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Alexithymia and Psychological Distress Affect Perceived Quality of Life in Patients with Type 2 Diabetes Mellitus

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Abstract

Backgrounds: Psychological factors may affect patients' ability to cope with chronic illness, which occur with a high incidence as they represent age related disorder. Anxiety, depression and alexithymia could specifically interfere with compliance and adherence leading to predictable consequences and predicting morbidity and mortality independently of several confounders. The present work aims at investigating the relationship between alexithymia and affective dimension such as anxiety and depression levels, and health related quality of life in T2DM patients. Particularly, alexithymia was analyzed in its three main facets and time since diagnosis was considered with also metabolic control.

Methods: Forty seven patients with T2DM were consecutively enrolled and assessed with a gold standard interview and with a psycho-diagnostic evaluation. Clinical psychological exploration consisted of HAM-A, BECK-II, SF-36 and TAS-20 administration. Statistical analysis was performed using IBM SPSS statistical version 25. Data were analyzed anonymously.

Results: 47 participants showed moderate depressive symptoms as confirmed by the mean BDI-II and HAMA-A score (15.14 ± 8.95 and 24.31 ± 6.95 , respectively), suggesting a high prevalence of anxiety in the enrolled subjects. It was observed a lower perceived QoL as resulted by the MCS and PCS mean values (37.68 ± 9.41 and 39.31 ± 12.29 , respectively) and TAS-20 highlighted considerable mean values of 60.53 ± 7.93 in the recruited participants with a prevalence in EOT values (27.51 ± 4.27), in comparison with mean DID and DDF values (17.26 ± 5.52 and 15.48 ± 3.84 , respectively).

Conclusions: Our study may suggest a predictive role of alexithymia in patients with T2DM. Moreover, lower PCS and MCS, revealing worst perceived QoL were associated to both higher anxiety and disease duration.

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1. Introduction

Psychological factors may affect patients' ability to cope with chronic illness, which occur with a high incidence all over the world as they represent age related disorder (Castelnuovo et al., 2015; Gangemi et al., 2018; Lai et al., 2019; Quattropani et al., 2019; Settineri et al., 2019c; Stanton et al., 2017; Van Houtum et al., 2015; Vicario et al., 2013, 2019).

It is known that depression and anxiety maybe be considered as predictors of chronic diseases (Catalano et al., 2018; Conversano, 2019; Kelly et al., 2019; Marchi et al., 2019; Martino et al., 2019a, 2019b, 2019c). In fact, they could specifically interfere with compliance and adherence leading to predictable consequences and predicting morbidity and mortality independently of several confounders. On the other hand, chronic conditions may provoke clinical psychological outcomes (Settineri et al., 2019c) as they influence mental health and perceived quality of life (Guicciardi et al., 2019; Martino et al., 2018a, 2018b), which in turn could impact on the illness self-management (Marchini et al., 2018).

Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disease characterized by high levels of blood glucose concentration due to insulin resistance and deficiency. T2DM affects around 285 million worldwide and it is estimated will rise over to 430 million by the year 2030 (Whiting et al., 2011). It is well known that the high prevalence of psychological features as depression and anxiety in T2DM is significantly and positively related with age and female gender (Shnikov et al., 2018). Several studies analyzed 30% and 20% of the patients with T2DM show depressive and anxious symptoms respectively and that diabetes increases the risk of mental disorders (Anderson et al., 2001; Bradley et al., 2005; Carmassi et al., 2014; Castelli et al., 2012; Li et al., 2006; Marchi et al., 2019). It is also suggested diabetes may be considered a relevant risk factor for anxiety symptoms and that a healthy status could prevent anxiety (Amiri et al., 2019). However, Martino et al. (2019b) highlighted anxiety negatively affects the perceived quality of life in patients with T2DM of long duration, analyzing that anxiety levels and disease duration have a predictive role in health-related quality of life in patients with T2DM (Bowman et al., 2010). It is likewise reported that poor metabolic control in patients with T2DM is associated also with alexithymia, which is a multidimensional feature conceptualized as the inability to recognize feelings, thoughts and neurophysiological responses and to discriminate emotions (Lumley et al., 2005a, 2005b, 2007). Moreover, alexithymia negatively affects clinical case presentation, degree of disease progression, compliance and adherence (Settineri et al., 2019c). In fact the often unconscious approach characterized by the inability to suppress or describe perceptions, thoughts, feelings and emotions, increases these own features (Settineri et al., 2019b, 2019d), leading to psychological and physical outcomes which in turn compromise the ability to manage T2DM. In fact, patients with high levels of alexithymia show both poor ability to reflect, to comprehend and self-regulate their emotions and thus to share them (Craparo et al., 2016; Taylor et al., 1997, 2000; Torrado et al., 2018), efficiently and in a way aimed at achieving a fundamental goal: maintaining one's health.

The conceptual construct involving alexithymia as a personological trait consisting in a deficit of regulation and emotional processing showed its role in the pathogenesis of several somatic diseases (Mazaheri et al., 2012; Porcelli et al., 1996; Talamonti et al., 2016; Willemsen et al., 2008). However, it has been confirmed alexithymia may also consist in a transient variable state, related to the stress levels and the presence of psychopathological conditions (Pollatos et al., 2011). Avci and Kelleci (2016) explored the prevalence of alexithymia and affecting factors in metabolic syndrome, highlighting that poor glycemic control was a preventable risk factor for alexithymia, anxiety and depression and suggesting patients' management and follow-up should include mental health care programs.

It is also known that chronic pain is often associated on one side with chronic diseases (Catalano et al., 2017) including diabetes, with special regard to its known consequences, as macro- and micro-angiopathy and neuropathy, and on the other side with psychological features, affective suffering and alexithymic traits (Marchi et al., 2019). Overall, the detection of alexithymia in patients with chronic pain and its impact on pain intensity is still unclear and data are contrasting, varying from not significant association (Catalano et al., 2017; Lumley et al., 2005a; Veltri et al., 2012), weak correlation (Lumley et al., 2005b) and relation mediated by depressive symptoms. Therefore, the strictly role of alexithymia, psychopathological symptoms and perceived quality of life in T2DM patients has not been fully clarified.

The present work aims at investigating the relationship between alexithymia and affective dimension such as anxiety and depression levels, and health related quality of life in T2DM patients. Particularly, alexithymia was analyzed in its three main facets and time since diagnosis was considered with also metabolic control.

2. Materials and methods

Forty seven patients with T2DM were consecutively enrolled at the Department of Clinical and Experimental Medicine, University Hospital "G. Martino" of Messina, Italy. Patients were affected by T2DM, according to the American Diabetes Association criteria (American Diabetes Association, 2018). Inclusion criteria were: age range from 55 to 75 years; T2DM time since diagnosis >5 years; oral stabilized treatment with hypoglycemic agent (metformin) in the last 12 months; a screening for diabetic related outcomes in the last 6 months; Mini-Mental State Examination score (MMSE) >24, to avoid bias due to the inability to fully comprehend or perform the psychological administration.

Exclusion criteria were: heart failure with New York Heart Association (NYHA) class >2; moderate and severe respiratory failure; moderate to severe kidney or liver failure; endocrine disorders other than DM (e.g., thyroid or parathyroid disease); severe musculoskeletal disease; cancer; cognitive impairment; neurologic or psychiatric condition, according to the Diagnostic and Statistical Manual of Mental Disorders diagnostic criteria (DSM-5, 2013) or use of psychotropic drugs.

2.1 Ethics

The study has been approved by the local Ethical Committee of the University Hospital “G. Martino”, University of Messina, Italy. All recruited participants have been informed about the scientific purpose of the study and gave their written informed consent. The entire evaluation has been performed as regular clinical practice assessment of patients. All participants were assessed by researcher in clinical psychology, in collaboration with physicians, and evaluated with both a gold standard interview and a psycho-diagnostic investigation (Fava et al., 2012), which consisted in: Hamilton Anxiety Rating Scale (HAMA-A), Beck Depression Inventory II edition (BDI-II) and Toronto Alexithymia Scale (TAS-20). Moreover illness duration and glycated hemoglobin (HbA1c) values were detected. Data were analyzed anonymously.

2.2 Measures

Data were collected including age, gender and education, considered as categorical variables. Medical data collected were height, weight, BMI, T2DM and related outcomes, T2DM time since diagnosis and metabolic control (Rosa et al., 2019). A gold standard diagnostic interview was performed by researcher in clinical psychology, to assess patient’s mental status (Caputo et al., 2013; Del Piccolo et al., 2015; Langher et al., 2017; Martino et al., 2019b; Tomai et al., 2017). The Toronto Alexithymia Scale (TAS-20), Italian version (Bressi et al., 1996), was performed to assess alexithymia. TAS-20 is a self-administered questionnaire comprising 20 items scored on a five-point Likert scale. TAS-20 consists of three subscales which represent three main features of alexithymia: Difficulty Identifying Feelings subscale (DIF), whose score concur seven items, which measures the difficulty in distinguishing between specific emotions and/or bodily sensations related to emotional arousal; Difficulty Describing Feelings subscale (DDF), whose score concur five items, which indicates the inability to verbalize one’s perceived emotions; Externally Oriented Thinking subscale (EOT), whose score concur eight items, which suggests the tendency to focus attention externally instead of considering interior emotional experience (Taylor et al, 1997, 2000, 2003).

The Hamilton Anxiety Rating Scale (HAM-A) was used to detect anxiety levels. HAM-A allows to detect psychological and somatic symptoms, such as anxious mood; tension; fears; insomnia; intellectual; depressed mood; somatic symptoms; sensory; cardiovascular; respiratory; gastrointestinal; genitourinary; autonomic and observed behavior during the interview. It consists of 14 items scored from 0, not present, to 4, severe (Hamilton, 1959), related to the perceived symptom's entity.

The Beck Depression Inventory-second edition (BDI-II), was performed to evaluate depression levels; it is made of 21 items, scored on a 4-point Likert scale for each proposed item (Beck et al., 1996; Ghisi et al., 2006).

The Short Form-36 (SF-36) questionnaire, Italian version, was used to detect patient's health perceived QoL (Apolone & Mosconi, 1998; Ware & Sherbourne, 1992), with reference to its indexes physical component summary (PCS), which reflects physical well-being, and mental component summary MCS, which seizes mental well-being. It comprises eight domains exploring: mental health, role emotional, social functioning, vitality, general health, bodily pain, role physical, physical functioning. The SF-36 total score ranges from 0 to 100 points, with lower score indicating a worst perceived QoL.

The MCS scoring involves positive weights for vitality, social functioning, role emotional and emotional well-being, and negative burden with regard to physical functioning, role physical, bodily pain and general health domains. The PCS scoring comprises positive weights for physical functioning, role physical, bodily pain, general health and vitality scales and negative weights for social functioning, role emotional, and emotional well-being domains. Physical assessment was lead quantifying height, weight and BMI (weight in kilograms divided by the square of height in meters). Metabolic control was detected trough the detection of glycosylated hemoglobin (HbA1c), which reflects the mean blood glucose concentration in the last 3 months (expressed in %). T2DM related outcomes, and specific T2DM pharmacological therapy were acquired from medical history.

2.3 Statistical Analysis

Statistical analysis was performed using IBM SPSS statistical version 25. Descriptive analyzes were performed for both demographic variables and clinical psychological measurements. Clinical psychological variables for TAS-20, HAMA-A, BDI-II, PCS and MCS well normally distributed. Pearson's r correlation was performed to evaluate the relationship between alexithymia, anxiety, depression and perceived quality of life. P values $<.05$ were considered statistically significant.

3. Results

A convenient sample of 47 patients with T2DM diagnosis was recruited for the present study. They all were under oral hypoglycemic metformin treatment, showing a sufficient glycemic control with poor outcomes. Most of the recruited subjects were female and attended the secondary school. Diabetes duration showed a mean value of 11.6 ± 6.7 years. Demographic and physical sample characteristics are summarized in Table 1.

Table 1. Demographic and physical sample characteristics

Variable	<i>Clinical sample</i>
	<i>(n=47)</i>
Gender	M 36.2%
	F 63.8%
Education	Primary school 23%
	Secondary school 59%
	High school or superior 18%
Height (cm)	164.48 ± 9.66
Weight (Kg)	67.46 ± 12.02
T2DM time since diagnosis (yrs)	11.6 ± 6.7
HbA1c (%)	7.1 ± 0.9
T2DM complications	Micro-vascular 15%
	Macro-vascular 15%
Age (yrs)	65.3 ± 5.9
BMI (Kg/m ²)	29.9 ± 5.2

Note. Values are expressed as mean \pm SD. HbA1c = glycated haemoglobin; T2DM= Type 2 diabetes mellitus. BMI= Body mass Index.

With reference to the clinical psychological assessment, participants showed moderate depressive symptoms as confirmed by the mean BDI-II score of 15.14 ± 8.95 and mean HAMA-A score of 24.31 ± 6.95 indicated a high prevalence of anxiety in the enrolled subjects.

It was observed a lower perceived QoL as resulted by the MCS and PCS mean values (37.68 ± 9.41 and 39.31 ± 12.29 , respectively) and TAS-20 highlighted considerable mean values of 60.53 ± 7.93 in the recruited participants with a prevalence in EOT values (27.51 ± 4.27) in comparison with mean DID and DDF mean values (17.26 ± 5.52 and 15.48 ± 3.84 respectively). Clinical psychological measurements are reported in Table 2.

Table 2. Clinical psychological measurements HAMA-A, Beck-II, Tas-20 and Qol variables

<i>Variables</i>	<i>Clinical sample</i>
<i>TAS-20</i>	60.53 ± 7.93
<i>TAS-20- DIF</i>	17.26 ± 5.52
<i>TAS-20- DDF</i>	15.48 ± 3.84
<i>TAS-20-EOT</i>	27.51 ± 4.27
<i>HAMA-A</i>	24.31 ± 6.95
<i>HAMA-A PSY</i>	11.73 ± 3.76
<i>HAMA-A SOM</i>	12.58 ± 4.06
<i>Beck-II</i>	15.14 ± 8.95
<i>SF-36 Physical Component Summary (PCS)</i>	37.68 ± 9.41
<i>SF-36 Mental Component Summary (MCS)</i>	39.31 ± 12.29

Note. Values are expressed as mean ± SD. Tas-20: Toronto Alexithymia Scale-20 Item Version, DIF: Difficulty Identifying Feelings, DDF: Difficulty Describing Feelings, EOT: Externally-Oriented Thinking. HAMA-A: Hamilton Anxiety Rating Scale, HAMA-A PSY: Psychic Anxiety, HAMA-A SOM: Somatic Anxiety. Beck-II Beck Depression Inventory II Version. Physical Component Summary (PCS), Mental Component Summary (MCS), measured by the Short Form-36 Questionnaire.

Pearson's correlation analysis conducted between alexithymia and other variables in T2DM subjects showed a significant high positive association with both psychic and somatic anxiety and a moderate significant association with depression levels. It was also highlighted a significant high negative association between alexithymia and MCS. Particularly TAS-20 DIF was significantly positively high associated with somatic anxiety and inversely with ISM. TAS-20 DDF showed a moderate significant with somatic anxiety. No significant association was detected between TAS-20 EOT and the explored variables. Patients exhibited a high significant positive correlation between HAMA-A, for both somatic and psychic anxiety, and BDI-II. HAMA-A was strongly negatively related with MCS and PCS, particularly psychic a somatic anxiety indicated a moderate inverse association with PCM and a high inverse significant association with MCS. BDI-II revealed a high positive significant association with HAM-A and MCS, while presented a high inverse significant association with MCS. The associations among the observed variables are reported in Table 3.

Table 3 – Pearson correlation coefficients: association among Alexithymia, Anxiety, Depression, Physical Component Summary and Mental Component Summary.

	1	2	3	4	5	6	7	8	9	10
TAS-20	-									
DIF	.627**	-								
DDF	.550**	.100	-							
EOT	.357*	-.285	.105	-						
HAMA-A	.658**	.568**	.368*	.180	-					
HAMA-A	.560**	.330*	.272	.286	.879**	-				
PSY										
HAMA-A	.608**	.666**	.377	.044	.897**	.578**	-			
SOM										
BDI-II	.328*	.305	.152	.078	.602**	.636**	.638**	-		
PCS	-.168	-.170	-.117	.063	-.403**	-.342*	-.372*	-.167	-	
MCS	-.410**	-.504**	-.072	-.024	-.598**	-.538**	-.526**	-.588**	.040	-

Note. Some abbreviations as Tables 1-2. Bold data indicate significant correlations *p < 0.05; **p < 0.001.

Any of the demographic variables was significantly related with metabolic control or disease duration, nor with clinical psychological explored variables.

4. Discussion

It is well known that chronic diseases are often linked to clinical psychological symptoms despite to their specific appearing etiopatogenesis (Conti et al., 2016; Engum, 2007; Whittemore & Dixon, 2008). Several illness are burdened by suffering and psychological symptoms which deeply impact not only QoL (Trikkalinou et al., 2017) but also the specific disease's management (Godsland et al., 1998; Goldbacher et al., 2007; Schmitt et al., 2013), leading to increasing morbidity and mortality, despite individual variability and protective factors (Gargiulo et al., 2019; Kiecolt-Glaser et al., 2002; Palagini et al., 2016). T2DM is one of the most common chronic disease worldwide and it has been highlighted to be often linked to psychological suffering (Das-Munshi et al., 2007; Marchini et al., 2018; Martino et al., 2019a; Sartorius, 2018). The entire complex relative to both psychic and medical crucial aspect involving patient suffering with affect patients' health (Jing et al., 2018; Lapolla et al., 2012; Markle-Reid et al., 2018) and their perceived QoL (Misra et al., 2008; Nguyen et al., 2018).

The aim of this research was to explore the relation between of alexithymia, anxiety and depression symptoms, PCS and MCS, disease duration and metabolic control in T2DM patients.

Our findings suggest alexithymia negatively affects the perceived QoL, concerning above all DIF and MCS respectively, in patients with T2DM. In fact, most of the participants revealed moderate levels of alexithymia, in its three dimensions, which highlight the presence of difficulty identifying feelings, difficulty defining feelings and external oriented cognitive style in patients with T2DM of long duration. On one hand, the high significant correlation between DIF and somatic anxiety, and on the other hand its moderate relationship with psychic anxiety, suggests that difficulty identifying feelings is strongly linked to the presence of anxious somatic expression of emotional status, than psychic anxiety. These data are corroborated by the evidence that DDF is significantly related even to somatic anxiety, which may mean there could exist unconscious mechanisms underlying the prevalent somatic expression of emotional status. At this purpose, we could speculate that what cannot be identified and defined, about feelings, is more easily somatized and expressed through different ways, such as oneiric contents (Settineri et al., 2019a) and mostly by bodily symptoms. It is also true that high inverse association between alexithymia and MCS, could be explained considering that T2DM patients with appreciable levels of alexithymia experience a worst perceived quality of life with reference to vitality, social functioning, role emotional and emotional well-being. We also highlighted that patients with T2DM and higher anxiety levels, showed depression and severe difficulty to both identify and describe feelings, and exhibited a significant worst perceived QoL for both mental and physical health. Furthermore, the strong correlation between alexithymia and all the explored variables, except PCS, is a very interesting data which suggests alexithymia plays a crucial role, together with anxiety, in the perceived QoL of patients with T2DM.

We must acknowledge the present study has some limitations as the small sample size, the cross sectional design and the lack of a control group. Another limitation is represented by the anti-diabetic oral treatment, which on the other side conferred homogeneity to the observed group. The gold standard interview represented a strength of the present study, it allowed us to proceed with the psycho-diagnostic administration without any previous diagnostic bias. Our study may suggest a predictive role of alexithymia in T2DM. Moreover lower PCS and MCS, revealing worst perceived QoL were associated to both higher anxiety and disease duration. These evidences may support psychological intervention strategy aimed at a healthy disease's management and a better QoL, and may encourage patient's assistance, avoiding psychic and somatic complications due to the T2DM.

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