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Illness perceptions and its effect on Anxiety and Symptoms of depression hospitalization- Diabetic patients undergoing lower extremity amputation as a model-

Hamidani moussa* Rahmani Asma

University of Batna 1. Algeria

moussa.hamidani@univ-batna.dz asma.rahmani@univ-batna.dz

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Abstract

The study aimed to reveal the effect of illness perception on Anxiety and Symptoms of depression hospitalization in diabetic patients undergoing lower limb amputation .The sample of the study encompasses randomly selected 32 individuals with Lower Limb Amputation who live in Khenchela .Using the relational descriptive method. The study relied on two measures of the Illness Perceptions Questionnaire (Brief IPQ), and Hospital Anxiety and Depression (HADS) .The study results were as there is a relationship between Sex, economic status, educational level, and cognitive representations with both anxiety and depression. In addition, there is an effect of each of the cognitive representations in combination with age on anxiety, as well as the effect of economic status, educational level, and gender on depression. Based on these results, we recommend building treatment plans and programs to improve the nature of Illness perceptions and try to reduce the symptoms of anxiety and depression in diabetic patients undergoing lower limb amputation.

Keywords:

Illness perceptions; Anxiety; depression; diabetes; lower limb amputation.

* Corresponding author

Introduction:

The emergence and development of chronic illness drew the attention of many researchers in the field of health in general and health psychology in particular, The latter has recently emerged, which is defined "This is an exciting and relatively new field devoted to understanding the psychological impact on how people stay healthy, why they get sick, and how they react when they get sick ." Health psychologists study such issues and develop interventions to help people stay healthy or recover from illness. (TAYLOR, 2015, p6)

Health psychology bases its explanation of the phenomenon of health and illness on the biopsychological model which emphasizes both health and illness. The view is that biological, psychological, and social factors are all involved in any given state of health or illness. (TAYLOR, 2015, p316)

In advanced diseases such as diabetes, peripheral arterial disease, oncological disease, trauma or infection, amputation is often an unavoidable procedure and has a huge impact on the patient's life. The incidence of amputation varies between 1.2 and 4.4 per 10,000 inhabitants in different countries, and most are performed in the lower limbs (up to 90%). It is estimated that these numbers could double by 2050. (Holzer et al, 2014, p01)

In Algeria, the National Federation for the Assistance of People with Diabetes has counted two hundred thousand (200,000) diabetics in Algeria who are at risk of having one of their lower limbs amputated due to diabetic foot ulcers. (www.elbilad.net)

Amputation results in some limitations in the performance of professional, recreational, and social activities. It disrupts the integrity of the body and reduces quality of life (QoL) through reduced mobility, pain, and reduced body integrity. Patients are affected psychologically and socially. Mental health problems include depression, anxiety, and in severe cases, suicide. Loss of body parts can also affect a person's perception of their body and its appearance.

(Holzer et al, 2014, p01)

Illness cognition includes perceived causes, consequences, identity (name and symptoms), timeline, emotional responses, coherence, and personal and treatment control. Patients develop goals to cope with health threats and/or related emotions. Take action to reduce the threat itself or the emotions associated with it. (Masseyet al, 2013, p 229)

In the context of Limb amputation, the perception of physical attractiveness is a complex construction of various psychological and physical factors. A person’s physical traits are considered aesthetically pleasing or beautiful to the degree. (Adamson & Galli ,p 2003)

Body image is a person's perception of their own body and is a multidimensional, **dynamic** process that is influenced by internal factors such as age, gender, and physical condition, as well as external factors such as social or environmental factors. (Holzer et al, 2014 ,p 01)

The destruction of body image is the result of social values that emphasize vitality, appearance, and fitness. Therefore, amputation can be seen as a sign of failure. Amputees must adapt physically, socially, and psychologically to changes in structure, function, and body image. There is a paucity of data in the literature on body image in post-amputation patients. Self-esteem is a positive or negative orientation toward oneself: an overall assessment of a person's worth or worth. Self-esteem includes beliefs and emotions such as victory, despair, pride, and shame. (Holzer et al, 2014, p 01)

Losing a limb is devastating and requires major life adjustments. In addition to losing limbs, patients also lose self-esteem, social interaction, job prospects and independence. In fact, the psychological adjustments required are comparable to those required to cope with bereavement, so it is not surprising that symptoms of anxiety or depression are common after amputation. Several studies confirm this, with prevalence rates as high as 41%. 2–5 surprisingly, several studies have shown that depression levels remain elevated up to 10 years

later; 6–8 if readjustment after amputation is similar to adaptive responses after bereavement, it is not this circumstance occurs. Intense fear and grief reactions have also been reported after amputation but levels fall quickly afterwards. (Singh et al, 2007, p754)

Anxiety and depressive symptoms are more common in people with diabetes than in the general population, 1 and among diabetes complications such as diabetic foot ulcers (DFU), some studies have reported the negative impact of high anxiety and depression on adverse disease outcomes. 2- 5 Empirical evidence suggests that this relationship is bidirectional. On the one hand, anxiety and depression are particularly detrimental to self-care behaviors and are associated with poorer diabetes control and poorer compliance with medications, diet, and foot self-care behaviors. (Pedras et al, 2017, p 80)

The purpose of this study was to examine the effect of Illness perceptions on Anxiety and Depression symptoms in diabetic patients undergoing lower limb amputation. The questions of this study are:

- Is there a relationship between illness perception with anxiety and depression symptoms in diabetic patients undergoing lower limb amputation?
- Is there an effect of illness perception on anxiety and depression symptoms in diabetic patients undergoing lower limb amputation?

1. Hypothesis:

- There is a statistically significant relationship between illness perception and anxiety and depression symptoms in diabetic patients undergoing lower limb amputation.
- There is a statistically significant effect of illness perception on anxiety and depression symptoms in diabetic patients undergoing lower limb amputation.

2. The importance of the study:

The importance of the study from a theoretical point of view lies in the fact that it is new, as it is concerned with the category of diabetic patients undergoing amputation of one of the lower limbs, while studying it with two of the most important variables in health psychology, which are perception of illness, anxiety, and hospitalization depression. As for the practical aspect, its importance is evident through the results it produces. The current study attempts to develop therapeutic education programs by the health care team for the benefit of patients undergoing amputation of one of the lower limbs in order to preserve their physical and psychological health on the one hand, and also opens the way for researchers in the field of health psychology to expand further on this topic given its importance, especially in our current time.

3. Aim of the Study:

The aim of the study is:

- Trying to detect the presence of the relationship between illness perception with anxiety and depression symptoms in diabetic patients undergoing lower limb amputation.
- Trying to detect the presence of the effect of illness perception on anxiety and depression symptoms in diabetic patients undergoing lower limb amputation.

4. Terminology:

4.1 Illness Perception:

It is the total score obtained by a diabetic patient undergoing a lower limb amputation on Brief Illness Perception Questionnaire (B-IPQ). Which we use in this study.

4.2 Hospital Anxiety and Depression:

It is the total score obtained by a diabetic patient undergoing a lower limb amputation on Hospital Anxiety and Depression Scale (HADS). Which we use in this study.

5. Theoretical Framework of the study:

5.1 Illness perception

Illness perception is a concept that has entered the field of meaning theory (common sense model), especially in the field of cognitive Illness perception by researcher Eventhal in 1980. He believed that Illness perception provides individuals with various personal characteristics to convey beliefs in order to The process of giving meaning to a disease, disease perception occurs during diagnosis or when a patient experiences unusual symptoms so that the patient understands his new condition after getting all the information and sources about him Conditions He uses filtering methods to prepare information about his surgery vision of Illness. (Pupat, 2007, p 21)

The common sense model (CSM) of self-regulation in health and illness (Leventhal, Nerenz, & Steele, 1984) provides an explanation for the different behavioral and emotional responses to chronic diseases such as CKD. According to this model, people identify health threats by developing their own cognitive and affective perceptions (i.e., beliefs) about health threats. These perceptions then guide coping behaviors, which in turn determine outcomes, including quality of life (Hagger & Orbell, 2003; Moss-Morris et al., 2002).

The model was developed to explore how people express Illness. Specifically, the model aims to identify Illness manifestations, its interactions with adaptations, and its relationship to health behaviors and outcomes.

- The theory is based on three basic postulates:

- the individual is an active agent in reducing the difference between their current and ideal state of health.
- Cognitive representations of illness guide the adoption and evaluation of action plans.
- The representation of the threat is unique and does not necessarily meet medical standards.

- The model envisions the illness management process as divided into four stages:

- Gather information about the disease,
- Manifestations of disease.
- Plan preventive measures .
- Result evaluation. This work will focus on the second phase, the manifestation of the disease. This is influenced by the precision and quantity of knowledge gained from external information, internal information related to somatic events, and past illness experiences.

- Individuals build their representation on five key components:

- Identity is a label (e.g. angina) associated with a disease and accompanying symptoms (e.g. chest pain).
- the illness timeline, i.e. H. Expectations regarding the duration of the disease and its course (acute, periodic or chronic condition),
- Consequences, i.e. the expected effects of the disease and the after-effects due to the disease (direct, long-term, social or physical consequences),
- Causes, i.e. H. ideas about how the person got the disease (causal attribution) and finally.
- Control/ cure, i.e. H. A sense of control over the development or outcome of a disease. Note that sense of control includes personal efficacy, outcome expectations, and the ability to appropriately manage health behaviors. (JANELLE, 2010, p13)

5.2. Anxiety and Symptoms of depression hospitalization in patients undergoing amputation:

Anxiety and depression are two of the most common mental illnesses that co-occur with other mental illnesses, physical illnesses, and each other. It is often difficult to distinguish between these disorders due to the high rate of comorbidity, the degree of symptom overlap, and the inextricable links between the symptoms of these disorders

They are often very difficult to differentiate. However, the Hospital Anxiety and Depression Scale (HADS) was created specifically to accomplish this task and to assess possible and probable cases of anxiety and depression in non-psychiatric hospital outpatients. The HADS is an important psychometric tool in the assessment of individuals with somatic illnesses.

5.2.1. Anxiety

Mild to moderate anxiety is normal after an amputation and during hospitalization. Anxiety reactions may occur as patients become aware of the loss of a limb and evaluate the impact and consequences of amputation. An unfamiliar hospital environment, frequent contact with medical staff, painful treatment procedures, feelings of loss of control, and uncertainty about the future can all increase anxiety. Anxiety may also be caused by concerns or fearful reactions to changes in abilities when rearranging family roles or preparing to return to work. (Hye Jo et al, 2021, p196)

5.2.2. Depression:

Approximately 21-35% of amputees suffer from depression, which is higher than the 10-15% of the general population. Depression is influenced by individual premorbid functioning and perceived helplessness. Additionally, patients with a history of major depressive disorder may experience depressive symptoms following amputation. Risk factors for major depression include young age, pain, neurotic personality, and maladaptive coping skills. Depression impairs recovery and adjustment; therefore, mood and adjustment levels should be appropriately assessed at each critical period. Normal sadness reactions and hypoactive delirium can lead to depression; therefore they must be distinguished.(Hye Jo et al,2021,p196)

6. The method of the study:

We relied on the descriptive, correlational approach because it serves the objectives of the study.

7. Participants

A sample of 32 persons having diabetes and undergoing lower limb amputation, the patients lived in Khenchela. All patients can read and write the Arabic language and have a medical diagnosis of their condition to be included in the study. All eligible patients who attended the clinic were invited to participate. The characteristics of the patient sample are presented in Table 1.

Table1. Sample socio-demographic and clinical characteristics (N=32)

Variables		N	٪
Sex	Men	18	56.3
	Women	14	47.7
Age	40-60	16	50
	61-90	16	50
Marital Status	Married	28	87.5
	Widowed	4	12.5
Education level	Illiterate	18	56.3
	Primary school	4	12.5
	middle school	6	18.8
	high school	4	12.5
Economical Status	Weak	14	43.8
	Medium	14	43.8

	Good	4	12.4
since Time Amputation	months ≥ 2	22	68.8
	months≤ 2	10	31.2

8. Measures

8.1. Brief Illness Perception Questionnaire. (B-IPQ)

The nine-item Brief Illness Perception Questionnaire (BIPQ) was employed to assess illness perception. The BIPQ contains eight items evaluating the cognitive and emotional representations of illness, including consequences, timeline, personal control, treatment control, identity, coherence, causes, and emotions, with Cronbach's coefficients of 0.86. Items are scored from 0 to 10. The last item is an open-ended question asking respondents to list three causal factors. A total score of illness perception was calculated as the sum of the 8 items. (Jiarui Li et al 2020:01).

Psychometric properties of the scale:

- **Reliability:**

Table 02: Reliability of the Brief Illness Perception Questionnaire (BIPQ)

Statistiques de fiabilité	
Alpha de Cronbach	Nombre d'éléments
0.56	8

- **Validity :**

Table 03: Validity of the Brief Illness Perception Questionnaire (BIPQ)

Dimensions	Item	Pearson Correlation Coefficient
Cognitive representations	1	0.72**
	2	0.70**
	3	0.35*
	4	0.50**
	5	0.51**
emotional representations	6	0.81**
	8	0.60**
Understanding the illness	7	1.00**

Pearson correlation coefficient * p < 0.05; ** p < 0.01

8.2. Hospital Anxiety and Depression (HADS)

The HADS questionnaire includes 7 items that reflect anxiety and 7 items that reflect depression. Each item is scored on a scale of 0‑3 points. The total score for the questionnaire ranges from 0 to 21. Scores of 0‑7 are considered "normal," 8‑10 "borderline" and above 10 represent a mood disorder. (Kalender et al 2018:963)

Psychometric properties of the scale

- **Reliability:**

Table 04: Reliability of the Hospital Anxiety and Depression (HADS)

Statistiques de fiabilité	
Alpha de Cronbach	Nombre d'éléments
0.87	14

- **Validity:**

Table 05: Validity of the Hospital Anxiety and Depression (HADS)

Dimensions	Item	Pearson Correlation Coefficient
Anxiety	A1	0.78**
	A3	0.88**
	A5	0.87**
	A7	0.40*
	A9	0.80**
	A11	0.64**
	A13	0.78**
Depression	D2	0.67**
	D4	0.86**
	D6	0.59**
	D8	0.53**
	D10	0.49**
	D12	-0.19
	D14	0.77**

**** p ≤ 0.01**

9. Results

Table 06: Correlation between dimensions of illness perception and sociodemographic factors, with Hospital Anxiety and Depression

Variables	Anxiety	Depression
Sex	0.06	-0.14
Age	-0.34	-0.32
Economical Status	-0.59**	-0.53**
Education level	-0.47**	-0.37*
Marital Status	0.21	0.19
Time since amputation	0.06	0.03
Cognitive representations	-0.73**	-0.44*
Emotional representations	0.12	0.06
Understanding the illness	0.02	0.04
Anxiety	1	0.80**
Depression	0.80**	1

Pearson correlation coefficient * p < 0.05 ; ** p < 0.01

- There is a negative relationship between economic status and Anxiety by (-0.59) at the level of significance (0.01), and a negative relationship between economic status and depression by (-0.53) at the level of significance (0.01).

- There is a negative relationship between Education level and Anxiety by (-0.47) at the level of significance (0.01) and a negative relationship between Education level and depression by (-0.37) at the level of significance (0.05).
- There is a negative relationship between cognitive representations and Anxiety by (-0.73) at the level of significance (0.01), and a negative relationship between cognitive representations and depression by (-0.44) at the level of significance (0.05).
- There is a positive relationship between Anxiety and depression by (0.80) at the level of significance (0.01).

Table 05: Represents the effect of illness perception dimensions and sociodemographic factors on hospitalization anxiety and depression

Table: Regression analysis in predicting Hospital Anxiety and Depression

dependent variable	predictor variable	R	R2	F	SIG	BETA	BETA
Anxiety	cognitive representations	0.73	0.54	35.21	0.00	-5.93	-0.73
	cognitive representations	0.88	0.75	35.21	0.00	-9.17	-0.82
	Age					-5.49	-0.49
Depression	Economical Status	0.53	0.29	12.32	0.01	-3.49	-0.53
	Economical Status	0.64	0.41	10.35	0.00	-3.71	-0.52
	Education level					-2.51	-0.35
	Economical Status	0.72	0.52	10.38	0.00	-3.90	-0.50
	Education level					-3.61	-0.53
	Sex					-2.54	-0.37

In order to find out the effect relationship between illness perceptions, Anxiety, and Depression symptoms in diabetic patients undergoing lower limb amputation, a multiple linear regression model «step by step", was used to find out the possibility of the effect of the dimensions of illness perception, and sociodemographic variables, as well as clinical variables on the Anxiety and Depression symptoms, It was found through the results of the analysis that:

- The cognitive representations affect Anxiety, where the value of (R2 = 0.54), where the value of (SIG = 0.00), where the value of (F = 35.21), which is statistically significantly less than (0.05).
- The cognitive representations in conjunction with Age affect the Anxiety, where the value of (R2 = 0.75), where the value of (SIG = 0.00), where the value of (F = 35.21), which is statistically significantly less than (0.05).
- Economical Status affect the Depression, where the value of (R2 = 0.29), where the value of (SIG = 0.01), where the value of (F = 12.32), which is statistically significant less than (0.05).

- Economical Status in conjunction with Education level affects the Depression, where the value of (R2 = 0.41), where the value of (SIG = 0.00), where the value of (F = 10.35), which is statistically significantly less than (0.05).
- Economical Status in conjunction with Education level and sex affects Depression, where the value of (R2 = 0.52), where the value of (SIG = 0.00), where the value of (F = 10.38), which is statistically significantly less than (0.05).

10. Discussion

10.1. Discussion of the results of the first hypothesis:

- There is a negative correlation between the economic situation and each of anxiety and depression، meaning that the lower the economic level of the patient who had one of his limbs amputated, the higher the level of anxiety and depression, it is a logical result, as the economic level of the patient who had one of his lower limbs amputated led to his inability to provide for his basic needs such as treatment, food...etc, which raises his level of anxiety and depression . This is consistent with the results of a study that revealed that the prevalence of (Ali, 2018) In our two-state conflict zone, the prevalence of anxiety disorders is 32% and the prevalence of depressive symptoms is 23%. Factors associated with higher rates of psychological symptoms include unmarried young women, lower socioeconomic status, being a single breadwinner, lack of social support, unemployment, and traumatic amputation. These results were confirmed by significantly lower anxiety and depression scores in patients who received social support, patients with disease-related amputation, and patients with above-the-knee amputation. (Ali et al ,2018,p 892)
- There is a negative correlation between the educational level and of anxiety and depression, meaning that the lower the educational level of the diabetic patient whose leg is amputated, the more unclear the identity of the disease in terms of its nature, symptoms, causes, and consequences. Medications in an unregulated and controlled manner lead to a decrease in treatment control and non-adherence to it, and consequently, an increase in the emergence of psychological complications, the most important of which are anxiety and depression, which negatively affect the patient's quality of life, and this is consistent with the study of (Mohamed and Shebl, p 2014). The results of this study showed that most participants observed changes in quality of life. There were statistically significant differences between the overall aspects of quality of life and the following factors: age, gender, education level, and type of work. (Mohamed and Shebl,2014,p 01)
- There is a negative relationship between cognitive perceptions and both anxiety and depression, meaning that the patient who has positive health beliefs and receives detailed information about his health status and the effective method of treatment will increase his health awareness, so he will have a clear picture of his new health condition after amputation. This will reduce the level of anxiety and depression. This is consistent with the results of a study by Gozaydinoglu et al (2019), which showed that There is a statistically significant relationship between an individual's body image perception and cognitive performance. Body image perception was significantly and negatively correlated. (Gozaydinoglu et al ,2019,p 221)
- There is a positive relationship between anxiety and depression in diabetic patients who have had one of their legs amputated, meaning anxiety accompanies a high level of depression, which is an expected and logical result. It was found that the average levels of anxiety and depression were 9.10±5.7 and 3.44±3.42 respectively. Length of initial hospitalization, number of available visits, number of admissions, number of follow-up visits per year, family type (nuclear family vs. joint family), pain perception, optimism, lower satisfaction with recovery and amputation Extremities were significantly associated

with anxiety levels in patients. Depression levels are only significantly related to pain perception. (Bhutani et al,2016,p 09)

10.2. Discussion of the results of the second hypothesis:

- Cognitive representations associated with age have an impact on the level of anxiety, as we can predict that patients who have had one of their lower limbs amputated have negative cognitive representations in the sense that they do not have a clear vision of their health status and do not know the identity of their disease and the health complications that this disease leaves behind and the capabilities it requires to control Personal health status has an impact on their high level of anxiety and in this context we find a study whose results showed that in a large self-regulated common sense regression model (CS-SRM) for predicting prosthetic use, periodicity (perception of symptom fluctuations) and treatment control (beliefs in treatment effectiveness) were the most influential Variables. Their effects were stronger at 6 months of age than at 1 month of age. The same variables affected first- and sixth-month activity restriction forecasts. (CALLAGHAN et al 2008, p 324)
- It also showed that the age factor has an impact on the level of anxiety, the smaller the patient whose lower limb was amputated, the greater his level of anxiety, because this disability is an obstacle to achieving his goals and ambitions and this is what was proven by a study of ASANO et al in 2008, which revealed the analysis of seven important factors (Depression, perceived artificial mobility, social support, comorbidity, prosthetic problems, age and participation in social activity) as predictors of people's perceived quality of life. Depression explained 30% of the variance, while the full model explained 42% of the variance. (ASANO et al, 2008, p 231)
- The economic situation associated with the level of education and gender affects depression, meaning that the lower it is The economic level of the patient and his educational level was low whenever it negatively affected the quality of their life and thus the level of depression would rise and this is consistent with the study of Sinha et al (2011). He also confirmed that people with amputations at or above the knee had a significantly lower quality of life. According to them, patients after femoral amputation have a poorer quality of life compared with the general population (Sinha et al 2011, p 90). Physical manifestations after amputation depend largely on age, as also shown by Sinha et al. People over 65 showed lower physical function than younger patients. However, no significant differences were found between these groups in psychological performance, social role playing, **economic** status, and physical symptoms. (Grzebień et al ,2017,p 58)

Conclusion:

By presenting the subject of the study, which is the illness perception and its effect on the symptoms of hospitalization anxiety and depression among diabetic patients undergoing lower limb amputation as a model, which started from the study of the illness perception variable with an attempt to reveal its impact on the symptoms of hospitalization anxiety and depression, and through this study, it was reached:

- There is a relationship between Sex, economic status, educational level, and cognitive representations with both anxiety and depression.
- There is an effect of each of the cognitive representations in combination with age on anxiety, as well as the effect of economic status, educational level, and gender on depression.
- As for the assessment of causal representation in renal transplant patients, which is known through the Brief Illness Perception Scale, it was found that for patients whose

lower limbs had been amputated as a result of diabetes, most of their answers focused on genetic factors, psychological stress and anxiety, and lifestyle.

The negative perception of the patient's health status, especially his low level of understanding of his illness, negative cognitive representations, as well as his erroneous thoughts and beliefs about lower organ amputation, all of this negatively affects his level of anxiety and depression.

Therefore, it must be emphasized the importance of the health care team understanding the patients' perceptions of patients who have had one of their lower limbs amputated as a result of diabetes, and trying to know how they perceive it, to interact with them and help them meet their needs better and thus enable the patient to achieve better psychological and social adjustment in a way.

Based on these results, we suggest:

- Attempting to prepare specialized treatment programs aimed at raising health awareness for diabetic patients who have had one of their lower limbs amputated, would help achieve better mental health.
- Involving a diabetic who has had one of their lower limbs amputated in the treatment plan by the health care team to improve the treatment process.
- Organizing training courses for health professionals on biological, psychological, and social factors and their impact on diabetic patients who had one of their lower limbs amputated, and encouraging them to better adapt to the new health situation after amputation.
- Encouraging interest in taking care of the psychological aspect of chronic patients in general and patients who have had one of their lower limbs amputated in particular from subjecting them to psychological treatment on the one hand, and carrying out awareness campaigns to raise awareness among individuals about the importance of mental health.

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