

## ORIGINAL ARTICLE

# A study of a couple with type 2 diabetes: dyadic adjustment and psychological morbidity

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## SUMMARY

**Objective:** this study assessed dyadic adjustment and psychological morbidity in type 2 diabetic patients and their partners, focusing on the role of gender.

**Methods:** 214 diabetic patients and their partners participated in the cross-sectional study and were assessed on psychological morbidity (HADS) and marital adjustment (RDAS). Data was analyzed using dyadic analysis, a statistical process that studies the patient/partner dyads simultaneously.

**Results:** results revealed that the negative relationship between dyadic adjustment and psychological morbidity in female patients was stronger than in male diabetic patients or in partners of male diabetic patients. On the other hand, the relationship between dyadic adjustment and psychological morbidity in partners of diabetic men was stronger than the same relationship in partners of diabetic women.

**Conclusion:** since gender is a moderator, it is important to attend to the different needs of female and male patients and the education of diabetic patients should be centered on the patient/partner dyad.

**Keywords:** *diabetes mellitus*, morbidity, marriage, gender identity, health care delivery, cross-sectional studies.

Study conducted at various Health Center Groupings in the North of Portugal

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## INTRODUCTION

*Diabetes mellitus* is a chronic disease that has been increasing considerably, especially in developed and developing countries. In Portugal, the prevalence of diabetes in 2009 was 11.7%, indicated by the existence of 905,035 Portuguese people between 20 and 79 with the disease.<sup>1</sup>

The need for self-control by diabetic patients has significant implications on their lifestyle, and may affect them at a psychological level.<sup>2</sup> Psychological morbidity has deserved special attention by investigators, as some studies have demonstrated that diabetes is associated with more anxiety and depression in comparison with the non-diabetic population.<sup>3</sup> Indeed, depression has arisen as one of the most prevalent psychological disturbances, and is estimated to occur in 15 to 20% of diabetics.<sup>4</sup> This psychological morbidity may be due to the change in lifestyle required to keep diabetes controlled, evoking symptoms of anxiety and depression. The influence of some social and demographic characteristics has also

been analyzed and the results indicate the existence of more mood disorders in diabetic women, where it seems to be consensual that such patients present more anxiety and depression when compared to diabetic men.<sup>5,6</sup> In another study,<sup>7</sup> it was verified that women with type 2 diabetes (31.7%) showed a higher rate of depressive symptoms than that found in men (22.2%) and a rate of anxiety symptoms three times higher than men.<sup>6</sup>

In fact, women seem to be more disposed to changes in mood. Many studies suggest that the multiple roles performed by women in society may overload them, exposing them to greater vulnerability, especially in countries where there are inequalities in terms of gender. Simultaneously, the social role attributed to women, associating them with greater emotional fragility and dependency, may contribute to these results, as the expression of feelings is facilitated more in women than in men.<sup>5,6</sup>

Dyadic adjustment may also be a facilitating or complicating factor in changes to the lifestyle of diabetics.<sup>8</sup> The

importance that the marital relationship assumes in the management of diabetes has been gaining greater prominence in the scientific community.<sup>9</sup> A number of authors<sup>8-10</sup> reiterates the influence of the marital relationship on self-care, highlighting it as important for successful adaptation. Dyadic adjustment is a vague concept which in order to be better understood implies considering the manner in which the marital relationship exercises and impact and affects self-care in diabetes. In fact, studies suggest that good levels of cohesion, organization and communication between the couple are associated with greater adherence to the therapeutic regime.<sup>11</sup> These findings are equally corroborated by various authors, who warn of the importance of the marital relationship in adherence to the treatment regime in diabetes, and how it may contribute to or impede self-care behavior.<sup>7,9</sup> Diabetic patients that report greater satisfaction in their marital relationship describe better adaptation to the disease and treatment, experience less stress and report better quality of life and wellbeing.<sup>8,12-14</sup> The partner's support is determinant in dealing with and managing a chronic disease, especially positive support (praising, encouraging, reminding) to the detriment of negative support (criticizing, pressurizing). The support provided by the partner can exercise an important impact on adherence to the diet. In fact, the partner performs a formal role in purchase of ingredients, the preparation and cooking of foods and meals, and reminding the diabetic to eat various times throughout the day.<sup>8,14,15,17,18</sup> In a qualitative study by Trief et al.<sup>17</sup> with couples where one partner had diabetes, it was verified that female partners made an effort to adjust times and locations of meals, reminded their partner to take their medication and measure blood glucose levels, and that these behaviors were perceived as beneficial by the patient. Inevitably, diabetes, as a chronic disease, generates stress and tension, requiring an adaptation by the partner and a process of collaboration and mutual help by the couple.<sup>15,19</sup> Thus, dyadic adjustment affects adherence to self-care in diabetes, not only through positive reinforcement behaviors but also how they deal with the diseases, individually and as a couple.<sup>20</sup> While some partners react more actively and together with the patient to decide on which decision to take and what strategies to adopt to deal with the disease, others perform a more passive and less proactive role.<sup>20,21</sup> In fact, the last author stated that talking about and discussing problems inherent in the management of diabetes is beneficial to patients. In another perspective, the patient and partner's perception of good dyadic adjustment increases the sense of identity and is a source of self-esteem and company to share activities, which in turn reduces psychological morbidity and increases satisfaction with life.

Although studies focus a lot on the diabetic and the role of the partner in the marital relationship, the truth is that this relationship is bidirectional, as the way the diabetic adjusts and manages their health affects their partner, and vice versa. The influence of the marital relationship on psychological morbidity may affect the diabetic's adherence and it is therefore important for health professionals to understand how gender may affect this relationship directly and indirectly metabolic control.<sup>8</sup> Thus, it is important to evaluate the influence of dyadic adjustment on psychological morbidity, taking into consideration the effect of male diabetics on female partners and the effects of female diabetics on male partners, using the dyad as an analysis unit. Women have ways of dealing with the disease differently from men, which will affect how they dealt with diabetes as patients and partners. Given the multiple roles that women perform in society it is important to reflect on how they deal with chronic diseases. Women are the main carers of children, partners and parents, so it is therefore a challenge to adapt to a chronic disease.

As we intend to study the interpersonal and intrapersonal relationships between patients and partners, the fundamental unit for analysis should be the dyad. Dyadic analysis provides a methodological and analytical approximation for the study of dyads, as it takes into account the true interpersonal nature of phenomenon under study, with a focus on relationships and not individuals. The intrinsic dyadic nature of many measurements shows that they are frequently connected to other measurements in the study, and the strength of these connections may be one of the most important investigational issues to be examined. Broadly speaking, dyadic measurements reflect the contribution of two people, although these contributions may be very different.<sup>12</sup>

The dyadic study of patients and partners requires statistical precautions owing to the non-independent potential of the data from patients and partners. Thus, the actor-partner interdependence model (APIM)<sup>22</sup> was used to explore the associations between the marital relationship and psychological morbidity in the patient-partner dyad, taking gender into consideration. The model conceptualizes two effects: intrapersonal and interpersonal with statistical techniques for simultaneously estimating these effects. The model was used in various studies that evaluate the relationship between patients and partners in chronic diseases such as diabetes,<sup>23</sup> cancer,<sup>24</sup> and more.

In this study, the hypotheses are based on the presupposition that the marital relationship of the diabetic influences their psychological morbidity (actor effect) and the psychological morbidity of partners (partner effect).

This study had the objective of understanding the relationship between dyadic adjustment and psychological morbidity in male and female diabetic patients, studying the moderator role of gender in the relationship between the two variables.

## METHODS

214 diabetics and their partners participated in the study and were evaluated for a period of one year after diagnosis with type 2 diabetes by a family physician at a routine nursing consultation at their health center. The data collection period lasted for two years and took the form of a cross-sectional study.

The sample was collected at health centers in the North of Portugal, after approval of the research projects by the Ethics Commission of the Regional Health Administration and the directors of the health centers. The health professionals that accepted collaborating identified the recently diagnosed diabetics, signed an informed consent statement and completed a form with the clinical data of the patients. All of the patients knew the objective of the study and signed statements of informed consent. The patients and partners completed the questionnaires after a routine nursing consultation.

The inclusion criteria for the diabetic patients was: having been diagnosed with diabetes for no more than a year at the time of the evaluation, having a partner, and being over eighteen years old. The exclusion criterion was having an oncologic disease.

The data collection instruments included the Revised Dyadic Adjustment Scale (RDAS)<sup>25</sup>. This scale is constituted by fourteen items that include three sub-scales: dyadic adjustment, dyadic satisfaction and dyadic cohesion. High results correspond to greater dyadic adjustment. The alpha in the original version on the full scale was 0.7 and in the present sample was 0.75 in diabetics, as well as in the sample of partners, an indicator of an acceptable fidelity.<sup>26</sup>

The Hospital Anxiety and Depression Scale (HADS).<sup>27</sup> This scale evaluates psychological morbidity (depression and anxiety) on a scale of fourteen items. Higher scores indicate higher levels of anxiety and depression, respectively. In the original version the Cronbach's alpha was 0.89 in women and 0.9 in men. In this study's sample, the alpha found for the full scale was 0.85 in diabetics and 0.87 in partners, an indicator of good fidelity.<sup>26</sup>

In the statistical analysis for characterization of the sample, the paired Student's *t*-test was used to examine the difference in the means between male patients and their female partners and female patients and their male

partners (dyad comparison) and the Student's *t*-test for independent samples to examine the differences between male and female patients.

Given that the objective of this study was to test the moderator role of gender on the relationship between dyad adjustment and psychological morbidity, structural models were utilized. Therefore, the analyses were undertaken using IBM SPSS AMOS 19 and maximum likelihood estimates. The viability of all the structural models tested was assessed using various adjustment indexes beyond  $\chi^2$ , namely comparative fit index, CFI, and the root-mean-square error of approximation, RMSEA. Reference values of 0.9 or above were used as indicating a good adjustment for the CFI, and values equal to or lower than 0.05 were used as indicators of good adjustment for the RMSEA.<sup>28</sup>

In accordance with the expectation for gender differences in the connections between dyadic adjustment and psychological morbidity, multiple group models were used, comparing the actor and partner effects of dyadic adjustment (RDAS) and psychological morbidity (HADS) to male patients and their female partners ( $n = 199$  dyads) and female patients and their male partners ( $n = 133$  dyads). Each model represents a pair of correlated regressions corresponding to the APIM structure. Based on previous work with similar models, and considering the number of variables (two) taking the Tabachnik and Fidell<sup>29</sup> formula as a basis for calculating the regressions, the present sample would fully satisfy the criterion for testing the hypothesis of the actor and partner effects of the relationship between dyadic adjustment and psychological morbidity in the two groups.<sup>22</sup>

The dyadic analyses were conducted in two stages.<sup>22</sup> First, the actor and partner effects were examined within each group to identify the best adjustment and the most parsimonious model for each group. Initially the two connections representing the actor effects and the two connections representing the partner effects were constrained to be equality in order to evaluate the respective similarity within each group. Next, alternative pairs of connections were released systematically to be estimated and compared with the adjustment of the model with the constraints applied, and subsequently removed.  $\chi^2$  difference tests were used to compare the models, where the significance decreases in  $\chi^2$  (relating to the base model), indicating a better adjustment of the model when equality constraints are removed.

In the second stage, the equality of the actor and partner connections between the two groups was examined (e.g. the actor effect for male patients was compared with

the actor effect of the female patients). The starting model was that presenting the best adjustment for each group, identified in the first stage and, alternatively, the actor connections and partner connections were constricted to equality between the two groups.  $\chi^2$  difference tests were used for comparing the models, in order to determine if the adjustment to the model deteriorated when the equality constraints are imposed on specific connections. The actor and partner connections that were not equivalent between the groups reflect the gender differences in the associations between dyadic adjustment and psychological morbidity of patients and partners.

## RESULTS

### Characteristics of the sample

In the present sample (n = 214), male patients were, on average, older than their partners (t (199) = 2.69; p < 0.001) and female patients were younger than their partners (t (133) = -1.94; p < 0.001), that is, in both groups, women were younger. In relation to the duration of the marital relationship, the differences between male and female patients were only marginal (t (329) = 1.94; p < 0.1). In relation to dyadic adjustment and psychological morbidity, were verified that men presented higher dyadic adjustment and lower psychological morbidity (Table 1).

**TABLE 1** Characteristics of the sample (averages and standard deviations)

	Male patients		Female patients	
	Patient	Partner	Patient	Partner
Age (years)	59.4 (11)	56.7 (11.1)	59.7 (9.5)	61.6 (9.4)
Relationship duration (months)	381.1 (156.1)		413.6 (140)	
Dyadic adjustment	53.7 (6.9)	52.5 (8.3)	53.1 (9.2)	54.6 (8)
Psychological morbidity	8.8 (6.8)	13.8 (8.7)	11.5 (8.3)	8.4 (7)

### APIM models

To test the actor and partner effects of dyadic adjustment on psychological morbidity, the best adjustment and most parsimonious model within each group was found (i.e. male patients and their female partners, and female patients and their male partners). The actor effects were restricted to be equal (i.e. the two connections between each dyadic adjustment and psychological morbidity) as well

partner effects (i.e. the two connections between each dyadic adjustment and the psychological morbidity of the partners) within each group, and no connection was restricted to equal between the groups (Table 2, model 1.1).

When observing the first comparison between models for the actor effects within each group, we determined that the actor effects were not equivalent, both for male patients and their female partners ( $\chi^2_{(1)} = 5.84^*$ ), and female patients and their male partners ( $\chi^2_{(1)} = 9.3^{***}$ ). Releasing the actor effects, the adjustment of this model in relation to the base model improves both for male patients (Table 2, model 1.2a) and female patients (Table 2, model 1.2b).

A similar comparison was conducted on the two connections between the patients and partners (partner effect). Through the comparison of the adjusted model with the base model, it was determined that the partner effects were equivalent both for male patients and their female partners ( $\chi^2_{(1)} = 0.77$ ; Table 2, model 1.3a) and female patients and their male partners ( $\chi^2_{(1)} = 2.02$ ; Table 2 model 1.3b). Thus, the equality of the constraints was only retained for the partner effects (Table 2).

**TABLE 2** Comparison of models in the dyadic effects of dyadic adjustment on psychological morbidity

Model	$\chi^2$	df	CFI	RMSEA
<b>Analysis within groups</b>				
1.1 Actor and partner effects constricted within each group	17.70**	4	0.929	0.102
1.2 Actor effects				
1.2a Actor effects free in the male patients group	11.86**	3	0.954	0.095
1.2b Actor effects free in the female patients group	8.40*	3	0.72	0.074
1.3 Partner effects				
1.3a Partner effects free in the male patients group	16.93**	3	0.928	0.119
1.3b Partner effects free in the female patients group	15.68**	3	0.934	0.113

\*\* p < 0.01, \* p < 0.05

Next, using the best adjustment model determined by the analysis with the groups (Table 3, model 2.1), the equivalence of the actor effects between the two groups was examined. No connection was constrained between the two groups in the base model. Initially, the actor effect of male patient of dyadic adjustment on psychological morbidity



**TABLE 3** Gender differences in the dyadic effects of dyadic adjustment on psychological morbidity

Model	$\chi^2$	df	CFI	RMSEA
<b>Analysis between groups</b>				
2.1. Base (starting model)	2.56	2	0.997	0.029
2.2. Actor effects of the patient				
2.2a. Male patient equal to female patient	9.91*	3	0.964	0.084
2.2b. Male patient equal to male partner	2.60	3	1.000	0.000
2.3. Actor effects of the partner				
2.3a. Female partner equal to female patient	3.13	3	0.999	0.011
2.3b. Female partner equal to male partner	7.53	3	0.977	0.068

\*  $p < 10.05$ 

was compared, successively constraining the effect of the male patient to that of the female patient (Table 3, model 2.2a) and equal to that of the male partner (Table 3, model 2.2b). Constraining these connections between the two groups, when the effect of the male patient is equal to that of the female patient, the adjustment ( $\chi^2_{(1)} = 7.35^{**}$ ) relative to the base model is reduced. But this does not occur when equaling the effect of the male patient with that of the male partner ( $\chi^2_{(1)} = 0.04$ ).

The same model comparison process was repeated to examine the differences of the actor effects of the male partner between groups, constraining the effect of the female partner equal to that of the female patient (Table 3, model 2.3a) and equal to that of the male partner (Table 3, model 2.3b). Constraining this connections to be equal between the two groups, when the female partner effect is equal to that of the female patient, the adjustment ( $\chi^2_{(1)} = 4.97^*$ ) relative to the base model is reduced. But this does not occur when equaling the effect of the female partner with that of the male partner ( $\chi^2_{(1)} = 0.04$ ).

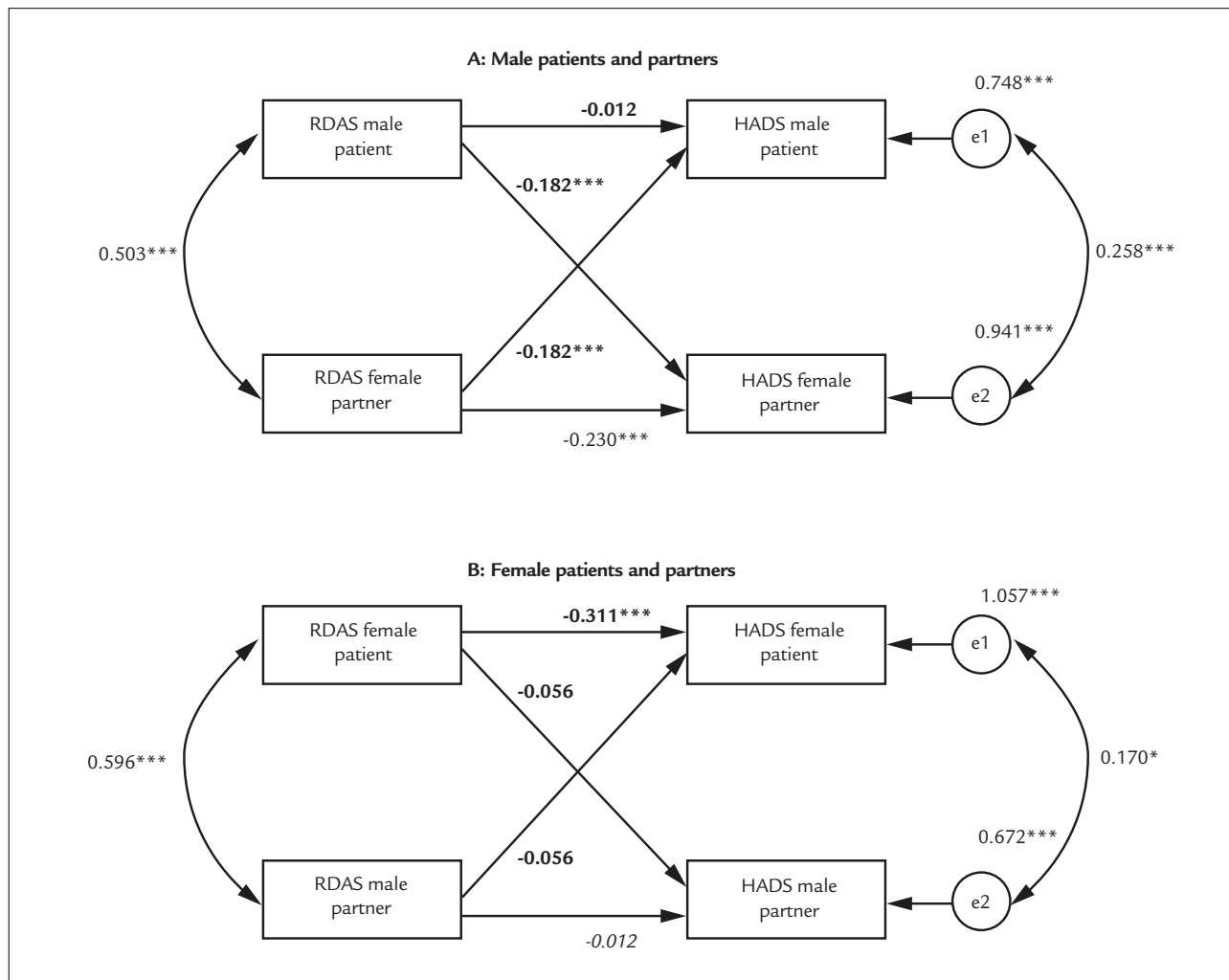
The selection of the final model was based on the modifications to the CFI and RMSEA values in relation to the base model, showing that the model with the best adjustment is model 2.2b (CFI=1.000; RMSEA=0.000), which is represented graphically in Figure 1. In summary, the actor effect of the female patients of dyadic adjustment on psychological morbidity (0.31<sup>\*\*\*</sup>) is stronger than that of their partners (0.01) and that of the female partners (0.23<sup>\*\*\*</sup>). In turn, the actor effect of female partners is stronger than female patients and their partners (-0.01). Furthermore, the partner effect of male patients and their female partners (-0.18<sup>\*\*\*</sup>) is stronger than that of female patients and their partners (-0.06) (Figure 1).

## DISCUSSION

Although the dyadic approach is a strong aspect in the present study, constituting an innovative statistical approach, the results are based on a cross-sectional design and, therefore, it is not possible to determine the causality of the relationship.

Despite the limitations, it was verified in the study that diabetic men showed better dyadic adjustment and lower psychological morbidity. These results are in accordance with the literature, given that on average women experience twice as much depression than men<sup>30</sup> and more distress as patients and partners.<sup>31</sup> In turn, men generally present a better marital relationship, given that as a result of being overloaded with different roles, women experience more stress in the marital relationship and less marital satisfaction.<sup>32</sup> This can be associated with the diversity of roles they perform, and their inherent responsibilities. The marital relationship functions as a buffering factor for the stress experienced and reduces psychological morbidity. It is therefore natural for men to perceive better dyadic adjustment and equally experience less psychological morbidity.<sup>20</sup> In fact, the literature has been demonstrating that it is not being married by the quality of the marital relationship and interaction that are positively associated with better physical and mental health.<sup>33</sup>

On the other hand, a negative relationship has been verified between dyadic adjustment and psychological morbidity in diabetic patients. The psychological morbidity of the partner is related with the psychological morbidity of the patient, whether male or female. In diabetic men and women, the dyadic adjustment, as well that of their partners, is associated with lower psychological morbidity. These results are in accordance



**FIGURE 1** Dyadic analysis of patients and partners. A: male patients and partners; B: female patients and partners. \*\*\*  $p < 0.001$ , \*  $p < 0.05$ . Note: the estimates in bold indicate the constrictions from the first stage and the estimates in bold and italics indicated the constrictions in the second stage.

ce with the literature indicating that the partner may present symptoms of distress and anxiety and depression levels as high as the actual patient.<sup>8</sup> This interaction between patient and partner has implications for chronic disease. Studies suggest that social relationships, financial condition, leisure time and professional commitments are the areas negatively affected by the chronic disease in the partner's life. The areas positively affected are the increase in self-esteem and sense of intimacy. Furthermore, the life of partners is affected by the increased responsibility as carers.<sup>34</sup> Moreover, some studies suggest that the quality of life of partners tends to be lower than that of the patient, especially in female partners.<sup>35,36</sup>

It was also verified that the relationship between dyadic adjustment and psychological morbidity in diabetic women is stronger than in diabetic men (in which it is not significant) than in the female partners of male diabetics. In fact, women tend to be more emotionally and physically responsive to the psychological aspects of the relationship than their partners, and may more readily feel the effects of dyadic maladjustment.<sup>37,38</sup> The results of the dyadic models showed that dyadic adjustment is more strongly associated with psychological morbidity in the female partners of male diabetics than the male partners of female diabetics (in which it is not significant). This result is somewhat in line with the previous result, given that mental health in women is more influenced by the quality of the

relationship than men.<sup>39</sup> Furthermore, chronic disease may be felt as an additional stressor either directly, in women suffering from diabetes, or by female partners dealing with the diseases of their partner as, in addition to the roles and responsibilities they perform in their daily lives, they also have the added responsibility of managing the illness.<sup>40</sup> In addition to the added stress of managing the disease, women may experience the added stress of dealing with a chronic disease, given that they are more concerned with health, using health services more often and spending more on health goods than men.<sup>41</sup> These facts may make women more sensitive to the symptoms and changes in the state of health of partners and themselves, as patients, making them seek the use of health services with greater regularity.<sup>41</sup> According to Boeing,<sup>42</sup> women and patients with diabetes are part of the group of patients that rely on physicians the most, among others.

In diabetic men, the relationship between dyadic adjustment and psychological morbidity in their partners is stronger than the relationship between dyadic adjustment and psychological morbidity in the male partners of diabetic women. This result once again illustrates the importance of the marital relationship on psychological morbidity in women with chronic diseases or the female partners of men with chronic diseases.<sup>8</sup>

This study only covered the moderating role of gender, however, other characteristics such as the duration of the diagnosis or the type of support by the partner in a scenario of diabetes *mellitus* may be determinant factors in the relationship between dyadic adjustment and morbidity. Future studies should be conducted to study these variables as potential moderators.

Given the relationship between dyadic adjustment, psychological morbidity and adherence to treatment, it is important for relationship related aspects to be taken into consideration, as well as evaluating depression and anxiety, given their impact on the management of diabetes, especially self-care at the level of diet.<sup>43</sup> In this study, patients and partners were only evaluated at the psychological level at the level of morbidity. Future studies should also control the presence of other comorbidities that could interfere in the relationship between morbidity and dyadic adjustment.

Therefore, health professionals with a central role in health education, particularly diabetes, should be sensitive to gender aspects and take into consideration the specific needs of diabetic women and men, in terms of increasing their management of the disease to the level of self-care.

Thus, health professionals in training should be warned about issues of gender as determinant on health, de-

veloping sensitive approaches to men and women, thereby ensuring both have equal access to healthcare.

Through the proximity that health professionals have with the family environment of the population, it is important for interventions to cover the cognitive and behavioral aspects inherent in the management of the disease, as well as emotional aspects that interfere in the way in which the person and their family adapt to the new health situation. The health professional should undertake a careful evaluation of the individual's needs of each of the elements, but also the dyad, paying attention to aspects such as verbal and nonverbal emotional communication, roles, influence and power, beliefs and marital satisfaction.<sup>44</sup>

## CONCLUSION

This study showed the relationship between dyadic adjustment and psychological morbidity in type 2 diabetes. Gender was revealed as a moderating factor in this association.

In general, diabetic women and the female partners of male diabetics showed the most negative relationship between marital adjustment and psychological morbidity. Thus, female patients and female partners present greater vulnerability in dealing with the chronic disease, owed to the roles they perform, emphasizing social and cultural aspects associated with gender. Given that gender is a moderator variable, it is important to attend to the specific needs of male and female patients, and the education of diabetic patients should be centered on the patient/partner dyad.

Taking into account the results obtained in this study, it is important for female partners of diabetic patients, already presenting psychological morbidity, to be able to benefit from education programs and, on the other hand, for patients and partners to be able to collaborate on the patient's adherence to self-care, associated with a decrease in health costs.<sup>45</sup>

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## RESUMO

Um estudo de casal sobre o diabetes tipo 2: ajustamento conjugal e morbidade psicológica.

**Objetivo:** avaliar o ajustamento conjugal e a morbidade psicológica em pacientes diabéticos tipo 2 e seus parceiros, estudando o papel do gênero.

**Métodos:** estudo transversal que incluiu uma amostra de 214 diabéticos e os respectivos parceiros, foram avaliados no nível da morbidade (HADS) e de ajustamento conjugal (RDAS). Os dados foram analisados por meio de um procedimento estatístico de análise diádica, que estuda simultaneamente os pares paciente/parceiro(a).

**Resultados:** verificou-se que a relação negativa entre ajustamento conjugal e morbidade psicológica nas mulheres diabéticas era mais forte que nos homens diabéticos e suas parceiras. Por sua vez, a relação entre ajustamento conjugal e morbidade psicológica nas parceiras de homens diabéticos foi mais forte que a mesma relação nos parceiros de mulheres diabéticas.

**Conclusão:** dado o gênero ser uma variável moderadora, é importante atender às necessidades específicas dos doentes femininos e masculinos e a educação do paciente diabético deve centrar-se na díada paciente/parceiro.

**Unitermos:** diabetes melito; morbidade; casamento; identidade de gênero; prestação de cuidados de saúde; estudos transversais.

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