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Research paper

A study in the general population about sadness to disentangle the continuum from well-being to depressive disorders

Sarah Tebeka[a,b,c,*], Baptiste Pignon[d,e,f,g], Ali Amad[h,i], Yann Le Strat[a,b,c], Clara Brichant-Petitjean[j], Pierre Thomas[h,i,k], Guillaume Vaiva[h,i,k], Jean-Luc Roelandt[l,m], Imane Benradia[l,m], Bruno Etain[c,f,n,o,p], Benjamin Rolland[q,r], Caroline Dubertret[a,b,c], Pierre A. Geoffroy[c,f,n,o,p]

[a] APHP, Louis Mourier, Department of Psychiatry, Colombes, France
[b] Centre for Psychiatry and Neurosciences, Inserm (French National Institute of Health and Medical Research) U894, Paris, France
[c] University Paris 7 Denis Diderot, Faculty of Medicine, Paris, France
[d] Inserm (French National Institute of Health and Medical Research), U955, team 15, Créteil, France
[e] AP-HP, DHU PePSY, Hôpitaux universitaires Henri-Mondor, Pôle de Psychiatrie et d'Addictologie, Créteil, France
[f] Fondation FondaMental, Créteil, France
[g] UPEC, University Paris-Est, Faculté de médecine, Créteil, France
[h] Univ Lille, CNRS UMR-9193 (SCA-Lab), France
[i] CHU Lille, Hôpital Fontan (CURE), F-59000 Lille, France
[j] EPS Maison Blanche, Hôpital Henri Ey, Secteur 75G20-21, Paris, France
[k] Fédération régionale de recherche en santé mentale (F2RSM) Nord - Pas-de-Calais, F-59000 Lille, France
[l] Inserm, UMRS 1123, ECEVE - University Paris Diderot, Site Villemin 10 avenue de Verdun, Paris F-75010, France
[m] WHO Collaborating Centre for Research and Training in Mental Health, EPSM LilleMétropole, 211 Rue Roger Salengro, 59260 Hellemmes-Lille France
[n] Inserm, U1144, Paris F-75006, France
[o] AP-HP, GH Saint-Louis – Lariboisière – F. Widal, Pôle de Psychiatrie et de Médecine Addictologique, 75475 Paris cedex 10, France
[p] Université Paris Descartes, UMR-S 1144, Paris F-75006, France
[q] PSYR2, CNRL, Inserm U1028 / CNRS UMR5292, Université Lyon 1, Bron, France
[r] Pôle UP-MOPHA, CH le Vinatier, Bron, France

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ABSTRACT

Objective: Sadness is both a common experience in general population and one of the main criteria of major depressive disorder (MDD). We tested the hypothesis of a depressive continuum using sadness as an intermediate experience between well-being and disorder.

Methods: A French cross-sectional Mental Health survey in General Population interviewed 38,694 individuals. We examined prevalences and compared sociodemographic correlates and psychiatric disorders of individuals in 3 independent groups 1) MDD, 2) sadness without MDD, and 3) controls.

Results: The prevalence of sadness was of 29.8% in the whole sample and of 93% in subjects suffering from MDD (n = 4976). The "sadness" group shared the same sociodemographic patterns as the "MDD" group. All psychiatric disorders assessed (i.e. bipolar disorder, anxiety disorder, alcohol use disorder, psychotic disorder and suicide attempts) were significantly associated with both "sadness" and "MDD" groups compared to "controls". Individuals with sadness, compared to those with MDD, were significantly less likely to meet the criteria for all psychiatric disorders. MDD's sensitivity of sadness was 94,2%.

Limitations: Even though we used a quota sampling method, the sample was not strictly representative of the general population.

Conclusion: Sadness validates the depressive continuum hypothesis, since it is more frequent in the general population than MDD itself and at the same time shares with MDD the same sociodemographic and clinical correlates. A gradual association from controls to MDD was observed for psychiatric comorbidities. Finally, the high sensitivity of sadness may suggest its use to screen at-risk individuals converting from well-being to full psychiatric disorders.

Abbreviations: AOR, adjusted odd ratio; AUD, alcohol use disorder; BD, bipolar I disorder; CI, confidence interval; GAD, generalized anxiety disorder; MDD, major depressive disorder; OR, odd ratio; PTSD, post-traumatic stress disorder; SE, sensitivity; SP, specificity

* Corresponding author at: APHP, Louis Mourier, Department of Psychiatry, Colombes, France.
E-mail address: sarah.tebeka@aphp.fr (S. Tebeka).

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1. Introduction

Over the last decades, increasing interest has emerged regarding the continuum between mental health and mental disorders (Ayuso-Mateos et al., 2010; Kingdon, 2009; Leboyer and Schurhoff, 2014; Lewinsohn et al., 2000; Shevlin et al., 2016). The continuum of psychiatric disorders has been especially studied in psychosis since a 7.2% prevalence rate of psychotic symptoms was found in the general population (Linscott and van Os, 2013a), which is tenfold higher than the prevalence of characterized psychotic disorders (Saha et al., 2005). A continuum of psychiatric disorders implies that a core symptom of a psychiatric disorder is also found in non-clinical populations. To confirm the psychotic continuum hypothesis, Linscott and van Os have proposed that two conditions should be fulfilled: i) psychotic symptoms should occur in non-clinical populations and their prevalence in the general population must be higher than characterized psychotic disorders itself; ii) psychotic symptoms and characterized psychotic disorders should share same correlates and risk factors (van Os et al., 2009). Most psychotic symptoms in the general population have been shown to be isolated and transitory, but they may also become abnormally persistent and subsequently clinically relevant. This phenomenon partly depends on the degree of environmental risk exposures (Kaymaz et al., 2012), thus demonstrating a severity continuum between normal manifestations and pathological disorders (van Os et al., 2010). Interestingly, psychotic symptoms are transdiagnostic and can also be associated with non-psychotic disorders such as anxiety or mood disorders (Saha et al., 2012).

A few studies have investigated the continuum hypothesis in other psychopathological contexts. Interestingly, sadness is a common experience in the general population. It is both a physiological emotion and an affective symptom required for diagnostic criteria of psychiatric disorders such as MDD. However, when sadness is isolated, it is not sufficient to establish the diagnosis of depression (American Psychiatric Association, 2013). In a large European prospective survey evaluating 11,299 subjects, 12.5% met CIDI criteria for sadness and/or anhedonia without major depressive disorder (MDD) (Moreno-Küstner et al., 2016). Sadness is also associated with a higher risk of developing MDD in certain specific populations (Sarkar et al., 2015). Thus, we hypothesize that sadness might be a symptom which lies on a continuum ranging from well-being to depressive disorders. Moreover, according to the paradigm of a symptom severity continuum, sadness might be an index of psychopathological severity. Indeed, while being at one end of this continuum when associated with MDD, sadness may also be associated with other psychiatric disorders, such as anxiety disorders or substance use disorders. The World Health Survey supported by the World Health Organization (WHO) found that subsyndromal depression and brief depressive episodes presented the same pattern of risk factors as more severe forms of MDD (Ayuso-Mateos et al., 2010; Linscott and van Os, 2013b). These results support a depressive continuum, with increasing severity of depressive symptoms ranging from either no symptom or non-specific symptoms in general population to MDD. However, to the best of our knowledge, no studies have specifically investigated this hypothesis using a frequent and nonspecific symptom such as sadness.

Our study had a twofold aim. The first objective was to validate the depressive continuum hypothesis by following the method proposed by van Os and Linscott (Linscott and van Os, 2013b) by way of i) assessing the prevalence of sadness in the general population and in patients with MDD, and ii) comparing the sociodemographic correlates of subjects with sadness and subjects with MDD. Secondly, we seeked to demonstrate a continuum of severity by examining associations between sadness and other psychiatric disorders. Therefore, we investigated prevalence rates of psychiatric disorders in 3 subgroups: subjects without MDD or sadness ("controls"), subjects with sadness but without MDD ("sadness" group), and subjects with MDD ("MDD" group). Our hypothesis is that the "sadness" group presents more psychiatric disorders than controls, but less than individuals with MDD.

2. Methods

2.1. Mental Health in General Population (MHGP) survey

The cross-sectional MHGP survey, conducted by the World Health Organization Collaborating Centre (WHO-CC), interviewed 38,694 subjects in France between 1999 and 2003. These subjects were selected in 47 different sites (900 subjects per site) by a quota sampling method (Lunsford and Lunsford, 1995). This method develops a sample of subjects with the same characteristics as the general population in terms of age, gender, educational level and occupational category, according to census figures from 1999 provided by the French National Institute for Statistics and Economic Studies. Subjects were included in the study if they met the following criteria: 1) provided informed consent to participate in the survey, 2) spoke French, 3) were aged 18 and above, and 4) were neither institutionalized nor homeless. Additional methodological details can be found elsewhere (Amad et al., 2013; Caria et al., 2010; Grolleau et al., 2008; Leray et al., 2011; Pignon et al., 2017a, 2017b; Rolland et al., 2017). Legal authorization was obtained by the "Commission Nationale Informatique et Liberté" (CNIL) and the "Comité consultatif sur le traitement de l'information en matière de recherche" (CCTIRS), with number 98.126.

2.2. Sociodemographic characteristics

Age was categorized into four age groups (18–29 years, 30–44 years, 45–59 years, 60 + years). Household income was categorized as low (< 1650€/household monthly), medium (1650–3200€) or high (> 3200€).

In light of the literature on migrant populations (Cantor-Graae and Pedersen, 2013; Selten et al., 2012; Tortelli et al., 2013), we defined a migrant as first-generation migrant (a subject born outside of metropolitan France), second-generation migrant (at least one parent born outside of metropolitan France), or third generation migrant (at least one grandparent born outside of metropolitan France). Migrant generations were exclusive from each other.

Psychological trauma history was assessed using the first question of the Posttraumatic Stress Disorder section of the MINI, i.e.: "Have you ever experienced or witnessed or had to deal with an extremely traumatic event that included actual or threatened death or serious injury to you or someone else?" (examples or traumatic events were then cited: serious accidents, physical assault, terrorist attack, etc.).

2.3. Assessment of psychiatric disorders

For each subject, the Mini International Neuropsychiatric Interview (MINI, French version 5.0.0), a structured diagnostic interview, was used to screen for lifetime psychiatric disorders (according to the 10th International Classification of Diseases (ICD-10)), in the general population. MDD included dysthymia, recurrent depression, and major depressive disorder according to ICD-10 criteria. The MINI has been validated in the general population and has a good to very good validity, reliability (inter-rater and test-retest), sensitivity and specificity (Sheehan et al., 1997). For current MDD (*F32*), kappa, sensitivity, specificity and positive predictive values are respectively 0.74, 0.93, 0.80 and 0.92 (Amorim et al., 1998). Sadness during the last two weeks was assessed by one question: "have you been consistently depressed or down, most of the day, nearly every day, for the past two weeks?". All of the MHGP interviewers (nurses and psychologists) were trained to use the MINI by means of video recordings of interviews over a 3-day session provided by WHO-CC experts.

Several psychiatric disorders were also assessed: bipolar I disorder (BD) (diagnosed if there was a history of manic episode, *F30*), past-year alcohol use disorder (AUD) (history of alcohol dependence (*F10.2*)) and