorders*, 5th ed., Washington, DC.
5. Anderson, K., Laxhman, N., Priebe, S. (2015). Can mental health interventions change social networks? A systematic review. *B.M.C. Psychiatry*. 15, 297-304.
6. Angst, J., Gamma, A., Rössler, W., Ajdacic, V., Klein, D.N. (2009). Long-term depression versus episodic major depression: Results from the prospective Zurich study of a community sample. *J. Affect. Disord.* 115, 112–121.
7. Baines, L.S. (2000). A study of Social Network Interactions Amongst Women With Dysthymia. <http://www.opengrey.eu/item/display/10068/553790/> (accessed January 2018).
8. Bunker, S.J., Colquhoun, D.M., Esler, M.D., Hickie, I.B., Hunt, D., Jelinek, V.M., Oldenburg, B.F., Peach, H.G., Ruth, D., Tennant, C.C., Tonkin, A.M. (2003). “Stress” and coronary heart disease: psychosocial risk factors. *The Medical Journal of Australia*, 178 (6): 272-6.
9. Chen, Y., & Feeley, T.H. (2014). Social support, social strain, loneliness, and well-being among older adults: An analysis of the Health and Retirement Study. *Journal of Social and Personal Relationships*, 31: 141.
10. Cohen I.C., Sokolovsky J. (1978) Schizophrenia and social networks: ex-patients in the inner city. *Schizophrenia Bulletin*, 4(4):546:560
11. Cornelis, C.M., Ameling, E.H., de Jonghe, F. (1989). Life events and social network in relation to the onset of depression. A controlled study. *Acta Psychiatr. Scand.* 80 (2), 174-179.
12. Cramer, V., Torgersen, S., Kringlen, E. (2010). Mood disorders and quality of life. A community study. *Nord J. Psychiatry*. 64, 58–62.
13. Critical Appraisal Skills Programme (2017). *CASP Qualitative Research Checklist*. <https://casp-uk.net/casp-tools-checklists/> (accessed February 2018)

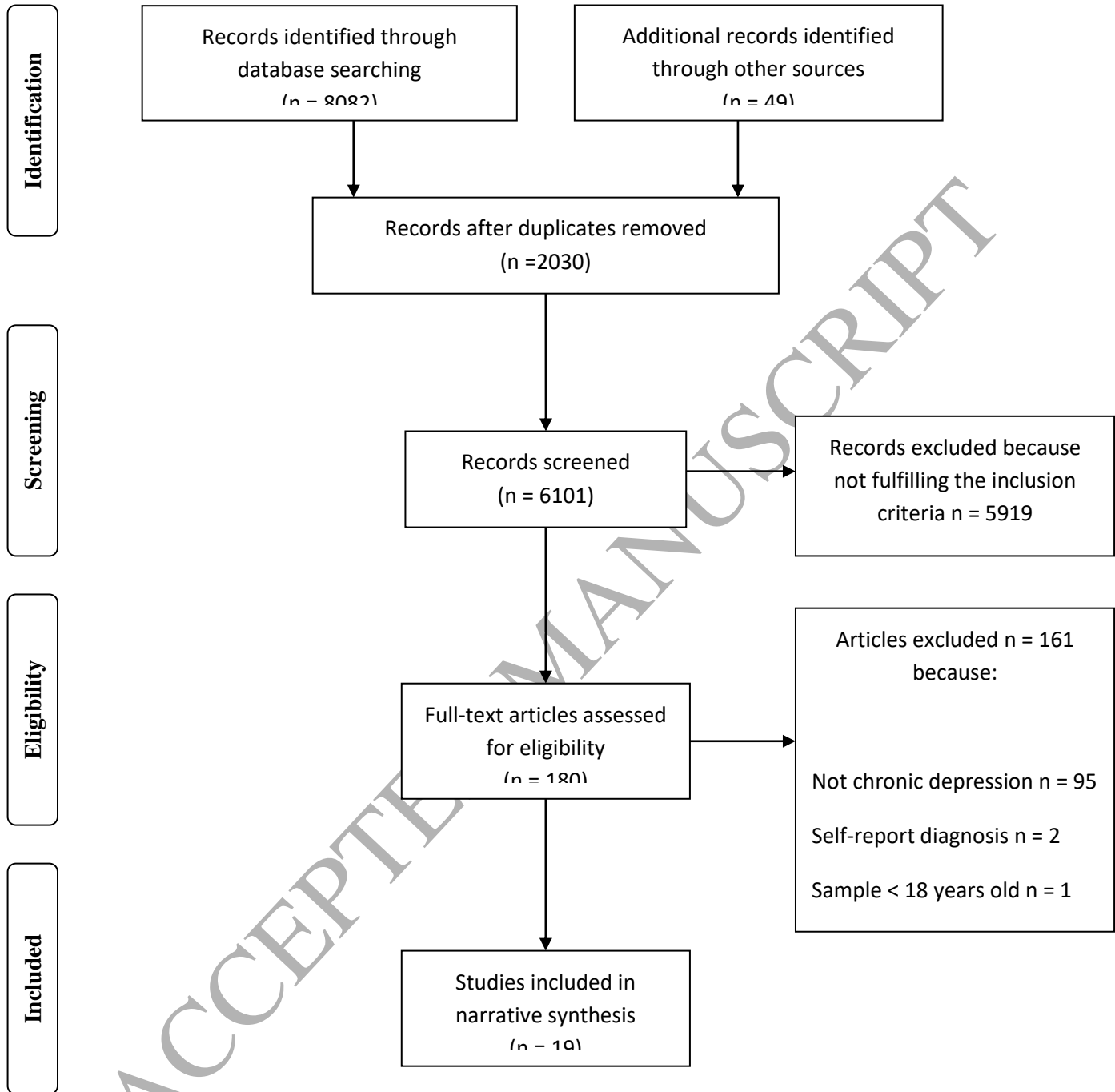


14. Cuffee, Y., Ogedegbe, C., Williams, N.J., Ogedegbe, G., & Schoenthaler, A. (2014). Psychosocial risk factors for hypertension: an update of the literature. *Current Hypertension Reports*, 16: 483.
15. Domes, G., Spenthof, I., Radtke, M., Isaksson, A., Normann, C., Heinrichs, M. (2016). Autistic traits and empathy in chronic vs. episodic depression. *J. Affect. Disord.* 195, 144-7.
16. Effective Public Health Practice Project (1998). Quality Assessment Tool For Quantitative Studies. <https://merst.ca/ephpp/> (accessed February 2018)
17. George, L.K., Blazer, D.G., Hughes, D.C., Fowler, N. (1989). Social support and the outcome of major depression. *Br. J. Psychiatry.* 154, 478–485.
18. Gupta, J., Mattoo, S.K., Basu, D., Sarkar, S. (2014). Psychiatric Morbidity, Social Support, and Coping in Wives of Alcohol and Opioid Dependent Men. *Int. J. Ment. Health.* 43 (2), 81-94.
19. Hansson, L. (2006). Determinants of quality of life in people with severe mental illness. *Acta Psychiatr. Scand. Suppl.* 429, 46-50.
20. Hatcher, S., Stubbersfield, O. (2013). Sense of Belonging and Suicide: A Systematic Review. *The Canadian Journal of Psychiatry*, 58(7): 432-436.
21. Hays, J.C., Krishnan, K.R., George, L.K., Pieper, C.F., Flint, E.P., Blazer, D.G. (1997). Psychosocial and physical correlates of chronic depression. *Psychiatry Res.* 72 (3), 149-159.
22. Hirschfeld, R.M., Klerman, G.L., Andreasen, N.C., Clayton, P.J., Keller, M.B. (1986). Psycho-social predictors of chronicity in depressed patients. *Br. J. Psychiatry.* 48, 648-654.
23. Holt-Lundstad, J., Smith, T.B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: a meta-analytic review. *Perspectives on Psychological Science*, 10(2) 227-237.
24. Holt-Lundstad, J., Smith, T.B., Layton, J.B. (2010). Social relationships and mortality risk: a meta-analytic review. *PloS Med.* 7 (7), 1–19.
25. Hölzel, L., Härter, M., Reese, C., Kriston, L. (2011). Risk factors for chronic depression-- a systematic review. *J. Affect. Disord.* 129 (1-3), 1-13.
26. Honkalampi, K., Hintikka, J., Haatainen, K., Koivumaa-Honkanen, H., Tanskanen, A., Viinamäki, H. (2005). Adverse childhood experiences, stressful life events or demographic factors: which are important in women's depression? A 2-year follow-up population study. *Aust. N. Z. J. Psychiatry.* 39 (7), 627-632.

27. Klein, D.N., Santiago, N.J. (2003). Dysthymia and chronic depression: Introduction, classification, risk factors and course. *J. Clin. Psychol.* 59, 807–816.
28. Klein, D.N., Taylor, E.B., Dickstein, S., Harding, K. (1988a). Primary early-onset dysthymia: comparison with primary nonbipolar nonchronic major depression on demographic, clinical, familial, personality, and socioenvironmental characteristics and short-term outcome. *J. Abnorm. Psychol.* 97 (4), 387-398.
29. Klein, D.N., Taylor, E.B., Harding, K., Dickstein, S. (1988b). Double depression and episodic major depression: demographic, clinical, familial, personality, and socioenvironmental characteristics and short-term outcome. *Am. J. Psychiatry.* 145 (10), 1226-1231.
30. Klerman, G.L., Endicott, J., Spitzer, R.L., Hirschfeld, R.M. (1979). Neurotic depressions: A systematic analysis of multiple criteria and meanings. *Am. J. Psychiatry.* 136, 57-61.
31. Kulhara, P., Chopra, R., (1996). Social support, social dysfunction and stressful life events in neurotic patients. *Indian J. Psychiatry.* 38 (1), 23-29.
32. Jobst, A., Brakemeier, E.L., Buchheim, A., Caspar, F., Cuijpers, P., Ebmeier, K.P., Falkai, P., Jan van der Gaag, R., Gaebel, W., Herpertz, S., Kurimay, T., Sabaß, L., Schnell, K., Schramm, E., Torrent, C., Wasserman, D., Wiersma, J., Padberg, F. (2016). European Psychiatric Association Guidance on psychotherapy in chronic depression across Europe. *Eur. Psychiatry.* 33, 18-36.
33. Leigh-Hunt, N., Bagguley, D., Bash, K., Turner, V., Turnbull, S., Valtorta, N., Caan, W. (2017). An overview of systematic reviews on the public health consequences of social isolation and loneliness. *Public Health.* 152, 157-171.
34. Li, H., Ji, Y., Chen, T. (2014). The roles of different sources of social support on emotional well-being among Chinese elderly. *PloS ONE.* 9 (3), e90051.
35. Magne-Ingvar, U., Ojehagen, A., Traskman-Bendz, L. (1992). The social network of people who attempt suicide. *Acta Psychiatr. Scand.* 86, 153-158.
36. McCullough, J.P., McCune, K.J., Kaye, A.L., Braith, J.A., Friend, R., Roberts, W.C., Belyea-Caldwell, S., Norris, S.L., Hampton, C. (1994a). Comparison of a community dysthymia sample at screening with a matched group of nondepressed community controls. *J. Nerv. Ment. Dis.* 182 (7), 402-407.
37. McCullough, J.P., McCune, K.J., Kaye, A.L., Braith, J.A., Friend, R., Roberts, W.C., Belyea-Caldwell, S., Norris, S.L., Hampton, C., (1994b). One-year prospective replication study of an untreated sample of community dysthymia subjects. *J. Nerv. Ment. Dis.* 182 (7), 396-401.

38. Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G., The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med.* 6 (7), e1000097.
39. Nagy, E., Moore, S. (2017). Social interventions: An effective approach to reduce adult depression? *J. Affect. Disord.* 218, 131-152.
40. Orsini, M.R.deC.A., Ribeiro, C.R. (2012). Impact of dysthymic disorder chronicity on quality of life. *Estudos de Psicologia (Campinas)*. 29 (Supl.), 709s-717s.
41. Palumbo, C., Volpe, U., Matanov, A., Priebe, S., Giacco, D. (2015). Social networks of patients with psychosis: a systematic review. *B.M.C. Res. Notes.* 8, 560-571.
42. Pettit, J.W., Roberts, R.E., Lewinsohn, P.M., Seeley, J.R., & Yaroslavsky, I. (2011). Developmental relations between perceived social support and depressive symptoms through emerging adulthood: blood is thicker than water. *Journal of Family Psychology*, 25(1): 127-36.
43. Santini, Z.I., Koyanagi, A., Tyrovolas, S., Mason, C., Haro, J.M. (2015). The association between social relationships and depression: A systematic review. *J. Affect. Disord.* 175, 53–65.
44. Spijker, J., de Graaf, R., Bijl, R.V., Beekman, A.T., Ormel, J., Nolen, W.A. (2004). Determinants of persistence of major depressive episodes in the general population. Results from the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *J. Affect. Disord.* 81 (3), 231-240.
45. Subodh, B.N., Avasthi, A., Chakrabarti, S. (2008). Psychosocial impact of dysthymia: a study among married patients. *J. Affect. Disord.* 109 (1-2), 199-204.
46. Szádóczy, E., Rózsa, S., Zámboi, J., Füredi, J. (2004). Predictors for 2-year outcome of major depressive episode. *J. Affect. Disord.* 83 (1), 49-57.
47. World Health Organization (2017). *Depression and Other Common Mental Disorders: Global Health Estimates*. Licence: CC BY-NC-SA 3.0 IGO.

Fig. 1 PRISMA Flow Diagram reporting studies selection process



Tab. 1 Risk of bias assessment

Study	EPHPP Quality Assessment Tool for Quantitative Studies									
	Selection Bias	Study Design	Confounders	Blinding	Data Collection	Withdrawals and Dropouts	Global Rating			
Ajinkya et al., 2015	2	3	3	2	1	3	3			
Baines, 2000	2	3	3	3	3	2	3			
Cornelis et al., 1989	2	2	1	2	2	n/a	1			
Cramer et al., 2010	3	3	3	2	1	n/a	3			
George et al., 1989	2	2	3	2	1	1	2			
Gupta et al., 2014	2	3	1	2	1	2	2			
Hays et al., 1997	2	2	1	2	1	2	1			
Hirschfeld et al., 1986	2	2	1	2	1	2	1			
Honkalampi et al., 2005	2	3	2	2	1	1	2			
Klein et al., 1988a	2	2	1	2	1	2	1			
Klein et al., 1988b	2	2	1	2	1	2	1			
Kulhara and Chopra, 1996	2	2	3	2	1	2	2			
Magne-Ingvar et al., 1992	2	3	3	2	1	2	3			
McCullough et al., 1994a	3	2	1	2	1	n/a	2			
McCullough et al., 1994b	3	2	3	2	1	1	3			
Spijker et al., 2004	2	3	3	2	1	n/a	3			
Subodh et al., 2008	2	2	1	2	1	2	1			
Szadoczky et al., 2004	2	2	3	2	1	2	2			
Study	CASP Qualitative Research Checklist									
	Aim	Methodology	Design	Recruitment	Data Collection	Relationship	Ethical Issue	Analysis	Finding	Valuable
Orsini and Ribeiro, 2012	Yes	Yes	Yes	Can't Tell	Can't Tell	Can't Tell	Can't Tell	Yes	No	Can't Tell

Tab. 2 Patients' characteristics and social networks

Study	Sample / Gender	Age	Diagnose / Classification	Social Network Assessment	Social Networks	
					Chronic Depressed Group	Comparison Group
No comparison group						
Baines, 2000	4 F=4	Range 21- 65y	<u>Dysthymia</u>  DSM-IV-R	Semi-structured in depth interview	Named social network members (n): 2 Pat.: n=5 (father,	-

					mother, boyfriend, friends), 1 Pat.: n=3 (father, mother, ex-boyfriend), 1 Pat.: n=4 (father, mother, husband, sister)	
McCulloch et al., 1994b	24 F=18 M=6	Range 19-73y Mean=39.7y	<u>Dysthymia</u> =13% <u>Depression</u> =88%  DSM-III, DSM-III-R	<u>Double</u>  Interpersonal Support Evaluation Checklist	Mean at baseline: appraisal=4.67, belonging=4.46, tangible=6.75, self-esteem=5.21  Mean at final interview: appraisal=4.00 (NS), belonging=4.50 (NS), tangible=7.05 (NS), self-esteem=5.20 (NS)	-
Orsini and Ribeiro, 2012	24 F=18	Range 26-70y Mean=42y	<u>Dysthymia</u> <u>Double Depression</u>	Semi-structured interview	Themes: - dysthymic people feel lonely; - intimate relationships that are conflictual worsen patients' condition; - problems in social relationships worsen the symptoms; - despite social support dysthymic symptoms may persist	-
Spijker et al., 2004	250 F=167	Range: 18-24y n=16 25-34y n=91 35-44y n=67 45-	<u>Major Depressive Episode</u>  DSM-III-R	Social Support Questionnaire for Satisfaction	Low=(n=82) Medium=(n=85) High=(n=83)	-

		54y n=53 55- 64y n=23			
--	--	-----------------------------------	--	--	--

Tab. 2 Patients' characteristics and social networks

Comparison with healthy population						
Cornelis et al., 1989	24 F=13 M=11	Range 21- 60y	<u>Unipolar Major Depression</u> (n=10)  <u>Dysthymia</u> (n=14)  DSM-III	Number of friends and geographic distance, Frequency of two types social contacts (superficial and deep), Personal evaluation of quality of social network	Mean: total score: before depression=7.3, during=6.1 (NS) number, proximity friends: before=3.6, during=3.3 (NS) contact frequency friends: before=3.6, during=3.1 (NS) personal evaluation of social network: before=6.5, during=6.1 (NS)	Mean: total score=9.9 (p<0.05) number, proximity friends= 5.0 (p<0.05) contact frequency friends= 4.9 (NS) personal evaluation of social network= 7.3 (NS)
Cramer et al., 2010	22 -	-	<u>Dysthymia</u>  DSM-III-R	Quality of Life	Mean: contact with friends=-0.27 contact with family of origin=-0.69 support if ill=-0.69 neighbourhood quality=-0.35	Mean: contact with friends=-0.06 (NS) contact with family of origin=0.07 (p<0.05) support if ill=0.08 (p<0.05) neighbourhood quality=0.04 (NS)
Gupta et al., 2014	8 -	Mean=37y	<u>Dysthymia</u>  DSM-IV	Social Support Questionnaire	Total score=46.0	Total score=49.1 (NS)
Honkalampi et al., 2005	73 F=73	Range 26- 65y	<u>Depression</u>	"Do you receive enough support and understanding for your	Insufficient social support=38.4%	Insufficient social support=4.2% (p<0.001)

				problems from those closest to you?"		
McCullough et al., 1994a	24 F=18 M=6	Range 19-73y Mean=39.7y	<u>Dysthymia</u> DSM-III-R	Interpersonal Support Evaluation Checklist	Mean: appraisal=4.7 belonging=4.5 tangible=6.8 self-esteem=5.2	Mean: appraisal=8.5 (p<0.0001) belonging=8.5 (p<0.0001) tangible=9.4 (p<0.001) self-esteem=8.6 (p<0.0001)
Subodh et al., 2008	30 F=22 M=8	Mean=38.2y	<u>Dysthymia</u> DSM-IV	Social Support Questionnaire	Mean: SSQ total score=49.67	Mean: SSQ total score=64.75 (p<0.0001) SSQ total score=60.99 (p<0.0001)

Tab. 2 Patients' characteristics and social networks

Comparison with non-chronic major depression						
George et al., 1989	77 F=52 M=25	Range: 35-50y=49% 60+y=51%	<u>Dysthymia</u> DSM-III	Duke Social Support Index	Social network: impaired=43% Social interaction: impaired=29% Instrumental support: impaired=13% Subjective social support: impaired=27%	Social network: impaired=57% (NS) Social interaction: impaired=16% (p<0.05) Instrumental support: impaired=11% (NS) Subjective social support: impaired=6% (p<0.001)
Hays et al., 1997	88 F=59 M=29	Range: 18-59y n=55 60+y n=33	<u>Major Depressive Episode</u> DSM-III-R	Duke Social Support Index	Mean: non-household social interaction=4.6 subjective social support=21.0	Mean: non-household social interaction=5.3 (prob.=0.01) subjective social support=22.7 (prob.=0.0004)
Hirschfeld et al., 1986	19 F=14 M=5	Mean=42.6y	<u>Major Depressive Disorder</u>	Personal Resources Inventory interview	NS difference between the two groups regarding social support that patients could "count on". (Exact data not reported)	



Klein et al., 1988a	32 F=25 M=7	Mean=28.4y	<u>Primary Early Onset Dysthymia</u> DSM-III-R	Interpersonal Support Evaluation (self-esteem subscale not included)	Mean: appraisal=4.8 belonging=3.8 tangible support=6.2	Mean: appraisal=6.5 (p<0.05) belonging=6.5 (p<0.001) tangible support=7.7 (p<0.05)
Klein et al., 1988b	31 F=24	Mean=28.3y	<u>Double Depression</u> DSM-III	Interpersonal Support Evaluation List (self-esteem subscale not included)	Mean score=15.3	Mean score=22.1 (p<0.001)
Magne-Ingvar et al., 1992	22 -	-	<u>Dysthymia</u> DSM-III-R	Interview Schedule for Social Interaction	Pat. with dysthymia more often insufficient social interaction than major depression (p<0.01). In all subscales, except the availability of social integration (AVSI), the Pat. with dysthymia scored lower than major depression (p<0.05) (Exact data not reported)	

Tab. 2 Patients' characteristics and social networks

Subodh et al., 2008	30 F=22 M=8	Mean=38.2y	<u>Dysthymia</u> DSM-IV	WHO Quality Of Life-Bref Version, Social Support Questionnaire	Mean: WHO-social relationship =9.76 SSQ total score=49.67	Mean: WHO-social relationship=10.26 (NS) SSQ total score=55.27 (p<0.05)
Szadocky et al., 2004	34 F=25	Mean=44.1y	<u>Major Depressive Episode</u> DSM-IV	Support Dimension Scale	Social support=8.8	Social support=13.1 (p=0.01)
<b>Comparison with other mental disorders</b>						
Ajinkya et al., 2015	30 F=20 M=10	Mean=46.1y	<u>Dysthymia</u> DSM-5	WHO Quality Of Life-Bref Version	Median WHO-social relationships =19	Schizophrenia - Median WHO-social relationships =6 (p=0.001)
Kulhara and Chopra, 1996	81 F=42 M=39	Mean=34.09y	<u>Dysthymia</u> ICD-10	Social Support Questionnaire	Mean score=42.01	General Anxiety Disorder - Mean score=47.10 (p<0.01) Dissociative Disorders -

						Mean score=45.27 (p<0.01)
Magne-Ingvar et al., 1992	22	-	<u>Dysthymia</u> DSM-III-R	Interview Schedule for Social Interaction	Pat. with dysthymia more often insufficient social interaction than substance abuse (p<0.05) and adjustment disorders (p<0.001). Pat. with dysthymia less satisfied than all other groups with their social integration (ADSI subscale, p<0.01) and deep emotional relations (ADAT subscale, p<0.05). (Exact data not reported)	
Pat., Patients; F, Female; M, Male; y, year; SSQ, Social Support Questionnaire; NS, No Significant						