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RESEARCH ARTICLE

GENDER DIFFERENCES IN EMOTIONAL REGULATION IN PATIENTS WITH DIABETES

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ABSTRACT

Diabetes is a chronic disease due to a failure in the regulation of blood sugar levels and is favored by a genetic and lifestyle predisposition. Of the three types (type 1 and 2, gestational), type 2 diabetes is the most common. Given its costly and painful treatment, its incurable and disabling nature, and its high mortality rate, one might think that people with this disease experience emotions more strongly and permanently. Consequently, these people may experience difficulties in regulating their emotions. The present study is part of the research conducted on individual differences in the use of emotional regulation strategies. Its objective is to study the influence of gender on emotion regulation difficulties in patients with diabetes. To this end, 198 volunteer patients (101 women and 97 men), ranging in age from 34 to 64 years, completed the *Difficulties in Emotion Regulation Scale (DERS-F)* by Dan-Glauser and Scherer (2013). The results indicate an effect of gender on emotional regulation and that this influence depends on the type of emotional regulation difficulties. In other words, there is a difference between men and women with diabetes in their ability to accept emotional responses, control themselves and engage in goal-directed behavior in a negative emotional context, and understand their emotions. Furthermore, the study reveals that the majority of men with diabetes, like women, are more frequently able to identify their own emotions but frequently have more difficulty implementing emotion regulation strategies in a negative emotional context.

INTRODUCTION

Emotions are "brief and intense reactions" that allow individuals to respond appropriately to environmental demands. They are therefore adaptive (Lazarus, 1991). However, emotions can be non-adaptive in nature, intensity, feeling, expression or duration, especially when they are harmful. For example, in the case of chronic diseases, because of their costly and painful treatment, their incurable and disabling nature and their high mortality rate, patients may experience emotions in a stronger and more lasting way. As a result, they may have difficulty regulating their emotions. It turns out that these emotions need to be regulated when they become harmful. In other words, one should be able to control the intensity and expression of one's own emotions or even those of others. Emotional regulation is the set of strategies used to attenuate (negative regulation), maintain or increase (positive regulation) one or more components of the emotional response, in valence as well as in intensity and duration (Gross, Richard & John, 2006; Gross & Thompson, 2007; Young, Sandman & Craske, 2019). Thus, regulation requires the mobilization of a set of adjustment strategies. These strategies or processes, according to Gross (2002), can be applied in a controlled or spontaneous, conscious or unconscious manner and make it possible to influence the emergence of emotions, for example, the moment to manifest them or the manner of expressing them and feeling them, Gross and John (2003) distinguish two types of emotion regulation strategies: cognitive reappraisal and expressive suppression.

Cognitive reappraisal, which focuses on the antecedents of the emotional response, constitutes the process of response emergence and includes four modes of regulation, namely situation selection, situation modification, attentional redeployment and cognitive reappraisal. Thus, reappraisal focuses on controlling the personal meaning that events have for the individual, whereas suppression focuses on controlling the behavioral responses to these events. Expressive suppression thus focuses on the consequences of the emotional response and occurs once the individual has conferred emotional meaning on the situation (Gross, 1998). In addition to reappraisal and suppression, several other strategies have been highlighted by Ayduk and Kross (2010) and Kross (2012), who distinguish reinterpretation (the modification, voluntary or not, of the meaning attributed to a stimulus) from distancing, which is a distancing, a detachment of the self from the stimulus. Morris, Silk, Steinberg, Myers, & Robinson (2007) speak, on the one hand, of proactive regulation, in which the person implements strategies prior to the occurrence of the affect with the dual aim of limiting negative affects and exacerbating positive affects, and, on the other hand, of reactive regulation, in which the implementation of strategies follows the occurrence of the affect. Poor emotional regulation would constitute a factor of vulnerability to the development of psychopathological and relational disorders (Gross & Levenson, 1997; Rime, Philippot, Boca, & Mesquita, 1992). In this perspective, instruments have been developed to assess difficulties in emotion regulation: the *Emotion Regulation Questionnaire (ERQ)* by Gross and John (1998), the *Difficulties in Emotion Regulation Scale (DERS)*, a validation of the ERQ by Gratz and Roemer (2004),

Christophe and collaborators (2008) and Dan-Glauser and Scherer (2013). This research identified several dimensions regarding difficulties in emotion regulation: (1) non-acceptance of emotion, (2) difficulties in goal-directed behaviors, (3) difficulties in controlling impulsive behaviors, (4) lack of emotional awareness, (5) limited access to emotion regulation strategies, and (6) lack of emotional clarity. Thus, appropriate emotional regulation requires the ability to understand, accept, and modulate emotions as well as to adapt behavior. Research has shown that this ability is influenced by gender. Indeed, most of the research on gender differences has been conducted in the area of emotional expression (Brody & Hall, 1993; Fischer, 2000; Saarni, 1990) and in the specific framework of emotional regulation strategies. On the one hand, most of the results of the research that has focused on expression are not convergent. For example, with regard to the decision to withhold or express emotions, some studies find that girls express negative emotions less, while other studies reveal the opposite. Notwithstanding this discrepancy, these differences have been explained by socialization and social expectations. On the other hand, other research has not been able to show a difference between the sexes in the control of the emotions of anger (Fuchs & Thelen, 1988) and joy (Undenwood, 1997). On the other hand, regarding emotional awareness and acceptance of emotional responses, it turns out that girls have higher expectations of understanding from others for their negative emotions, acceptance, for their emotional expressions and support from others (Zeman & Shipman (1997). On the other hand, regarding emotional regulation strategies, Christophe and al. (2008) and Tamo and al. (2020), who studied the consequences of emotion regulation through reappraisal and suppression, showed that women would use cognitive reappraisal more while men would use suppression more and would be less likely to experience negative affect. In addition, men might be more likely to suppress sadness but less likely to suppress anger than women. However, the results of Gross and John's (2003) study did not show a gender difference: men's cognitive reappraisal and expressive suppression strategies did not differ from women's. Furthermore, in terms of emotional regulation difficulties, men would have more difficulty regulating their emotions than women, due to the fact that men are more reactive to emotions than women (Morris et al., 2007). These gender differences in emotional expression and regulation have more often been explained by ethnicity and personality (Arnold, 1960; Kelmer, Gruenfeld & Anderson, 2003), social context (Zeman & Garber, 1997), as well as age (Carstensen et al., 1999; Le Vigoureux et al., 2016; Makowski et al, 2015) and have been studied, in general, in healthy individuals. What about people with chronic pathology, specifically diabetes, whose consequences, cost, and representation are likely to provoke relatively strong emotional episodes? Is there a difference between these men and women with this disabling and incurable disease in their ability to use emotion regulation strategies? The present study is part of the research conducted on individual differences in the use of emotional regulation strategies. Its objective is to study the influence of gender on emotion regulation difficulties in patients with diabetes. More precisely, it is a question of knowing if there are differences between men and women with diabetes in their capacity to identify, accept, control and understand their emotions.

METHODS

Participants: The participants are voluntary diabetic patients followed at the National Institute of Public Health. This center has two anti-diabetic centers in Abidjan (Côte d'Ivoire): the pediatric center and the adult center. Because the complexity of the questionnaires required a sustained communication capacity, the survey was conducted at the adult diabetes center. The patients were suffering from type 2 diabetes (T2DM), a type of diabetes previously called maturity-onset diabetes, because it usually occurs in adulthood, unlike type 1 diabetes called juvenile diabetes. One hundred and ninety-eight male and female patient volunteers (101 women and 97 men), ranging in age from 34 to 64 years, participated in this study. Data on the mean age and standard deviation of men and women are presented in Table 1.

Table 1. Distribution and characteristics of diabetic patients by gender

	Men (34-49 years old)	Women (50-64 years old)
Number of participants	97	101
Average age	55,71	52,09
Standard deviation	9,85	10,10

Materials

General Information Questionnaire: Participants were offered an information sheet to collect additional information. This information was related to age, gender, education level, occupation, marital status, type of diabetes, date of first diagnosis, subsequent dates of diabetes diagnoses, presence of other medical conditions, type of treatment completed and in progress, and whether or not they were hospitalized at the time of participation.

The Difficulties in Emotion Regulation Scale (DERS): The *Emotional Regulation Questionnaire* (ERQ) developed by Gross and John (2003) and adapted into French by Christophe et al. (2009) focuses, on the one hand, on cognitive reappraisal, which consists of changing one's way of thinking about an emotional situation, and, on the other hand, on expressive suppression, which refers to the inhibition of emotional expression in an emotional situation. The Emotional Regulation Scale or "*Difficulties in Emotion Regulation Scale* (DERS- F)" by Dan-Glauser and Scherer (2013) used in the present research seems more comprehensive and based on a theoretical model documenting emotion management strategies. In addition, this questionnaire has a very satisfactory internal consistency ($\alpha = 0.94$ for the total score; $\alpha = 0.74$ to 0.90 for the subscales) and good temporal stability (4 to 8 weeks; total score: $r = .84$; subscales: $r = .67$ to $.81$) (Côte, Gosselin & Dagenais, 2013). The DERS consists of 36 items and measures regulatory difficulties across six dimensions:

- N, *Non acceptance*: non-acceptance of one's emotional response (e.g. item 12: "When I am upset, I am embarrassed to feel such an emotion").
- G, *Goals*: Difficulty with goal-directed behaviors in a negative emotional context (e.g., item 18: "When I am upset, I have difficulty focusing on other things").
- I, *Impulse*: difficulty controlling oneself in a negative emotional context (e.g. item 27: "When I am upset, I have difficulty controlling my behaviour").
- A, *Awareness*: lack of emotional awareness (e.g., item 10: "When I am upset, I take that emotion into account").
- S, *Strategies*: difficulty implementing emotion regulation strategies in a negative emotional context (e.g., item 35: "When I'm upset, it takes a while before I feel better").
- C, *Clarity*: difficulty identifying one's own emotions (e.g., item 4: "I have no idea how I feel").
- The DERS is a five-point Likert-type scale ranging from 1 (*almost never*) to 5 (*almost always*). Some items must be reversed, including items 1, 2, 6, 7, 8, 10, 17, 20, 22, 24 and 34.

Procedure: Participation in medical consultations provided an opportunity for brief discussions with patients about their perception of diabetes. Patients who agreed to take part in the research were first informed about the purpose of the research, the possible risks of participation, and the right to withdraw and the measures planned to guarantee the confidentiality of their information. The participants then signed the consent form and completed the identification questionnaire. In order to avoid testing subjects who were already worn out by the disease, the DERS was completed during another medical consultation. The administration took 35 to 45 minutes. The test was administered individually in the waiting room. The instructions were as follows:

"The DERS is a scale to assess how attentive you are to your emotions in everyday life, how well you use the information your emotions give you, and how you react in general. Answer all the questions by checking only one box per statement, depending on whether the statement fits you.

A score is first computed for each of the underlying dimensions (ranging from 5 to 40) for each participant, by calculating the sum of their responses to the items corresponding to each of these dimensions.

Then, a score (global score) is calculated for these underlying dimensions taken as a whole (varying between 36 and 180), by calculating the sum of the scores obtained for each of the underlying dimensions. Multivariate analysis of variance was used to measure the effect of gender on emotional regulation, using SPSS software, given the six modalities or dimensions of the dependent variable (regulation difficulties).

RESULTS

Relationship between sex and emotional regulation

Relationship between gender and emotional regulation: Table 3 shows the distribution of type 2 diabetic patients according to gender and emotional regulation as assessed by the DERS-F scale of Dan-Glauser and Scherer (2013). When considering the underlying dimensions as a whole (Total Emotional Regulation), i.e. the overall score obtained by adding the scores of the six.

goal-directed behaviour in a negative emotional context ($\chi^2(1) = 4.17, p < .05$); to control oneself in a negative emotional context ($\chi^2(1) = 9.97, p < .001$); to implement emotion regulation strategies in a negative emotional context. In contrast, the χ^2 test did not reveal an association between gender and emotional regulation for the underlying dimensions 'Lack of emotional awareness' ($\chi^2(1) = 3.61, ns$); 'Limited access to emotional regulation strategies' ($\chi^2(1) = 4.25, ns$) and 'Lack of emotional clarity' ($\chi^2(1) = 0.91, ns$).

Influence of gender on emotional regulation: The multivariate analysis of variance highlights the differences between men and women with respect to all six underlying dimensions of the emotional regulation scale and then for each of these dimensions (Table 3). Table 3 shows the average scores of men and women with diabetes on the Dan-Glauser and Scherer (op cit.) Emotional Regulation Scale. For all dimensions, the statistical test reveals that there is a significant gender difference [F(1,196) = 4.46, $p < .01, \eta^2 = .022$]. Diabetic men have lower scores (M = 95.71, SD = 13.46) than diabetic women (M = 99.80, SD = 12.77). This suggests that women with diabetes have more difficulty regulating their emotions in the face of the disease than men. Gender therefore influences the emotional regulation of diabetic patients. This influence also appears on the dimensions "Non-acceptance of emotional responses" [F(1,196) = 4.46, $p < .01, \eta^2 = .022$]; "Difficulty with goal-directed behaviors" [F(1, 196) = 5.05, $p < .05, \eta^2 = .025$]; "Difficulty controlling impulsive behaviors" [F(1, 196) = 6.61, $p < .01, \eta^2 = .03$]; "Lack of emotional awareness" [F(1, 196) = 7.20, $p < .01, \eta^2 = .035$]. On the other hand, the difference between men and women with diabetes was not statistically significant for the dimension "Limited access to emotion regulation

Table 2. Distribution of diabetic patients according to gender and emotional regulation

Difficulties in Emotion Regulation (DERS-F by Dan-Glauser and Scherer (2013)	Gender	Emotional regulation		χ^2
		No difficulties	Difficulties	
Non-acceptance of emotional responses	Men	43 (21,7%)	54 (27,3%)	5,78**1
	women	62 (31,3%)	39 (19,7%)	
Difficulty in adopting a behavior	Men	61 (30,8%)	36 (18,2%)	4,18*
	Women	77 (38,9%)	24 (12,1%)	
Lack of awareness emotional	Men	81 (40,9%)	16 (8,1%)	3,61
	Women	73 (36,9%)	28 (14,1%)	
Difficulty in controlling dimensions	Men	50 (25,3%)	47 (23,7%)	9,97***
	Women	74 (37,4%)	27 (13,6%)	
Limited access to regulatory strategies emotional	Men	93 (47,9%)	4 2,0%	4,25
	Women	101 (51,0%)	0 (0%)	
Lack of emotional clarity	Men	60 (30,3%)	37 (18,7%)	0,91
	Women	69 (34,8%)	32 (16,2%)	
Total emotional regulation	Men	76 (38,4%)	21 (10,6%)	4,23*
	Women	90 (45,5%)	11 (5,6%)	

Table 3. Multivariate analysis of variance

Difficulties in Emotion Regulation (DERS-F by Dan-Glauser and Scherer (2013)	Gender	Everage	Standard deviation	F ¹	η^2
Non-acceptance of emotional responses	Men	14,47	5,03	4,46*	,022
	women	16,01	5,195		
Difficulty in adopting a behavior	Men	13,53	3,81	5,05*	,025
	Women	14,69	3,60		
Lack of awareness emotional	Men	16,07	5,04	7,20**	,035
	Women	17,85	4,80		
Difficulty in controlling dimensions	Men	19,35	4,58	6,61**	,03
	Women	17,79	4,31		
Limited access to regulatory strategies emotional	Men	19,25	3,56	2,88	,014
	Women	20,04	3,41		
Lack of emotional clarity	Men	13,04	1,86	3,10	,016
	Women	13,53	1,90		
Total emotional regulation	Men	95,71	13,46	4,93*	,025
	Women	99,80	12,77		

The underlying dimensions of DERS, Chi-square statistical analysis shows that men and women with diabetes manage their emotions differently ($\chi^2(1) = 4.22, p < .05$) (Table 2). Furthermore, the Chi-square statistical analysis also indicates a relationship between gender and emotional regulation with regard to the difficulties, for men and women with diabetes, in accepting their emotional responses ($\chi^2(1) = 5.77, p < .01$); to engage in

strategies" [F(1, 196) = 2.88, ns] and the dimension "Difficulty identifying one's own emotions" [F(1, 196) = 3.10, ns]; This undoubtedly explains the fact that the majority of diabetic men, like women, are more frequently able to identify their own emotions (Mmen = 13.04, SD = 1.86, Mwomen = 13.53, SD = 1.90) but frequently have more difficulty implementing emotion regulation

strategies in a negative emotional context (Mwomen = 20.04, SD = 3.41; Mmen = 19.25, SD = 3.56).

DISCUSSION

The aim of the present study is to investigate the influence of gender on emotion regulation difficulties in patients with diabetes. More precisely, it is a question of knowing if there are differences between men and women with diabetes in their capacity to identify, accept, control and understand their emotions. It should be noted that emotional regulation was studied here as assessed by the "Difficulties in Emotion Regulation Scale (DERS-F)" by Dan-Glauser and Scherer (2013). To this end, the differences studied relate to (1) non-acceptance of emotion, (2) difficulties in adopting goal-directed behaviors, (3) difficulties in controlling impulsive behaviors, (4) lack of emotional awareness, (5) limited access to emotion regulation strategies, and (6) lack of emotional clarity. On the one hand, the results show an effect of gender on dimensions (1), (2), (3) and (4); indicating that women with diabetes have more difficulty accepting, coping, controlling and understanding their emotions than men. Given that these four modes of emotional regulation correspond to cognitive reappraisal (Gross & John, 2003), we could relate these results to those of Christophe et al. (2008), who studied the consequences of emotion regulation by cognitive reappraisal and suppression; although these authors, contrary to our data, find that women would use cognitive reappraisal more. Do women with diabetes tend to use expressive suppression as well as men, referring to the work of Gross and John (2003) who found that men and women use reappraisal and emotional suppression strategies to the same extent to regulate their emotions? Furthermore, our results are not consistent with those of Morris et al. (2007), who had shown in healthy individuals that men would have more difficulty regulating their emotions than women, due to the fact that men are more reactive to emotions than women. Moreover, the results of the present study are not in accordance with those of Zeman and Shipman (1997), who found that girls have higher expectations of understanding from others for their negative emotions, acceptance for their emotional expressions and support from others. This contradiction with our data would likely be related to a moderating effect of age (Le Vigoureux et al., 2016; Makowski et al, 2015); the diabetic men and women who participated in the study were older adults (Men: 56 years and Women: 52 years). Moreover, at this age, according to social-emotional selectivity (SES) theory, "regulating one's emotion becomes a more salient goal" (Carstensen et al, 1999); therefore, our participants should not have emotional regulation difficulties.

On the other hand, the results reveal that the majority of men with diabetes, like women, are more frequently able to identify their own emotions. This could be attributed to their therapeutic management; follow-up by a doctor, psychologist, social worker or specialized educator to enable them to understand the objective of the treatment and to adhere to it. This psycho-medical support also allows diabetic patients to adopt appropriate behaviors and to help them overcome their fear, anxiety, stress and fear. However, this accompaniment does not seem to have the desired effect in our participants, since they frequently have more difficulty implementing emotion regulation strategies in a negative emotional context. Probably, the participants would use other forms of strategies focuses in particular either on the emotion (modification of the perception of the stressful event either by taking distance or by a positive revaluation), or on the problem (concrete modification of the stressful environment by controlling the situation) or on social support (search for moral support, assistance and information).

CONCLUSION

The data set revealed that women and men with type 2 diabetes experience emotional regulation difficulties differently. Women frequently have more difficulty accepting and understanding their emotional response. They also have difficulty with self control and

behaviors in a negative emotional context. These results could be of great importance insofar as they contribute to making therapeutic education more effective, corresponding to the help given to patients, their families and/or their entourage to understand the disease and their treatments adhere to care and improve quality of life. Therefore, a pedagogical differentiation within the framework of this therapeutic education would be necessary. Another interest of the present study is to have highlighted that, although diabetic patients, whatever their sex, show more frequently emotional clarity, they often have difficulties to set up emotion regulation strategies in a negative emotional context. It would therefore be crucial, in the medical-psychological management of patients, to emphasize the different existing emotional regulation strategies. It is therefore appropriate to suggest that future research take into account other variables, notably the representation of the disease, the socio-cultural context, the beliefs and the age of the patients, given the complexity of the emotional regulation processes.

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