

Unmet needs and quality of life in multiple myeloma patients

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Abstract

This cross-sectional study analysed the contributors and moderators of quality of life. The sample comprised 124 Portuguese multiple myeloma patients assessed on social support, spirituality, unmet needs, psychological morbidity and quality-of-life measures. Results showed that being older and a woman, as well as psychological morbidity and unmet emotional needs were significant predictors of worse quality of life as measured by the QLQ-C30. Unmet financial needs moderated the relationship between psychological morbidity and quality of life. Results emphasize the importance of intervening in patients' unmet emotional needs and psychological morbidity in order to promote quality of life, in this population.

Keywords

morbidity, multiple myeloma, patients, quality of life, unmet needs

Introduction

Multiple myeloma (MM) is a type of cancer relatively uncommon (American Cancer Society (ACS), 2018). In the United States, between 2010 and 2014, there was an average annual incidence rate for MM of 6.5 per 100,000 individuals (ACS, 2017) and an average annual mortality rate of 3.3 per 100,000 between 2011 and 2015 (ACS, 2017). The 5-year survival rate of MM was 50 per cent between 2007 and 2013 in the United States (ACS, 2017). It was estimated that in 2018, 30,770 new cases of cancer will be of MM and 12,770 of the estimated cancer deaths will be from MM in the United States (Siegel et al., 2018). In Europe, in 2012, the age-standardized rate for the incidence of MM was 2.6 per 100,000 individuals and for the mortality from MM was 1.4 per 100,000 (Ferlay et al., 2013). Particularly

in the United Kingdom, the age-standardized rate for the incidence of MM was 3.5 per 100,000 individuals and for the mortality 1.8 per 100,000, while in Portugal the age-standardized rate for the incidence of MM was 2.3 per 100,000 and for the mortality 1.4 per 100,000 (Ferlay et al., 2013).

MM tends to affect older individuals with a mean age of 70 years (Mateos et al., 2015; Michels and Petersen, 2017) with only 15 per

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cent of patients being less than 65 years old (Michels and Petersen, 2017). MM is an incurable disease (Bolland et al., 2013) due to an anomaly of plasma cell neoplasms caused by the proliferation of a clonal B lymphocyte characterized by a replication of the malignant plasma cells (Dowling et al., 2016; Lamers et al., 2013; Osborne et al., 2012), producing more monoclonal protein (Michels and Petersen, 2017) due to genetic alterations (Maes and Delforge, 2015). These monoclonal proteins may be IgG, IgM, IgA, kappa or lambda light chain proteins. All of these types of myeloma cause hyperviscosity and organ damage (Michels and Petersen, 2017). MM alternates between stable and deteriorating phases (Ramsenthaler et al., 2016). Compared to other haematological cancers, MM patients have more severe health problems (Oberoi et al., 2017a), presenting with a specific symptomatology of lesions that includes bone destruction, anaemia, hyperkalemia and renal and bone marrow failure (Cocks et al., 2007; Dowling et al., 2016; Michels and Petersen, 2017; Ramsenthaler et al., 2016; Sherman et al., 2009). However, these symptoms may not be interpreted with the urgency they deserve, thus delaying diagnosis and treatment (Dowling et al., 2016).

Since MM is incurable, the goal of treatment is to control disease progression and to increase survival time and quality of life (QoL; Dowling et al., 2016). Treatment of MM has evolved and changed the prospect of survival due to the discovery of proteasome inhibitors and immunomodulatory drugs (Michels and Petersen, 2017) and an increased focus on early diagnosis and supportive care (Snowden et al., 2017). Currently, first-line MM treatments include an autologous (own cells) and allogeneic (donor cells) transplantation of stem cells, chemotherapy and treatments with new drugs such as morphine, thalidomide, lenalidomide and bortezomib (Mateos et al., 2015; Stephens et al., 2014).

Symptoms related to the disease, response to treatment and its toxicity impact mobility, independence and consequently social relationships (Snowden et al., 2017) and QoL (Baz et al., 2015; Maes and Delforge, 2015). Several

studies have found that social support positively influences the patient's QoL (Allart et al., 2013; Sirilla and Overcash, 2013) and may even be one of the greatest predictors of QoL in MM (Frick et al., 2006; Rini et al., 2016). In general, research indicates a consensual positive association between perceived support by family, friends and community and patients' QoL (Wang et al., 2015). The personal social relationships are also reported as a relevant aspect in MM patients' QoL (Dürner et al., 2013). High levels of perceived social support have been associated with a decrease in psychological morbidity (Rini et al., 2016), such as anxiety and depression and an increase in QoL (Molassiotis et al., 2011). In fact, social support is known for its buffer or moderator role against the effects of stress in chronic illness (Aro et al., 1989), as well as in the relationship between depressive symptoms and QoL in cancer patients (Huang and Hsu, 2013). Perceived social support influences the use of coping strategies, which can boost or reduce the impact of social support on emotional well-being (Lazarus, 1993).

Spirituality is an important resource against cancer (Prince et al., 2015). However, little attention has been given to spirituality in MM patients. Rippentrop et al. (2006) in their study showed an association between person's spiritual life and QoL using a sample of cancer patients. Since then, cross-sectional data had pointed to a positive linear relationship between these two aspects including the functional domains of the QoL (e.g. Al-Natour et al., 2017). Higher levels of spirituality not only are associated with better QoL (Barata et al., 2016; Bovero et al., 2015; Dürner et al., 2013; Slovacek et al., 2007), but also with a decrease in physical symptoms and lower anxiety and depression levels (Barata et al., 2016; Slovacek et al., 2007). Therefore, spirituality can be a predictor of QoL (Sirilla and Overcash, 2013). Studies have shown that spirituality beliefs may impact physical and mental health (Koenig, 2012), acting as a common coping mechanism that people use to cope with stressful life events, such as diagnosis and treatment of a life-limiting disease (Ellison

and Levin, 1998; Gall and Grant, 2005). This coping mechanism can provide a psychosocial adjustment after cancer diagnosis (Edser and May, 2007), helping to find meaning for their experience and a sense of control over the negative feelings triggered by cancer treatment and regarding the future (Koenig, 2002). However, there are few studies that emphasize the role of spirituality in the QoL of MM patients.

Few studies have focused on the unmet needs of patients with haematological cancers (Swash et al., 2017). In the cancer context, unmet needs refer to necessary, desirable or useful requests or resources that are not addressed, compromising the attainment of patients' optimal well-being (Foot, 1996; Harrison et al., 2009). In fact, cancer and its treatment may impact the most basic biological or physiological needs of patients (Ferrell and Hassey Dow, 1997; Sanson-Fisher et al., 2000). For this reason, the well-being of a cancer patient is determined by the response to their physical, social, psychological, emotional and spiritual needs (Ng et al., 2017), with implications on QoL (Edib et al., 2016; Zalenski and Raspa, 2006). These needs are reflected in the hierarchical model of Maslow's needs, a motivational theory in psychology (Maslow and Frager, 1987), which was also adapted by Zalenski and Raspa (2006) to the health context. According to this model, the most basic needs, expressed in the lower layers, must be met before the higher needs (Maslow, 1993; Maslow and Frager, 1987). However, in the oncological context, all needs are evaluated and managed concomitantly (Ng et al., 2017), since cancer patients can often move forward and/or back in the hierarchy of needs depending on the trajectory of cancer disease, according to the physical, emotional, social and spiritual challenges involved (Schapmire and Faul, 2015). In this sense, assessment and subsequent response to the unmet needs of cancer patients can provide a sense of control over the disease, and thus emotional and physical well-being, with implications on QoL (DeRouen et al., 2015). Therefore, it is important to analyse and understand the moderating role of unmet needs in the

QoL of patients with MM in order to develop programmes that satisfy the unmet needs of this population, with the ultimate goal of promoting a better QoL.

Another important aspect is the perspective of unmet needs over time (Stephens et al., 2014), which may vary depending on the stage of disease trajectory (Swash et al., 2017). However, there are few studies that focus on the unmet needs of MM patients over the course of the disease (Swash et al., 2017). A systematic review study showed that patients with haematological cancer present different needs that are not met due to the trajectory of the disease: at the treatment moment, the main needs focused on the fear of recurrence and psychological and practical needs; at the end of treatment, the main unmet concern was the fear of recurrence; and in follow-up, unmet needs focused primarily on issues related to fertility and sexual functioning (Swash et al., 2017). A longitudinal study with patients with MM and diffuse large B-cell lymphoma showed that anxiety, depression, and unmet needs of the patient during treatment were associated with decreased physical and emotional well-being in the months following diagnosis (Oberoi et al., 2017c). One in three patients reported psychological, emotional, daily and physical life needs; and one in four patients reported informational needs (Oberoi et al., 2017c). Therefore, unmet needs that manifest after diagnosis and treatment may persist in the initial survival period and contribute to psychological distress (Oberoi et al., 2017b).

The patient's emotional, psychological and physical conditions play an essential role in QoL (Rueda-Lara and Lopez-Patton, 2014) and are related with psychological morbidity, in MM patients (Noorani and Montagnini, 2007). Barata et al. (2018) found an association between symptoms related to haematopoietic cell transplant and depressive symptoms in MM patients, regardless of gender and age. Moreover, when compared to other types of cancer, MM patients experience higher levels of psychological morbidity (27%–48%; Boyes et al., 2015). In a study with 1414 patients,

one-quarter of patients with haematological cancers had elevated levels of anxiety and depression (Hall et al., 2016). In the Sherman's et al. (2009) study, one-third of the sample presented depression and anxiety.

The reports of the experiences of people living with myeloma and a description of their unmet needs are limited in the published literature (Hall et al., 2013; Hauksdóttir et al., 2017; Osborne et al., 2014; Swash et al., 2017) along with studies focusing on haematological cancers. Considering that (1) MM is an incurable disease with an unpredictable trajectory of remission, relapse and refractory disease (Stephens et al., 2014; Vlossak and Fitch, 2008); (2) many patients still do not express voluntarily their concerns/needs to oncologists and nurses (Chiesi et al., 2017) and (3) little is known about the supportive care needs of patients receiving active treatment and those with advanced and progressive disease (Molassiotis et al., 2011), this study focuses on unmet needs and their role on QoL, since responding to these needs may be a promising strategy to improve the QoL of patients with MM, as well as to inform future interventions in this area. Specifically, the aims of this study were (1) to analyse the relationships among sociodemographic (gender and age), clinical (MM stage and duration of diagnosis), disease impact and treatment (symptoms, side effects and future perspective) and psychological variables (psychological morbidity, unmet needs, social support and spirituality) with overall QoL; (2) to assess the contribution of all variables to patients' QoL; and (3) to analyse the moderator role of unmet needs (information, financial, emotional and health care access) in the relationship between psychological distress and overall QoL.

Methods

Participants

This study used a cross-sectional design and a convenience sample of 124 patients with MM, who were being followed at three major public hospitals in Portugal. The inclusion criteria

were (1) diagnosis of MM, (2) being under treatment, (3) being literate, (4) being >18 years old and (5) having no cognitive deficit as assessed by the Mini Mental State Exam. In order to assess stage disease, the ISS system was used: I, II and III (Martinez, 2007): Stage I: $\beta 2 M < 3.5 \text{ mg/L}$ and albumin $\geq 3.5 \text{ g/dL}$; Stage II: $\beta 2 M < 3.5 \text{ mg/L}$ and albumin $< 3.5 \text{ g/dL}$ or $\beta 2 M$ between 3.5 and 5.5 mg/L; and Stage III: $\beta 2 M \geq 5.5 \text{ mg/L}$.

Measures

Sociodemographic and clinical characteristics. Participants were asked to answer a sociodemographic and clinical questionnaire that evaluated sociodemographic (gender, age, schooling, marital status, professional status, caregiver and religious belief) and clinical characteristics (type of illness, duration of diagnosis, stage of disease, treatments performed, presence of other diseases and access to health care).

Quality of Life. The European Organization for Research and Treatment of Cancer's (EORTC) Questionnaire C30 (Aaronson et al., 1993; Portuguese Version by Pais-Ribeiro et al., 2008) evaluates the patient's perception of QoL with 30 items. The questionnaire includes a total score and several functional subscales – physical (e.g. 'Do you have any trouble taking a short walk outside of the house?'), role (e.g. 'Were you limited in doing either your work or other daily activities?'), emotional (e.g. 'Did you worry?'), social (e.g. 'Has your physical condition or medical treatment interfered with your family life?') and cognitive (e.g. 'Have you had difficulty in concentrating on things, like reading a newspaper or watching television?') and symptoms subscales – fatigue (e.g. Did you need to rest?), pain (e.g. Have you had pain?), nausea and vomiting (e.g. 'Have you felt nauseated?'), as well as the global health status (e.g. 'How would you rate your overall health during the past week?'). Participants answer on a 4-point Likert scale where 1 corresponds to 'not at all' and 4 to 'very much'. High scores on the functional scales and the overall health scale

indicate better functioning and high levels of QoL, whereas high scores on the symptoms scale indicate a high number of symptoms.

The EORTC Multiple Myeloma Module (QLQ-MY20; Cocks et al., 2007; Research Version of Pereira and Ferreira, 2016b) with 20 items specific for MM patients was used to assess the impact of the disease and treatment – Disease Symptoms (e.g. ‘Have you had bone aches or pain?’), Body Image (e.g. ‘Have you felt physically less attractive as a result of your disease or treatment?’), Side Effects of Treatment (e.g. ‘Did you feel drowsy?’) and Future Perspective (e.g. ‘Have you been thinking about your illness?’) on a 4-point Likert scale where 1 indicates ‘not at all’ and 4 ‘very much’. It has no overall value, but high scores on the symptoms scales reflect a greater number of symptoms. Regarding future perspective and body image, since the items are inverted scored, high scores indicate worse future prospects and body image.

Satisfaction with Social Support. The Satisfaction with Social Support Scale (ESSS; Pais-Ribeiro, 1999) evaluates satisfaction with social support with 15 items grouped into four subscales: Satisfaction with Friends, Intimacy, Family Satisfaction and Social Activity. Items are rated on a 5-point Likert scale where 1 corresponds to ‘Totally Agree’ and 5 to ‘Totally Disagree’. High scores indicate greater satisfaction with social support. The instrument provides a total score.

Spirituality. The Spiritual and Religious Attitudes in Dealing with Illness (SpREUK; Büssing, 2010; Portuguese version by Pereira et al., 2015) includes 15 items grouped into three subscales: Search (for Support/Access), Trust (in Higher Guidance/Source) and Reflection (Positive Interpretation of Disease) rated on a 5-point Likert scale where 0 is ‘Not at all’ and 4 ‘Very much’. The higher the global score, the greater the importance given to spirituality.

Unmet needs. The Short-Form Survivor Unmet Needs Survey (SF-SUNS; Campbell et al., 2014; Portuguese Research version by Pereira

and Ferreira, 2016a) includes 30 items grouped into four subscales that assess the following: Information Regarding the Disease (e.g. ‘Finding information about complementary or alternative therapies’), Financial Concerns (e.g. ‘Worry about earning money’), Access and Continuity of Care (e.g. ‘Having access to cancer services close to my home’) and Emotional Health (e.g. ‘Telling others how I was feeling emotionally’). Participants are asked to answer by recalling the previous month, using a 5-point Likert scale where 0 corresponds to ‘no unmet need’ and 4 to ‘very high unmet need’. There is no total score, so the higher the score in each subscale, the greater the number of unmet needs, in that particular domain.

Psychological morbidity (anxiety and depression). The Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983; Portuguese version by Pais-Ribeiro et al., 2007) includes 14 items grouped into anxiety and depression subscales rated on a 4-point Likert scale (ranging from 0 to 3) with the sum of both subscales indicating psychological distress. High scores indicate greater psychological distress.

Procedure

The study was approved by the Ethics Committees of three major public hospitals in the North of Portugal (Ref. number CESHB 071/2016, Ref. number 2016.133 (114-DEFI/110-CES) and Ref. number 13390/2016). Physicians identified patients who met the inclusion criteria and provided its identification and clinical data to the researcher. Patients were invited to participate by their physician and signed an informed consent form. Data collection took place on the day of medical appointment or treatment in an available room of the hospital unit. It is important to note that before answering the instruments, the Mini Mental State Examination was administered in order to assess the cognitive abilities of patients above 65 years. Participation was voluntary and patient confidentiality was assured.

Statistical analysis

In order to analyse the relationship among clinical variables (myeloma stage and duration of diagnosis), sociodemographic variables (gender and age), unmet needs (emotional, financial, information and access to medical care), disease impact and treatment (symptoms, side effects and future perspective), psychological morbidity, social support and spirituality with total QoL, the Pearson correlation was performed. To find the contribution of psychological variables to QoL, controlling for sociodemographic variables, a hierarchical linear regression was used. The variables that correlated with QoL (enter method) were introduced. The presence of multicollinearity was tested with acceptable VIF (was <4 and tolerance values (was >.1). In block 1, the variables gender and age were introduced, and in block 2, the psychological variables: social support, psychological morbidity, unmet informational needs and unmet emotional needs were introduced. Moderation was tested using the macro process command for SPSS with bootstrapping (version 2.16.1; Hayes, 2013).

Statistical analyses were performed using the SPSS statistical software (IBM SPSS Statistics version 22.0).

Results

Sample characterization

The sample consisted of 124 MM patients. The sociodemographic and clinical characterizations of the sample are presented in Table 1.

In terms of unmet needs, the weighted mean for informational unmet needs was 1.43, for both financial and emotional needs was 1.14, and for access to medical care was .42. From the total sample, 99.2 per cent reported at least one emotional unmet need, 91.9 per cent one financial unmet need, 78.2 per cent an informational unmet need and 62.1 per cent an access to medical care unmet need. In particular, the most reported unmet needs (moderate to very high level) were 'dealing with feeling tired' (66.9%),

'finding car parking that I can afford at the hospital or clinic' (58.0%) and 'doing work around the house (cooking, cleaning, home repairs, etc.)' (52.4%) and 'finding information about complementary or alternative therapies' (51.6%). Regarding the impact of the disease and treatment, the most reported symptoms were 'concern about the state of health in the future' (78.2%), 'thinking about the disease' (72.6%), 'concern about the possibility of dying' (67.7%), 'tingling in hands and feet' (66.1%), 'back pain' (64.5%) and 'dry mouth' (63.7%).

Relationships among clinical, sociodemographic, psychological variables, and QoL

Results showed a significant correlation between QoL (QLQ-C30) and gender ($r = -.283, p = .001$) and age ($r = -.293, p < .001$). Being female and older was associated with worse QoL. Results also revealed negative correlations between QoL and information unmet needs ($r = -.227, p = .011$), emotional unmet needs ($r = -.594, p < .001$) and psychological morbidity ($r = -.596, p < .001$). QoL was also positively correlated with social support ($r = .410, p < .001$).

Regarding the impact of the disease and treatment assessed by the QLQ-MY20, future perspectives were positively associated with emotional unmet needs ($r = .391, p < .001$) and psychological morbidity ($r = .447, p < .001$). Disease symptoms (QLQ-MY20) were positively associated with information unmet needs ($r = .225, p = .012$), financial unmet needs ($r = .200, p = .026$), emotional unmet needs ($r = .316, p < .001$), access to medical care needs ($r = .237, p = .008$), psychological morbidity ($r = .317, p < .001$) and spirituality ($r = .216, p = .016$). Treatment side effects (QLQ-MY20) were positively associated with emotional unmet needs ($r = .294, p < .001$) and psychological morbidity ($r = .365, p < .001$). Treatment side effects and future perspectives were negatively correlated with social support ($r = -.288, p = .001$; $r = -.221, p = .015$, respectively).

Table 1. Descriptive statistics for sociodemographic and clinical variables (N = 124).

Continuous measure	Minimum	Maximum	Mean	SD
Age (years)	38	87	67.70	10.73
Duration of diagnosis (in months)	1	120	37.50	30.28
Categorical measure				%
Gender				
Female				51.6
Male				48.4
Education level				
Illiterate				7.3
Primary school				52.4
Secondary school till higher education				39.4
Professional degree				0.8
Employment status				
Employed				9.7
Unemployed				9.7
Retired				79.8
Marital status				
Single				5.6
Married/union of fact				77.4
Divorced				3.2
Widower				13.7
Have help with their needs				
No				41.9
Yes				58.1
Myeloma type				
IgG/K				38.4
IgA/K				23.2
IgG/L				15.2
IgA/L				11.1
Other types				12.1
Myeloma stage				
Stage I				39.6
Stage II				34.4
Stage III				26.0
Previous treatments				
Chemotherapy				37.5
Chemotherapy + transplantation of				
Haematopoietic cells				30.8
Another type of treatment				31.7
Current treatment				
Chemotherapy				43.8
Maintenance therapy				48.8
Another type of treatment				7.5

SD: standard deviation;

Table 2. Variables contributing to patient's QoL (final model).

Total QoL						
Variables	R ² (Adjusted R ²)	F	β	t	p	f ²
<i>Block 1</i>	.138 (.123)	9.520			.000	
Gender			-.235	-2.672	.009**	
Age			-.236	-2.687	.008**	
<i>Block 2</i>	.467 (.439)	16.769			.000	.876
Gender			-.114	-1.567	.120	
Age			-.050	-.678	.499	
Unmet information needs			.007	.091	.928	
Unmet emotional needs			-.338	-3.368	.001**	
Social support			.099	1.215	.227	
Psychological morbidity			-.297	-3.144	.002**	

* $p < .05$; ** $p < .01$; *** $p < .001$.

Contribution of sociodemographic and psychological variables to patients' QoL

The multiple regression analysis showed that in the first block, sociodemographic variables explained 13.8 per cent of the QoL variance, where gender and age appeared as significant predictors. In the second block, only the psychological morbidity and number of unmet relationship and emotional needs emerged as significant psychological predictors, accounting for an additional 32.9 per cent of the variance. The final regression model explained 46.7 per cent of the total QoL variance and showed that higher psychological morbidity and higher number of unmet relationship and emotional needs were associated with worse total QoL as measured by the QLQ-C30 (see Table 2).

Unmet needs as moderators in the relationship between psychological morbidity and QoL

Results showed that unmet financial needs were moderators between psychological morbidity and total QoL, measured by the QLQ-C30 ($\beta = -.690$, 95% confidence interval (CI) = -1.270 to $-.111$, $t = -2.3583$, $p = .020$). Specifically, there was a negative relationship between

psychological morbidity and QoL when unmet financial needs were higher ($\beta = -22.422$, 95% CI = -27.910 to -16.934 , $t = -8.090$, $p = .000$) and lower ($\beta = -14.147$, 95% CI = -18.862 to -9.432 , $t = -5.941$, $p = .000$), but stronger when they were higher (Figure 1).

The remaining unmet needs (information, emotional and health care access needs) did not moderate the relationship between psychological morbidity and QLQ-C30.

Discussion

In this study, the mean age of patients with MM was approximately 68 years, which is corroborated by previous studies in which the mean age ranges from 65 (Rajkumar, 2016) to 70 years (Mateos et al., 2015; Michels and Petersen, 2017).

Regarding unmet needs, the results are in agreement with the study by Harrison et al. (2009) where information, financial and psychological needs were more reported, as in the study of Swash et al. (2017) in which psychological needs were more commonly reported. Corroborating the present results, Bolland et al. (2013) found the symptoms resulting from the disease, such as fatigue together with the difficulty of parking the car in the hospital, and the need for more information and health care

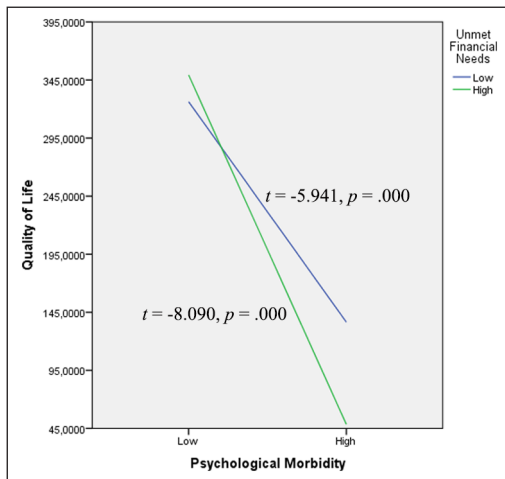


Figure 1. Unmet financial needs as a moderator between psychological distress and QoL.

(Molassiotis et al., 2011). Also, practical needs have been suggested as important for MM patients at the time of treatment (Swash et al., 2017). Indeed, these findings make intuitive sense because patients, when confronted with a disease of unpredictable course, need to gain control, treating symptoms as a way to minimize suffering (Nayak et al., 2015; Vallerand et al., 2007). Indeed, the desire to get primary control is a basic human need, which is shaken by the diagnosis of cancer (Thompson et al., 1993). This aspect is even more relevant if taking into account that the perceived control over the disease tends to decrease with age (Kempen et al., 2005; Ruthig et al., 2008). In this sense, knowing how to control the consequences of illness (symptoms) as a way to avoid suffering is crucial (Morling and Evered, 2006). In fact, the symptoms most reported by MM patients were concern about future health, the possibility of dying, back pain and tingling in the hands and feet, emphasizing the reason to underscore psychological needs.

Being a woman was associated with a poorer QoL probably due to the gender role, which socially requires women to be in charge of the home and children. When faced with difficulties in following these expectations, women may evaluate their health condition as limiting,

causing more frustration that may impact their QoL (Molica, 2006). It may be also associated with pain perception (Paller et al., 2009) and the increased risk of depression in women (Kessler et al., 2005), which according to the literature are significant predictors of QoL, in female patients with cancer (Pud, 2011). However, we have to interpret these data with caution, since there is some evidence that male patients are less likely to admit problems than women (Arden-Close et al., 2011).

Being older was associated with worse overall QoL as expected (Van der Poel et al., 2015) as well as social support. Studies reported that social support is associated with better QoL and less psychological morbidity (Allart et al., 2013; Sirilla and Overcash, 2013). Greater number of unmet informational and emotional needs was also associated with worse QoL, which is corroborated by the literature (Barata et al., 2016; Edib et al., 2016; Lamers et al., 2013; Ng et al., 2017; Zalenski and Raspa, 2006).

Future perspectives were negatively correlated with social support. Social support takes on an important role as stress buffer, with family support and social relationships contributing to higher levels of QoL (Molassiotis et al., 1997); however, the particular domain of future perspectives could be negatively affected by social support once the thought of imminent death may worry patients with the future loss of their loved ones, their source of social support.

In terms of unmet needs, this study showed that informational, financial, emotional and access to medical care needs were associated with symptoms of the disease, which again is in agreement with the literature, which shows that symptoms of the disease were the best predictors of unmet needs, in patients with MM (Molassiotis et al., 2011). More emotional needs and psychological morbidity have been associated with worse future prospects, which is understandable, given that depression is negatively associated with future prospects (Jordan et al., 2014).

Disease symptoms were positively associated with psychological morbidity and spirituality. These results are in concordance with Kenzik

et al. (2015) who found that depressive symptoms mediated the relationship between physical symptoms and mental QoL, suggesting that psychological morbidity played a main role on disease symptoms. Spirituality can be a coping resource with stressful life events explaining why patients with more symptoms may use spirituality as a coping mechanism (Gall and Grant, 2005).

Treatment side effects were positively associated with emotional unmet needs and psychological morbidity and negatively correlated with social support. Cancer patients with higher levels of anxiety and depression present more problematic treatment side effects and reported greater emotional unmet needs (Watson et al., 2016). When social support is perceived as low, patients have worse QoL, namely, on physical and functional domains influenced by treatment side effects (Rini et al., 2016).

Psychological morbidity and unmet emotional needs were the best contributors to poorer QoL. These results are in accordance with Allart et al. (2013), who found high levels of anxiety and depression associated with poorer QoL; and depression associated with a higher number of unmet emotional needs and worse QoL (Barata et al., 2016; Lamers et al., 2013). People with higher levels of psychological morbidity present a more negative outlook toward the future and hopelessness (Cassileth et al., 1985; Cella and Tross, 1986; Pasquini and Biondi, 2007) and amplification of the reported symptoms (Goncalves et al., 2008), which may result in a negative evaluation of their QoL.

Unmet financial needs moderated the negative relationship between psychological morbidity and QoL, and the relationship was stronger when they were higher. This result is corroborated in the literature, in that low economic income was associated with higher distress and worse QoL (Molassiotis et al., 2011). In this study, only financial needs were moderators, probably due to the economic difficulties derived from the low pensions received by the participants. In the Portugal context, only direct expenditures with the disease are financed (Araújo et al., 2009). Indeed, the effects of cancer and its treatment can disrupt activities in

which individuals normally engage. In addition, MM implies a significant increase in health costs, with medications for other co-morbidities, which translate into a financial burden for patients and the family (Cömert et al., 2013) that may be beneath patient's ability to pay, causing economic overload (Yabroff et al., 2011). Therefore, when faced with expenses they cannot meet, unmet financial needs increase (Page and Adler, 2008) and this economic overload may lead to greater psychological distress, with implications on patients' QoL (Fenn et al., 2014). Future studies should test this hypothesis with bigger samples.

This study has some limitations, such as the sample size, the cross-sectional design and the exclusive use of self-report measures. Having a modest sample influences the interpretation of the data and results. Therefore, a cautious interpretation of the results is required. Future studies in patients with MM regarding unmet needs and QoL should be longitudinal in order to analyse differences at each stage of treatment as well as the mediating role of unmet needs in the relationship between clinical variables and QoL.

Conclusion

In this study, being older, a woman together with psychological morbidity and number of unmet emotional needs emerged as significant predictors of worse QoL as measured by the QLQ-C30. Unmet financial needs moderated the relationship between psychological morbidity and QoL. According to the results, it would be important in patients with MM to intervene on unmet financial needs and this goal requires social and community policies to help patients financially. Also, given the reported mobility difficulties in these patients, social policies should also consider parking spaces for access to health care services for MM patients. Given the report of unmet emotional needs of MM patients and high levels of psychological morbidity, it would also be paramount to include, in the multidisciplinary treatment team, a health psychologist to help patients manage psychological distress in order to promote QoL.

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