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Population-based cost–offset estimation for the treatment of borderline personality disorder: Projected costs in a currently running, ideal health system

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ABSTRACT

Borderline personality disorder (BPD) is considered one of the most expensive mental disorders in terms of direct and indirect costs. The aim of this study was to carry out a cost–offset estimation of disorder-specific psychotherapy for BPD at the population level. The study investigated whether the possible financial benefits of dialectical behavior therapy outweigh the therapy costs, assuming a currently running, ideal health system, and whether the estimated cost–benefit relationships change depending upon the number of patients willing to be treated. A formula was elaborated that allows the user to calculate cost–benefit relationships for various conservative or progressive scenarios, with different stages of individuals' willingness to be treated (10%–90%). The possible costs and benefits of BPD-related treatment were evaluated using a 12-month, prevalence-based approach. The annual costs for untreated BPD were 8.69 billion EUR annually. The cost–benefit relationship for the treatment remained constant at 1.52 for all scenarios, implying that for each EUR invested, 1.52 EUR can be gained within one year, independent of the willingness to be treated. Additional intangible benefits were calculated with the aid of Quality-Adjusted Life Years. Findings suggest that BPD-related treatment might well be efficient at the population level.

Borderline personality disorder (BPD) is a life-threatening mental disorder that is strongly characterized by lifetime rates of approximately 70% for acts of self-injury, 80% for suicide attempts, and 10% for suicide (Black, Blum, Pfohl, & Hale, 2004; Linehan & Heard, 1999; Paris, 2002). The prevalence of BPD in the general population ranges from 0.5 to 1.4% (Samuels et al., 2002; Torgersen, Kringlen, & Cramer, 2001; Coid, Yang, Tyre, Roberts, & Ullrich, 2006; Lenzenweger, Lane, Loranger, & Kessler, 2007). Yet the proportion of patients with a diagnosis of BPD in psychiatric care ranges between about 15% of outpatients and 30% of inpatients (Alnæs & Torgersen, 1988; Zimmerman & Mattia, 1999; Loranger et al., 1994). Individuals with BPD require more treatment services than patients with other disorders (Bender et al., 2001; Zanarini, Frankenburg, Khera, & Bleichmar, 2001). Therefore, BPD is considered one of the most expensive mental disorders (Soeteman, Hakkaart-van Roijen, Verheul, & Busschbach, 2008; Van Asselt, Dirksen, Arntz, & Severens, 2007), causing high direct and indirect costs. Direct costs include all treatment costs that are directly associated with BPD (e.g., hospital days or emergency department visits). Indirect costs cover all costs that occur secondary to the disorder (e.g., production losses and sickness benefit payments due to days absent; e.g., Brent, 2008; Margraf, 2009). Additional losses can be expected in terms of intangible values, which refer to the reduced quality of life and suffering caused by BPD as well as "years lost" due to mortality.

To the best of our knowledge, so far only three studies have been conducted that investigated the issues of costs and benefits of therapy for BPD. (1) Using a prevalence-based, bottom-up approach, societal costs of BPD in the Dutch population were calculated, resulting in an estimation of costs at around 17,000 EUR per patient each year (Van Asselt et al., 2007). The overall annual costs covered healthcare, medication, informal care, productivity losses, and out-of-pocket expenses. In this study, one third of the people affected by BPD were fully disabled and those who were employed reported that they had been absent from their jobs for more than five weeks per year. (2) In another study on this sample, the cost-effectiveness of borderline-specific treatment was calculated (Van Asselt et al., 2008). Comparing schema-focused therapy (SFT) vs. transference-

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focused psychotherapy (TFP) for outpatients with BPD, the investment for SFT was lower (37,826 EUR for SFT vs. 46,795 EUR for TFP) while the recovery rate was higher (52% for SFT vs. 29% for TFP), implying that SFT is more efficient than TFP. The analyses considered a wide range of direct and indirect costs and intangible losses, but since the analyses considered cost-effectiveness, they were not transferred into financial values. (3) Comparing dialectical behavior therapy (DBT) vs. treatment-as-usual (TAU) for outpatients who predominantly suffered from BPD revealed that DBT was more expensive in terms of treatment costs (Priebe et al., 2012). In the additional cost-effectiveness analysis, health care outcomes related to self-injury were calculated. This analysis was not particularly specific to BPD, although most of the patients were affected by BPD. The analyses of these three studies were based on small sample sizes, ranging from 20 to 88 participants.

The aim of the present study was to carry out a population-based cost–offset estimation of psychological therapy for BPD, using data from the German health care system. The perspective is a societal one, considering the possible impact of therapy on direct and indirect costs for the health care system (hospital days, emergency department visits, sickness benefit payments), on society (unemployment, early retirement), and the economy (production losses, loss of gross value), as well as on intangible costs in the form of Quality-Adjusted Life Years (QALYs), a construct frequently used by the World Health Organization (e.g., Prüss-Üstün, Mathers, Corvalán, & Woodwair, 2003). The approach is prevalence-based and not incidence-based: Given a constant 12-month prevalence, the costs of BPD and the benefits of its treatment could be evaluated for this period. Thus, all individuals affected by BPD within one year were included in the estimation, irrespective of the duration of their illness. It was not assumed that the intervention reduced the prevalence at the population level; in other words, potentially deteriorating individuals or those newly diagnosed with BPD are already included in this prevalence. The study included the costs incurred by all patients who might be willing to undergo treatment within one year, as well as the benefits created by the patients whose symptoms improved within that one year. The individuals who were treated within the considered year were not necessarily the same individuals whose symptoms improved and who were responsible for the financial benefit within that year; i.e., running costs and running benefits were considered, but time trade-off was not. This implies the assumption of an "ideal health services system;" in other words, for each patient who might be willing to be treated, treatment can be offered promptly. The initial costs for the dissemination of the intervention were not taken into account. In contrast to some of the previous studies, which were *in medias res* or *ex post* studies, this study represents an *ex ante* estimation based on data provided by institutions like health insurance providers or the German pension fund. *Ex ante* analyses are usually carried out before a particular project is started in order to help decide whether resources should be allocated to that project, in contrast to *in medias res* or *ex post* studies, which evaluate the costs and benefits during (*in medias res*) or at the end (*ex post*) of a project. Generally, *ex ante* studies are less accurate than *in medias res* or *ex post studies* because the possible benefits and costs have to be estimated in advance and cannot be directly evaluated, as is possible at the end of a project (Boardman, Greenberg, Vining, & Weimer, 2011). The aim is to present a possible method of calculating costs and benefits of the treatment of BPD *ex ante*, which can be performed for any treatment approach if the relevant data are available.

Method

In order to carry out the cost–offset estimations, it was necessary to estimate (1) how many patients with BPD might be willing to be treated, (2) how many of these individuals would stay in therapy, and (3) to what extent their specific symptoms might be reduced.

The next step was to estimate (4) which direct costs might be saved through the reduction of symptoms, namely through the reduction of inpatient treatments in the form of emergency room visits and hospital stays; and (5) which indirect costs might be saved through the reduction of days absent, associated production loss, loss of gross value, payment of sickness benefits, unemployment, early retirement, and associated payments of unemployment benefits and early retirement pensions that might be reduced. In the next step (6), the costs incurred by treating the patients who were willing to be treated were estimated. These costs were compared to the direct and indirect cost savings. Whether cost–offset occurs, i.e., whether the financial benefit might outweigh the costs, and by how much, was evaluated with the aid of cost–benefit relationships. The last step (7) was to calculate additional intangible benefits that might be obtained through improvement of quality of life for patients affected by BPD, and the associated gain in QALYs as well as the reduction of "lost" QALYs through mortality due to suicide.

Data collection

To estimate the number of individuals affected by BPD within one year, a 12-month prevalence of 0.7% in the German population was assumed (Lenzenweger, 2008). Several institutions were contacted to collect the data necessary for the estimations. One of the large statutory health insurance providers (BKK Bundesverband) provided us with an extensive dataset about days absent, sickness benefit days, and hospital days due to the diagnosis of BPD. The German statutory pension insurance plan (Deutsche Rentenversicherung, DRV) provided us with a dataset about early retirements in 2012 that were caused by BPD. The included cases were diagnosed in accordance with the ICD-10 diagnoses covering F60.3X (emotionally unstable personality disorders, impulsive and borderline type) and only data of individuals between 20 and 59 years of age was included. Thus, the analyses refer to the adult German population. In order to estimate the costs due to early retirement, an exemplary calculation of the amount of an average payment for early retirement was included. We searched the health reports of large statutory health insurance providers (Allgemeine Ortskrankenkasse, AOK; Betriebskrankenkassen, BKK; Deutschen Angestellten-Krankenkasse, DAK; and Techniker Krankenkasse, TK) for data about the costs of sickness benefits and hospitalization. We interviewed the resident experts at health insurance providers and hospitals, and searched databases of the Federal Health Monitoring Authority (Gesundheitsberichterstattung des Bundes, GBE-Bund) and publications of the Federal Ministry of Health (Bundesministerium für Gesundheit, BMG) for data about the costs of emergency services. Statistics as to demographics, the working population, and income were available via the Regional Accounts (Volkswirtschaftliche Gesamtrechnungen der Länder, VGRdL). Statistics about the average unemployment benefit were provided by the Federal Employment Agency (Bundesagentur für Arbeit). The estimations of the treatment costs were based on the current physicians' fee schedule for psychotherapy (Kassenärztliche Bundesvereinigung, 2012), valid in Germany. Additional intangible benefits in the form of improved quality of life and life years gained were estimated with the aid of QALYs.

Treatment

At present, there are several relevant types of psychotherapy for BPD, such as cognitive-behavioral therapy, psychodynamic therapy,