Self-Care Behavior and Performance Level Associated with Algerian Chronically Ill Patients

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Abstract—Chronic illnesses affect many Algerians. It is possible to investigate the impact of illness representations and coping on quality of life and whether illness representations are indirectly associated with quality of life through their influence on coping. This study aims at investigating the relationship between illness perception, coping strategies and quality of life with chronic illness. Illness perceptions are indirectly associated with the quality of life through their influence on coping mediation. A sample of 316 participants with chronic illness living in the region of Batna, Algeria, has been adopted in this study. A correlation statistical analysis is used to determine the relationship between illness perception, coping strategies, and quality of life. Multiple regression analysis was employed to highlight the predictive ability of the dimensions of illness perception and coping strategies on the dependent variables of quality of life, where mediation analysis is considered in the exploration of the indirect effect significance of the mediator. This study provides insights about the relationship between illness perception, coping strategies and quality of life in the considered sample ($r = 0.39$, $p < 0.01$). Therefore, it proves that there is an effect of illness identity perception, external and medical attributions related to emotional role, physical functioning, and mental health perceived, and these were fully mediated by the asking for assistance ($c' = 0.04$, $p < 0.05$), the guarding ($c' = 0.00$, $p < 0.05$), and the task persistence strategy ($c' = 0.05$, $p < 0.05$). The findings imply partial support for the common-sense model of illness representations in a chronic illness population. Directions for future research are highlighted, as well as implications for psychotherapeutic interventions which target unhelpful beliefs and maladaptive coping strategies (e.g., cognitive behavioral therapy).

Keywords—Chronic illness, coping, illness perception, quality of life, self-regulation model.

I. INTRODUCTION

AN increasing number of Algerians are affected by chronic health conditions. People with a chronic health condition often have to face a broad range of problems related to their situation; consequently, there is a growing interest in identifying factors that influence people's health-related quality of life in a positive, as well as in a negative way. The individuals' ways of life and the never-ending advances in health care will continue to have a major influence on health and overall well-being and will result in an increase in the incidence and prevalence of chronic illnesses. Because many

chronic conditions are rarely linked to a specific cause, they are managed but not cured. In Algeria, 20 million people currently live with one chronic condition [1]. Chronic illnesses are now the leading cause of death and disability in developed countries and their prevalence is increasing as the population ages [2], [3]. With the advances that have occurred in health care technology, research regarding chronic illness has changed from identification of measures that will extend life to the development, testing, and implementation of measures to support health-related quality of life. Individuals with both acute and chronic illnesses are taking a more active role in their health care and expect their beliefs regarding their illness to be considered in medical consultations and selection of treatment [4]. In order to interpret and respond to the wide variety of problems encountered when dealing with a chronic illness, individuals create their own models or representations of their illness [5]. These representations include factors such as chronicity, consequences, and severity, and subsequently determine the coping strategies that are used both directly and indirectly to deal with the illness. It is evident that an individual's representation of the chronic illness guides the development and achievement of goals and the evaluation of the outcomes of coping strategies. As well, quality of life may be related to these cognitive representations of illness and treatment [6]. A lack of congruity between the healthcare practitioners and the patient's beliefs regarding the cause of the chronic illness and subsequent management can impact the psychological and physiological outcomes of their disease process [7]. Many researchers had identified a relationship between the patient's perception of illness and quality of life [8]-[11]. For example, in a sample of patients with chronic fatigue syndrome, Gray and Rutter found support for mediation whereby the outcome quality of life was mediated by the coping strategy 'maintaining activity for physical functioning' [12]. Evidence supporting mediation was also reported by Rutter and Rutter in their study of irritable bowel syndrome [13]. For example, when looking at the outcome depression, the cure/control illness representation was found to be mediated by the coping strategy of behavioral disengagement. Partial support for mediation has also been reported in chronic conditions such as diabetes [14], rheumatoid arthritis [15] and epilepsy [16]. However, mediation was not supported by Kaptein et al., in their study examining Leventhal's common sense model (CSM) in patients with Huntington's disease [17]. Alternatively, they found evidence for a direct effect of illness representations on psychosocial outcome. The notion that illness representations exert a direct influence on outcome is well supported in the

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literature [16], [18], [19], and some authors argue that this relationship better fits the data on illness representations and outcome than one whereby coping plays a mediating role [20], [21]. A definition that describes both the physical and psychological components of chronic illness is appropriate. Han et al. [22] define chronic illness as "a state of disease with irrevocable pathological change, lasting for more than three months and eventually causing permanent disability". Germino further describes chronic illness as unremitting, persisting over time, pervading all aspects of life, and having a trajectory that varies in its predictability and controllability. Chronic illness is continuous and without a predictable resolution [23]. Dealing with the transition from diagnosis to treatment and management of a chronic illness can be difficult. Chronic illness has a significant impact on the quality of life of affected individuals and the range of problems experienced varies greatly from one to another [24], [5]. The purpose of this study was to examine the relationship between illness representation and quality of life mediated by coping strategies. This paper highlighted an illustration theory and research on chronic illness and has examined the relationships between components of the CSM. The CSM explicitly links all three components in a meditational model. That is, illness representations are directly related to coping and, via coping, to adaptive outcomes such as psychosocial adjustment and quality of life. Coping is assumed to mediate between illness representations and adaptive outcome [25], in order to consider both the empirical value and further knowledge regarding the importance of psychotherapeutic interventions in chronic illness.

II. METHODS

A. Participants

We have analyzed a sample of 316 persons having chronic illness, 48.73% women. The majority of the participants were married (53.8%), 3.8% were divorced, and 36.08% were never married. Concerning education, 22.78% of the participants reported never having attended school, 14.56% said they achieved primary school, 27.21% had middle school level, 25.32% were secondary school graduates, and 10.12% had higher education. The majority of the participants had median economic level (75.32%). Four illness groups have been created from the regions of Arris and Batna, Algeria. All patients were able to read and write in Arabic and had 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 four illness groups are presented in Table I.

III. MEASURES

A. The Illness Perception Questionnaire Revised (IPQ-R) (Predictor)

The IPQ-R consists of three subscales, the illness identity scale, causal attributions scale and 38-item IPQ-R scale. The illness identity scale presented in the first position which include 12 commonly experienced symptoms like pain,

nausea, breathlessness, weight change, fatigue, headaches, upset stomach, etc. The causal attribution scale presented as an independent section which uses the 5-point Likert-type scale: strongly disagree, disagree, neither agree, nor disagree, agree, and strongly agree. The number of attributional items was extended from 10 to 18 [26]. In the last section, the 38-item IPQ-Rare is rated on the same 5-point Likert type scale. These subscales had adequate internal consistency in the prior study of the Arabic version [27].

TABLE I
CHARACTERISTICS OF PATIENT SAMPLES

Illness Group	N	Gender (% Male)	Length of Illness Mean (SD) years	Age Mean (SD) years
Asthma	62	63.3	10.90(10.03)	40.73(13.98)
Diabetes	74	64.6	5.64(4.96)	45.29(16.02)
HBP	82	36.5	10.09(7.38)	55.17(14.07)
Chronic Kidney disease	98	60	6.46(5.63)	35.62(11.96)

B. Short-Form 36 Health Survey Version 2.0 (SF-36v2) (Outcome)

Short-Form 36 Health Survey Version 2.0 (SF-36v2): The SF-36v2 is a multipurpose health survey that measures overall health status, functional status, and health-related quality of life.

- The survey produces eight scale scores: Physical Functioning (PF), Role Physical (RP), Bodily Pain (BP), General Health Perceptions (GH), Vitality (VT), Social Functioning (SF), Role Emotional (RE), and Mental Health (MH).
- Two summary scales can be used: Physical Component Score (PCS), which combines PF, RP, BP, and GH; and, Mental Component Score (MCS), which combines VT, SF, RE, and MH [28]. These subscales had adequate internal consistency in the present sample (Cronbach's alpha ranging from 0.50 to 0.89).

C. The Chronic Pain Coping Inventory (CPCI-42) (Mediator)

The CPCI-42, by Jensen et al., 1995, is a 65-item; self-report questionnaire that requires patients to choose several behavioral and cognitive strategies used to cope with pain. These strategies are divided into eight subscales that include guarding, resting, asking for assistance, relaxation, task persistence, exercise/stretch, seeking social support, and coping self-statements. The subscales had high internal consistency, test–retest reliability, and concurrent validity in a sample of chronic pain patients [29]. The CPCI, a 42-item abbreviated version of the CPCI, had good psychometric properties [30]. The Chronic Pain Coping Inventory-42 (CPCI-42) was validated in a group of patients with chronic illness in the present study and these sub scales had adequate internal consistency in the present sample (Cronbach's alpha ranging from 0.74 to 0.78).

IV. DATA ANALYSIS

All statistical analyses were performed with SPSS software, statistical methods were based on Pearson's correlation's

coefficient to calculate the relationship between the various dimensions and linear multiple regression analysis (stepwise) to find the values of the mediator the analysis of another so-called mediation analysis, which was prepared by [31]. This test is used in the field of psychology in the form of 'causal steps strategy', first used by Kenny and Barron in 1986, and is calculated by the electronic network in the program prepared by [32], [33], by intervention regression analysis, as summarized by the following steps (see also Fig. 1):

- The first step: The independent variable (illness perception) directly affects on the dependent variable (quality of life) without the presence of the mediator (coping).
- Step Two: The independent variable (illness perception) directly affects on the mediator (coping).
- The third step: The mediator variable (coping) indirectly affects the independent variable (illness perception) on the dependent variable (quality of life).
- The final step: The independent variable (illness perception) directly affects on the dependent variable (quality of life). This track does not vary significantly from zero [9], [33]. Fig. 1 illustrates the hypothesis model.
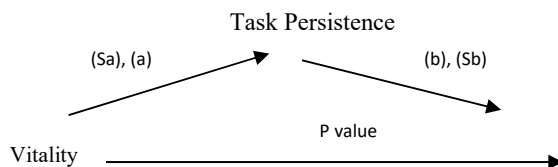

Fig. 1 Mediation Analysis Model

a = raw (unstandardized) regression coefficient for the association between IV and mediator. s_a= standard error of a. b = raw coefficient for the association between the mediator and the DV (when the IV is also a predictor of the DV). s_b = standard error of b.

V. RESULTS

The results indicated that a prediction of the quality of life through illness perception is mediated by coping strategies and selected among the members of the sample, where the extracted correlation coefficients, helps in the mediator analysis as well as a series of regression analysis to find a forecasting dependent variable (quality of life) through two independent variables (illness perception and coping strategies). We computed each of the transactions, the raw coefficient (a and b), as well as the standard error for each coefficient (Sa and Sb), and this in every step of the regression analysis yielded 19 models after applying the Sobel test results, as shown in Table II. Based on the results of this table, we took into account only six models expressing the predictability of the quality of life through illness perception after the selection of the coping strategies. These models are:

- Prediction of the emotional role through its identity illness after choosing the asking for assistance with chronic illness patients (c'= 0.04, p < 0.05).
- Prediction of the emotional role through its illness identity after choosing the guarding strategy with chronic illness (c'= 0.00, p < 0.05).
- Prediction of the physical role through the external attributions after choosing the asking for assistance with chronic illness patients (c'= 0.00, p < 0.05).
- Prediction of the physical functioning through the medical attribution after choosing the task persistence strategy (c'= 0.05, p < 0.05).
- Prediction of the emotional role through the external attributions after choosing the asking for assistance with chronic illness (c'= 0.00, p < 0.05).
- Prediction of the perceived mental health of the patient through the external attribution after choosing the task persistence strategy with chronic illness (c'= 0.01, p < 0.05).

TABLE II
SOBEL TEST RESULTS

(IV)	(Mediator)	(DV)	(Sb)	(b)	(Sa)	(a)	(c'value)
Biological attributions	Task Persistence	Vitality	0.04	0.21-	0.16	0.26-	0.87
Identity	Asking for Assistance	Role Emotional	0.08	0.32-	0.07	0.17	**0.04**
Identity	Guarding	Role Emotional	0.06	0.22-	0.01	0.47	**0.00**
Identity	Exercise/Stretch	Role Emotional	0.06	0.12	0.10	0.05-	0.65
External attributions	Guarding	Role Emotional	0.06	0.23-	0.09	0.17	0.08
External attributions	Exercise/Stretch	Role Emotional	0.06	0.13	0.09	0.02-	0.86
External attributions	Guarding	Role Physical	0.07	0.22-	0.09	0.17	0.09
External attributions	Asking for Assistance	Role Physical	0.08	0.31	0.07	0.29-	**0.00**
External attributions	Coping Self-Statements	Role Physical	0.09	0.29-	0.02	0.08	0.22
External attributions	Exercise/Stretch	Role Physical	0.06	0.28	0.09	0.02-	0.86
Medical attributions	Task Persistence	Physical Functioning	0.30	0.75	0.06	0.19-	**0.05**
Medical attributions	Exercise/Stretch	Physical Functioning	0.09	0.50	0.07	0.02	0.76
Medical attributions	Guarding	Physical Functioning	0.09	0.08-	0.06	0.28	0.50
Biological attributions	Asking for Assistance	Physical Functioning	0.10	0.85	0.16	0.03-	0.87
Biological attributions	Exercise/Stretch	Physical Functioning	0.09	0.50	0.18	0.10	0.58
Biological attributions	Guarding	Physical Functioning	0.11	0.25-	0.17	0.32	0.15
External attributions	Asking for Assistance	Role Emotional	0.00	0.27-	0.05	0.26	**0.00**
External attributions	Asking for Assistance	Mental Heath	0.07	0.27-	0.06	0.26	**0.01**
Behavioral attributions	Asking for Assistance	Mental Heath	0.07	0.29-	0.12	0.15	0.27

Significant total indirect effect (c'), p < 0.05.

VI. DISCUSSION

A negative relationship between the *illness identity* and the *emotional* and *physical role* was noticed. Abuse as the chronic illness requires permanent changes in physical and social activities, and therefore patients have in such cases to unite with the psychological point if they want to cope with their disorder. For this, we found that there is a diagnosis after illness chronicity where the patient's response represented in the psychological imbalance and the accompanying physical and social failure to face the illness. This is what is observed through the study of the negative relationship between the illness perception and the lack of quality of life in all its dimensions, almost as well as attributing the patient for reasons beyond him and this is what explains the adoption of the patient on the unconscious mechanism with the onset of the disease and the adoption of *denial* mechanisms, *anxiety* or *depression* in some types of the illness. Instead of conscious mechanisms, where the patient avoids the fact that the disease has been acting and the disease will go away, and he feels helpless, a lasting sense of symptoms and constant vigilance; however, the depression is a transient period that often appears in the late stages of adaptation. The beliefs held by the patient regarding his awareness of the causes of the disease and his perceived control, where he expects many issues and pressures, can result in the manifestation of physical impairment, and usually ends with fatalism and the will of God. While self-blame is common in patients, it is often attributed to other causes such as genetics.

A negative relationship is clear between illness perception (*external attribution* and *psychological attributions*) and coping, especially with regard to *guarding* and *task persistence*, in addition to *asking for assistance* that explain the former expressions related to the lack of conscious mechanisms of the patient at the beginning of the illness. However, there is a clear adaptation through causal attribution, where perceived control of the illness is shown despite the poor psychological and social state of the patient. In some studies, the patients were firstly asked about their thinking of their heart attack, and secondly, about the health measures they would take as a result of this attack. After several months, their employment and social functions were measured. It has been found that patients who attributed the cause of a heart attack to factors that can be modified and fall within their personal control were more effective in controlling their lives in actively planning the healing process [34]; while, the association of the avoidance method with increasing emotional suffering makes it one of the risk factors in the negative response to illness. Active coping predicts good adaptation to Multiple Sclerosis [35], [36]; those patients, who are able to adapt using several coping strategies to manage their illness, will generally cope better than those who use a single strategy, allowing for better alignment to the adaptation [3]. In addition, the confusion of the patient leads him to rely on others, and as a result of this dependence, he becomes a threat to himself.

The negative correlation between coping strategies and quality of life explain the impact of chronic illness on the performance of the patient through the pain, the loss of vitality, and the reduced physical activity associated with their performance and poor health; however, the quality of life, especially in overcoming associated depression, for chronically ill patients is improved through the promotion of appropriate coping strategies, especially in the late stages of adaptation [10].

It is possible to predict the emotional role through the *illness identity*, which calls for the patient to choose both the *asking for assistance* and *guarding* of illness focused strategies that are often associated positively with disability and depression, and negatively with quality of life, as in the study conducted by Javier related to Fibromyalgia Syndrome; unlike methods focused on the emotion associated positively with quality of life [37]. The perception of illness identity with *psychological attribution* is related with the patient's lack of *vitality* and poor *physical state*. Almost all studies are consistent with the results of this study in that patients focused on negative strategies such as *guarding*. The avoidance method is linked with increasing psychological pain, as one of the risk factors in the negative response to illness, which can exacerbate the disease itself. It is possible to predict a patient's adaptation to their illness through those aspects emanating from the patient's identity, goals, desires, and aspirations for the future. There is an impact of the *external attributions* such as trauma, stress on the *mental health perceived* and the poor *emotional* and *physical roles*, which emerges out of *asking for assistance* from others. A study conducted on heart patients [34] highlighted the importance of issues related to *external attribution* and the feeling of self-control.

Affleck and his colleagues believe that blaming others is not an adaptative strategy, i.e., attribution of disease to pressure caused by family members or colleague at work may express hostility and the conflict cannot be solved, which could interfere with the process of adaptation with the disease [38].

There is an impact of *medical attributions* (such as diet and therapeutic adherence) on the poor *physical functioning,* which calls for the selection of a *task persistence* strategy, where the patient continues to enjoy recreational activities. Chronic illness impacts on these important factors of the patient's life, as it threatens the patient's concept of self-achievement. For this reason, the patient chooses a strategy that focuses on emotion through self-gratification guidance, which involves the revival of the basic meanings related with their self-esteem, as a way to restore their *physical functioning* and *physical activity* in order to be able to continue in spite of all the negative effects related to the disease. When the coping strategies focused on the illness fail or decrease in its level, the patient chooses another strategy to assess his condition for the better by trying to modify the emotions towards the positive, as health problems generally lead people to choose emotion-focused coping strategies, perhaps due to the health threat posed on the individual that must be endured, but is not easily submitted to a direct action [34], [3].

VII. IMPLICATIONS

This study has theoretical implications, in terms of

providing some support for the CSM. The findings also highlight useful areas of future research for the CSM in chronic illness. In addition, the study has important clinical implications with regard to interventions that may be beneficial in a chronic illness population. The fact that a number of beliefs were found to be directly predictive of disability levels and that coping strategies an important mediating variable between illness representations and quality of life highlights the importance of a person's cognitions in adapting to illness. Subsequently, it provides further support for treatment programs designed to modify maladaptive beliefs, such as cognitive behavioral therapy (CBT). Moreover, the role of coping strategies as a mediator was most significant for the consequences representation. Recently, CBT approaches in chronic illness have been more modified to include a greater element of acceptance [39]. Given that the acceptance advocates striving towards a meaningful life despite illness and pain [40]. In addition, this research can support psychotherapeutic approaches based on both empirical value and further knowledge regarding the importance of psychotherapeutic interventions in chronic illness management.

VIII. CONCLUSION

This study had three main aims: Firstly, to explore the profile of illness representations and their relationship to quality of life in patients with chronic illness. Secondly, to examine the ways in which illness representations and quality of life were related to coping. Finally, this study aimed to investigate the role of coping as a mediator between illness representations and quality of life in a chronic illness population. There was a significant association between illness representations and a number of outcomes. These relationships were in the predicted direction.

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