Actor-partner interdependence analysis in depressed patient-caregiver dyads: Influence of emotional intelligence and coping strategies on anxiety and depression

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A R T I C L E  I N F O

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A B S T R A C T

Objective: Major depressive disorder (MDD) is a leading cause of suffering for both patients and their natural caregivers. A preliminary study highlights the association of emotional intelligence (EI) and coping strategies with quality of life. However, there is a lack of studies concerning dyadic (i.e., patient and natural caregiver) characteristics' impact on anxious and depressive symptoms. In a sample of MDD patients-caregivers dyads, we explored the influence of EI and coping strategies on anxious and depressive symptoms using the actor-partner interdependence model (APIM).

Methods: The cross-sectional study included 79 MDD patient-caregiver dyads. Self-reported data, completed by patients and their primary caregivers, were collected including socio-demographic, EI using TEIQue-SF, coping strategies using BriefCope, depressive symptoms using Beck Depression Inventory, anxious symptoms using STAI. The APIM was used to test the dyadic effects of EI and coping strategies on anxious and depressive symptoms, using structural equation modelling.

Results: Patients and caregivers reported both anxious and depressive symptoms. Coping strategies, such as problem solving, positive thinking and avoidance, exhibited evidence of actor (degree to which the individual's coping strategies are associated with their own anxiety or depression level) and partner effect (degree to which the individual's coping strategies are associated with the anxiety or depression level of the other member of the dyad). The caregivers' EI was associated with a decrease of their own depression level contrary to patients for which the results were not significant. The patients' and caregivers' EI was associated with a decrease of their own level of anxiety.

Conclusion: EI and coping strategies were moderately associated with anxious and depressive symptomatology among MDD patient-caregiver dyads. These results suggest that targeted interventions could be proposed to both patients and caregivers.

1. Introduction

Major depressive disorder (MDD) is an important cause of suffering for patients, but MDD also affects patients' families and caregivers (Heru et al., 2004; Heru and Ryan, 2004; Magne-Ingvar and Ojehagen, 2005). Caregivers of patients with MDD experience burden across multiple life domains (e.g. emotional, social, physical, financial and relationship burden) that affects their ability to care for the patient and deteriorates their health. As a result of this burden associated with patients' symptomatology, caregivers report anxious and depressive symptoms (Jenkins and Schumacher, 1999; Kumar and Gupta, 2014). Patient and caregiver constitute a dyad, i.e. attributes and behaviours of one dyad member can affect the mental health state of the other individual (Kenny and Cook, 1999). However, little is known about the interactions within dyads in the specific context of MDD. There is thus a need in understanding how patients and caregivers interact within the dyad to cope with symptomatology and problems of daily life. Coping is usually defined as thoughts and behaviours that are implemented to manage internal and external demands of situations appraised as stressful (Lazarus and Folkman, 1984). The literature generally opposes

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active coping strategies considered as an efficient method to address stressful events, to passive coping strategies considered as a psychological risk factor for adverse responses to stressful life events (Boyer et al., 2017; Holahan and Moos, 1987). In addition, emotional intelligence (EI) (i.e. the capacity of individuals to recognize their own and other people's emotions and to use emotional information to guide thinking and behaviour) influences interactions within the dyads (Mayer et al., 1990, 2008a) and is predictive of psychological adjustment and correlated positively with psychological well-being (Austin et al., 2005; Ciarrochi et al., 2002; Schutte et al., 2002).

To date, very few works have addressed the dyad situation in the context of MDD. Most studies have examined the influence of each person's characteristics based on the independence assumption (i.e. uncorrelated observations among dependent variables). But recent studies reported that the independence assumption is violated in dyads because the relationship between patients and caregivers is deeply interdependent. One of the appropriate way to measure this interdependence is the actor-partner interdependence model (APIM) (Kenny et al., 2006). Previous studies using APIM explored relationships between patients and caregivers in cancer (Baumstarck et al., 2016; Goldzieg et al., 2016), heart failure (Chung et al., 2009) and hearing loss (Lazzarotto et al., 2016). To our knowledge, no study used the APIM method to examine dyads in MDD, except one on reciprocal criticism in a small sample of 33 MDD patients and their spouses (Peterson and Smith, 2010) and one on quality of life (Boyer et al., 2017).

The objective of this study was to examine the influence of EI and coping strategies on the level of depression and anxiety among MDD patients-caregivers dyads using APIM.

2. Methods

2.1. Design, setting and procedure

We conducted a cross-sectional study in the psychiatric department of a French public teaching hospital in the South of France (Marseille). The recruitment of patient-caregiver dyads was conducted during a 6 months period. Health care staff identified inpatients who had a diagnosis of MDD according to the DSM-IV criteria (American Psychiatric Association, 2000), were between 18 and 64 years old and had been hospitalized for at least 48 h. Each patient was asked by medical or nursing staff to name his or her primary natural or family caregiver and whether we could contact the caregiver. A caregiver, or informal caregiver is an unpaid individual involved in assisting others with activities of daily living and/or medical tasks (EUFAMI Guide to Caregivers, 2017).

If the patient and the caregiver agreed and met the inclusion criteria, the data were collected via self-report questionnaires on the discharge day. The study was conducted in accordance with the Helsinki Declaration and French laws and regulations (Code de la Santé Publique, article L.1121-1/Loi de Santé Publique no. 2004-806 du 9 août 2004 relative à la politique de santé publique et ses décrets d’application du 27 août 2006). The data collection was approved by the Commission Nationale de l’Informatique et des Libertés (CNIL no. 1223715). All the patients were informed of the study and gave their written, informed consent after a standardised and structured clinical interview.

2.2. Data collection

The same data were collected for the patient and the caregiver and included the following socio-demographic characteristics: gender, age, marital status (single, couple), educational level (< 12 years, > = 12 years), employment status (with, without employment) and the relationship between the patient and caregiver (partner, not partner).

Depression severity was assessed using the Beck Depression Inventory Short-Form (13 items) (Beck and Beamesderfer, 1974). Higher scores indicate more severe symptomatology.

Anxiety severity was assessed using the state-trait anxiety inventory (STAI (Spielberger and Gorsuch, 1970)). The STAI consists of two subscales: “state anxiety” (STAI-YA), or the transitory emotional response to a stressful situation, and “trait anxiety” (STAI-YB), or the relatively stable and long-standing disposition to respond to stress (Spielberger et al., 1993). Our sample only fulfilled the STAI-YB. Higher scores indicate more severe symptomatology.

EI was assessed using the Trait Emotional Intelligence Questionnaire - Short Form (TEIQue-SF) (Cooper and Petrides, 2010; Mikolajczak et al., 2007a; Petrides, 2009). It's a self-report questionnaire of 30 items that provide a global score of general emotional functioning; higher scores indicate higher trait EI.

Coping strategies were assessed using the Brief Coping Orientation to Problems Experienced Scale (BriefCope) (Carver, 1997; Muller and Spitz, 2003). It’s a multidimensional measure that presents fourteen scales all assessing different coping dimensions. This questionnaire includes 28 items that explore the following 14 strategies: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioural disengagement, venting, positive reframing, planning, humour, acceptance, religion, and self-blame. A recent work proposed a reduction to 4 dimensions: social support, problem solving, avoidance, and positive thinking (Baumstarck et al., 2017). Higher scores in these 4 dimensions reflect a higher tendency to implement the corresponding coping strategies.

2.3. Statistical analysis

Data were expressed in proportion or by mean and standard deviation. Correlations between depression, anxiety, coping strategies and EI scores were performed for patients and caregivers using Spearman's correlation test. To assess the dyadic effects of EI and coping strategies on depression and anxiety, the APIM with distinguishable dyads was assessed using structural equation modelling (Cook and Kenny, 2005). The APIM is useful to determine how parameters (EI, coping strategies, depression and anxiety) of each participant (namely patients and caregivers) are influenced not only by internal factors but also by factors related to the other member of the dyad. Structural equation modelling simultaneously examines both paths in the APIM: two actor effects (i.e., each person’s depression score regressed on their own EI profile) and two partner effects (i.e., each person’s depression score regressed on the other person’s coping strategies as on the other’s EI profile).

3. Results

3.1. Sample

One hundred and thirty-eight patients were eligible during the study period, 109 patients and their corresponding primary natural or family caregiver agreed to participate and meet the inclusion criteria. Finally, 79 patients and their corresponding caregiver were included in dyads analyses (because of 30 incomplete questionnaires). Participants (n = 79) and non-participants (n = 59) did not differ in gender, age, educational level and length of hospitalisation.

The mean Beck score was 15.4 (SD = 6.5) for the patients and 6.7 (SD = 6.3) for the caregivers. The mean STAI score was 59.6 (SD = 11.3) for the patients and 43.9 (SD = 11.7) for the caregivers. The mean TEIQue-SF score index was 121.2 (SD = 32.2) for patients and 11.3) for the patients and 43.9 (SD = 11.7) for the caregivers. The mean STAI-YA (SD = 6.3) for the caregivers. Concerning the coping strategies, patients used preferentially avoidance and social support strategies, caregivers implemented preferentially problem solving and positive thinking strategies. The characteristics of the included patients and their main caregivers are presented in Table 1.
sample characteristics of MDD patients and their caregivers.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Sample characteristics of MDD patients and their caregivers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Patients Caregivers</td>
</tr>
<tr>
<td>Men</td>
<td>M = 27 (34.2)</td>
</tr>
<tr>
<td>Age</td>
<td>M ± SD 41.6 ± 14.8</td>
</tr>
<tr>
<td>Marital status</td>
<td>Single 38 (50.7)</td>
</tr>
<tr>
<td></td>
<td>Couple 37 (49.3)</td>
</tr>
<tr>
<td>Educational level</td>
<td>Low (&lt; 12 years) 23 (29.1)</td>
</tr>
<tr>
<td></td>
<td>High (≥ 12 years) 56 (70.9)</td>
</tr>
<tr>
<td>Employment status</td>
<td>Without employment 64 (81.0)</td>
</tr>
<tr>
<td></td>
<td>With employment 15 (19.0)</td>
</tr>
<tr>
<td>Relationship between patient and caregiver</td>
<td>Partner 31 (39.2)</td>
</tr>
<tr>
<td>Beck</td>
<td>M ± SD 15.4 ± 6.5</td>
</tr>
<tr>
<td>STAI</td>
<td>M ± SD 59.6 ± 11.3</td>
</tr>
<tr>
<td>TEIQue-SF Index</td>
<td>M ± SD 121 ± 32.2</td>
</tr>
<tr>
<td>Coping strategies</td>
<td>Problem Solving 29.8 ± 22.6</td>
</tr>
<tr>
<td></td>
<td>Positive thinking 23.2 ± 17.7</td>
</tr>
<tr>
<td></td>
<td>Avoidance 37.8 ± 15.4</td>
</tr>
<tr>
<td>Social Support</td>
<td>M ± SD 41.3 ± 19.6</td>
</tr>
</tbody>
</table>

M ± SD: the mean ± standard deviation.

Beck (Beck Depression Inventory): higher scores indicate a higher severity of the depression.

STAI (State-Trait Anxiety Inventory): higher scores indicate higher anxiety.

TEIQue-SF (Trait Emotional Intelligence Questionnaire - Short Form): higher scores indicate higher trait EI.

3.2. Relationships between emotional intelligence, coping strategies, depression and anxiety

All the correlations between EI, coping strategies, depression and anxiety are reported in Table 2. The level of patients’ anxiety and depression was significantly lower when they had higher EI scores, and when they used problem solving and positive thinking strategies. When they were avoidant, they were more anxious and depressed. Patients’ anxiety and depression were not significantly associated with the caregivers’ EI and coping strategies.

In the same way as observed with patients, caregivers’ level of anxiety and depression was significantly lower when they had higher EI scores and when they used problem solving and positive thinking strategies. Caregivers were also more anxious and depressed when they were avoidant. Caregivers’ level of anxiety and depression were not significantly associated with the patients’ EI. Lower level of depression of caregivers was associated with the preferential use of problem solving strategies by the patients. We did not find this correlation about caregivers’ level of anxiety.

3.3. Results of the APIM on depression

The results of the APIM are presented in the Figs. 1 (EI and Beck) and 2 (Coping and Beck).

The caregivers’ EI was associated with a decrease of their own depression level contrary to patients for which the results were not significant. We did not identify any partner effect.

With coping strategies, we found several actor effects and one partner effect. The use of problem solving strategies by patients was associated with a decrease of their own depression level and of caregivers’ depression level. The use of positive thinking by patients and caregivers was associated with a decrease of their own depression level.

On the contrary the use of avoidance by patients and caregivers increases their own depression level. We did not find any actor or partner effect between social support strategies and patients’ or caregivers’ level of depression.

3.4. Results of the APIM on the anxiety level

The results of the actor partner interdependence model are presented in the Figs. 1 (EI and Beck) and 3 (Coping and STAI).

The patients’ and caregivers’ EI was associated with a decrease of their own anxiety level. We did not identify any partner effect.

With coping strategies, we found several actor effects and one partner effect. The use of avoidance strategies by caregivers increases their own anxiety and patients’ anxiety. As well as the results of depression level, the use of positive thinking and problem solving strategies by patients and caregivers was associated with a decrease of their own level of anxiety. We did not find any actor or partner effect between using social support strategies and patients or caregivers’ level of anxiety.

Table 2

Correlations between anxiety, depression, emotional intelligence and coping strategies for MDD patients and caregivers.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Correlations between anxiety, depression, emotional intelligence and coping strategies for MDD patients and caregivers.</th>
</tr>
</thead>
</table>
| Patients | Patients’ Beck − 0.418** | Caregivers’ Beck − 0.149
|         | Caregivers’ STAI − 0.446 | Caregivers’ STAI − 0.067
|         | Caregivers’ Beck − 0.149 | Caregivers’ STAI − 0.067
|         | Caregivers’ STAI − 0.067 | TEIQue-SF | BriefCope |
|         | Emotional intelligence | Social support | Problem solving | Avoidance | Positive thinking |
| Patients | − 0.418** | − 0.188 | − 0.325 | − 0.319 | − 0.428** |
| Caregivers | − 0.446 | − 0.093 | − 0.364 | − 0.307 | − 0.326** |
| Patients | − 0.149 | 0.022 | − 0.336 | 0.146 | − 0.188 |
| Caregivers | − 0.067 | 0.034 | − 0.134 | 0.081 | − 0.092 |

TEIQue-SF (Trait Emotional Intelligence Questionnaire - Short Form): higher scores indicate higher trait EI.

BriefCope (Brief Coping Orientation to Problems Experienced Scale): higher scores in these 4 dimensions reflect a higher tendency to implement the corresponding coping strategies.

Beck (Beck Depression Inventory): higher scores indicate a higher severity of the depression.

STAI (State-Trait Anxiety Inventory): higher scores indicate higher anxiety.

* p < 0.05.

** p < 0.01. Significant differences are in bold.
4. Discussion

The major results of this study may be summarized as follows: (i) caregivers experience both substantial depressive and anxious symptomatology; (ii) EI showed an actor effect on depression and anxiety level; and (iii) coping strategies showed actor and partner effects on anxiety and depression level within the dyad.

In line with previous studies on caregivers of patients with chronic illnesses (Jacobs et al., 2017; Liang et al., 2016), caregivers of MDD patients also experiment anxiety and depression symptoms. A STAI score higher than 39–40 suggests clinically significant symptoms for anxiety (Addolorato et al., 1999; Julian, 2011; Spielberger and Gorsuch, 1970) and a Beck score ranged from 4 to 7 suggests the presence of mild depression (Beck et al., 1988). To date, few studies have focused on exploring psychiatric symptoms such as depression and anxiety among caregivers of individuals with MDD, in contrast to other diseases such as schizophrenia (Gupta et al., 2015; Stanley et al., 2017), dementia (Ask et al., 2014; Martin et al., 2006) or cancer (Borges et al., 2017; Nijboer et al., 1999). The results of the European Federation of Associations of Families of People with Mental Illness (EUFAMI) international survey reported that having a family member with severe mental illness results in emotional, social, physical, financial and relationship burden (EUFAMI, 2014). This burden leads to caregivers’ psychological distress, defined as a state of emotional suffering characterized by symptoms of depression (e.g. loss of interest, sadness and hopelessness) and anxiety (e.g. restlessness, feeling tense) (Mirowsky and Ross, 2002). Although apparently less cumbersome to deal with than psychotic symptoms (Zendjidjian et al., 2012), our findings suggest that depressive and anxiety symptoms in MDD patients are particularly difficult to cope with for caregivers. In line with this hypothesis,
Liang et al. reported that the risk factors for caregiver’s anxiety and depression symptoms were increased when patients with cognitive impairment had higher level of depression (Liang et al., 2016). In the same way, anxiety and depressive symptoms are interrelated among dyads facing a newly diagnosed incurable disease (Jacobs et al., 2017). Our findings may support the systematic assessment of depression and anxiety symptoms in caregivers of patients with MDD. Taking into account depression and anxiety symptoms in caregivers is of importance both for the caregivers themselves and indirectly for patients’ health because caregivers’ health may affect their ability to care for the patients (Boyer et al., 2017; van Wijngaarden et al., 2004).

The actor effect between EI and symptoms confirms previous studies that reported that higher levels of EI were associated with various positive health outcomes (Austin et al., 2005; Boyer et al., 2017; Martins et al., 2010). For the caregivers, high levels of EI were moderately related to lower anxiety and depression level. Previous studies on caregivers reported that higher scores of EI were inversely associated with depression (Liang et al., 2016) and anxiety (Weaving et al., 2014). Although the mechanism by which EI influences these outcomes is not entirely understood, some studies have shown higher EI scores to be associated with significantly lower reactivity to stress at both psychological and biological levels (Mikolajczak et al., 2007b). EI seems to moderate the relationship between stress and mental health (Claro Rochi et al., 2002). In the same way, patients’ EI influences positively their level of anxiety in our study. The absence of statistically significant link between EI and level of depression is not in line with previous studies which reported that EI is reduced in depressive patients (Martins et al., 2010) and is a predictor of depression (Lloyd et al., 2012). However, we cannot exclude a lack of statistical power because the APIM approach preferentially requires a large sample size. From a therapeutic point of view, the question is to determine whether EI can be taught to patients and caregivers. This issue is not resolved, some conceptualizations suggesting that EI is a fixed quality difficult to change whereas other conceptualizations considering that EI is a dynamic ability amenable to change (Mayer et al., 2008b). Future studies should explore the therapeutic options to improve EI and explore the benefit on symptoms.

Finally, the coping strategies employed by the individuals have a moderate impact on their own anxiety and depression level (i.e. actor effect) but also on the other person of the dyad (i.e. partner effect). As expected (Baumstarck et al., 2017; Holahan and Moos, 1987), active coping strategies (i.e. problem solving and positive thinking) were associated with lower level of symptoms contrary to passive coping strategies (i.e. avoidance) which were associated with higher level of symptoms (Billings and Moos, 1984, 1981). These findings suggest that a systematic assessment of patient and caregiver coping styles could be conducted to identify individuals who do not use healthy coping strategies and to offer targeted psychological interventions (Iseselo et al., 2016; Kartalova-O’Doherty and Doherty, 2008). Problem-solving therapy interventions for patients and their caregivers have showed positive findings (Bell and D’Zurilla, 2009; Vázquez González et al., 2013). Some studies reported that psychoeducation programs, cognitive behavioural therapy and mindfulness helped patients and caregivers increase coping efficiency and improve their symptoms (Boele et al., 2013; Carlson, 2016; Keng and Tong, 2016). Dyadic interventions are subject of recent studies (Stahl et al., 2017), and need to be further developed.

4.1. Limitations and perspectives

The present study needs to be considered in the light of the following limitations.

First, the representativeness of the sample could be questioned, and may limit the generalization of the main findings: it is a relatively small sample, and all depressed patients were recruited in the same French teaching hospital, during the period of their hospitalisation. This does not allow to generalize our findings neither to global affective disorders nor to outpatient care. Moreover, only one primary caregiver, designated by the patient, was recruited. There could be variety in the types of coping associated with caregiving among different caregivers, due to different family roles and perceptions of caregiving (Kartalova-O’Doherty and Doherty, 2008; Priestley and McPherson, 2016). Further studies should not be restricted to the primary caregiver.

Secondly, we conducted a cross-sectional study that, contrarily to longitudinal study, cannot explore the influence of EI and coping strategies on depression and anxiety over time. This temporality link remains unknown. Future studies should focus on the longitudinal relationship between EI, coping strategies and symptomatology in patients and their caregivers.

Thirdly, an interesting data was not collected and should be included in future studies. The daily time spent between the caregiver and the patient has not been specifically assessed, and this data is known to influence caregivers’ burden.

Lastly, we chose to measure EI with a trait measure. Several conceptualizations coexist in the research literature including ability approach. Thus, future studies should explore ability EI in the context of MDD.

5. Conclusion

This study shows that EI and coping strategies are related to anxious and depressive symptoms of MDD patients and their caregivers. Moreover, certain coping strategies implemented by one member of the dyad influence directly the mental health of the other individual. These findings suggest that patients and their caregivers may be considered together as a system to fully address each individual’s psychiatric symptoms. Future research should discern when dyadic versus individual psychosocial interventions would be optimal in order to improve patients’ and caregivers’ mental health.

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