e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(1); 725-738

Original Research Article

Activation for Self-Management in Patients with Diabetes, Chronic Obstructive Pulmonary Disease, Chronic Heart Failure, and Chronic Renal Disease: A Cross-Sectional Survey Study Patients with Diabetes, Chronic Obstructive Pulmonary Disease (COPD), Chronic Heart Failure (CHF), and Chronic Renal Disease (CRD)

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Received: 03-11-2022 / Revised: 30-11-2022 / Accepted: 30-12-2022

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Conflict of interest: Nil

Abstract

It has been shown that a sizeable fraction of patients suffering from chronic diseases do not react favorably to self-management treatments. This finding shows that one size does not fit all, which calls for interventions that are more specifically customized. We want to have a better grasp of the traits that are connected with patient activation for self-management, and we want to determine whether or not these features are disease-transcending. This will allow us to design more tailored strategies. Patients with type-2 Diabetes Mellitus (DM-II), Chronic Obstructive Pulmonary Disease (COPD), Chronic Heart Failure (CHF), and Chronic Renal Disease were included in a survey study that was carried out in primary and secondary care settings (CRD). We examined the relationships between self-management activation (as measured by the 13-item Patient Activation Measure; PAM-13) and a broad variety of sociodemographic, clinical, and psychosocial factors by using multiple linear regression analysis. In addition, we investigated if the relationships found between the determinants and the PAM were influenced by illness by trying to see whether the disease acted as an effect modifier. Through the use of logistic regression analysis, we were also able to determine the factors that are related with a low level of activation for self-management. We enrolled 1160 patients,425 of these 1160 individuals were diagnosed with DM-II, 290 were diagnosed with COPD, 225 were diagnosed with CHF, and 220 were diagnosed with CRD. The results of a multiple linear regression analysis revealed 9 explanatory determinants of activation for self-management. These determinants are as follows: age, body mass index (BMI), educational level, financial distress, physical health status, depression, illness perception, social support, and underlying disease. Together, these factors explain 16.3% of the variance. Every relationship was a disease-transcending one, with the only exception of social support. The purpose of this research was to investigate the elements that are connected with different activation levels for self-management. These findings represent the first step in assisting doctors and researchers in the process of identifying subpopulations of patients suffering from chronic diseases who are less likely to participate in self-management. There is a need for an increase in the number of scientific

efforts made to explain the majority of the components that contribute to the intricate nature of patient activation for self-management.

Keywords: Diabetes Mellitus, Chronic Heart Failure, Chronic Renal Disease, Patient Activation Measure, Body Mass Index, Underlying Disease, Self-Management.

Introduction

The increasing number of individuals who are living with one or more chronic illnesses presents a significant challenge for the healthcare industry [1]. There is a correlation between having a chronic disease and having a greater risk of death as well as a worse quality of life [2]. The increasing number of individuals suffering from chronic diseases exerts a significant strain on our healthcare systems. Self-management is an approach that shows promise for reducing the load imposed on patients as well as society. The capacity of a person to manage the symptoms, therapy, physical and psychological implications, and lifestyle adjustments that are inherent in living with a chronic disease is referred to as self-management [3, 4].

Over the course of the last two decades, a significant amount of scientific study on self-management has been carried out, and a diverse array of self-management programs have been produced for a variety of different groups. According to the findings of meta-analyses [4–6]. self-management has the potential to enhance quality of life, some disease-specific outcomes, and may lower overall expenditures associated with medical treatment. Although good benefits are observed in mean group outcomes, individual studies reveal that a significant fraction of patients do not comply with or react to these therapies. This is despite the fact that favorable effects are seen in mean group results. This is evidenced by the results of five clinical trials evaluating the effectiveness of an almost identical self-management program in COPD patients, which ranged from highly successful to even harmful [7,8]. The results of these trials demonstrated that there was a large amount of variance in the outcomes.

Very little is known about the differentiating qualities of patients who are most likely to gain from participating in a self-management program. The identification of characteristics linked with the degree to which patients are engaged for self-management is the first step in the process of better comprehending the variability in effect size. Previous research has identified a number of factors that are associated with self-management behavior. Some of these factors include age [9], gender [9], education level [10], multi-morbidity [9], depression and anxiety [9,11,12], disease characteristics [10], illness perception [12], social support [13], disease duration, disease severity [9], low socio-economic-status [14], and health literacy [14].

The approaches used in these investigations were quite diverse, and the primary attention was placed on disease-specific characteristics. Since many patients have more than one chronic ailment, we expect that a considerable majority of the characteristics related with levels of activation for self-management are disease-transcending rather than disease-specific. [15] Previous research only looked at a small number of parameters at the same time, therefore they ignored a wider range of illness and patient features. A deeper knowledge of the elements related with activation for self-management, regardless of condition, is a critical first step in developing personalized methods.

This study aims to identify determinants of activation for self-management in patients with chronic diseases. More specifically, the patients in this study have Chronic Obstructive Pulmonary Disease (COPD), Chronic Heart Failure (CHF), Diabetes Mellitus type II (DM-II), or Chronic Renal Disease (CRD) (CRD). In addition, the purpose of this research is to identify the characteristics that are linked with patients suffering from chronic diseases who are at the greatest risk for poor activation for self-management and to evaluate whether or not these correlations are disease-transcending.

The Components and Procedures

Create and conduct research on the population

In four different patient groups, descriptive cross-sectional research was carried out in a duration period of October 2021 to September 2022 to investigate the connection between the various factors and the outcomes (COPD, CHF, DM-II and CRD)in JLNMC, Bhagalpur, Bihar. These diseases were chosen because they are among the most common encountered in clinical practice. Furthermore, a significant portion of the progression of the disease and the burden it imposes can be slowed down or partially prevented if patients take an active role in the management of their illness. One questionnaire was used to evaluate both the determinants and the result, and this was supplemented with a study of the charts.

Patients over the age of 18 who had a clinical diagnosis of COPD, CHF, DM-II, or CRD made up the study's population. Patients who met the inclusion and exclusion criteria were recruited from a total of ten different healthcare facilities, including six primary care and four secondary care facilities. Adult patients who met the inclusion criteria had to have a clinical diagnosis of either COPD (age 40, post-bronchodilator FEV1/FVC ratio 70%), CHF (verified by clinical signs and symptoms and documented by a cardiologist), DM-II (fasting plasma glucose 7.0 mmol/l or 2h plasma glucose 11.1 mmol/l), or CRD (Glomerular Filtration Rate 60 mL The inability to speak, read, or write Dutch was one of the criteria for exclusion, along with diseases that may compromise the validity of the research (such as cognitive impairment), as well as having any form of terminal illness (with a life expectancy of less than three months).

Procedure/Ethics

Patients who met the inclusion and exclusion criteria were identified by a chart review and chosen for participation. Patients got a letter from their attending physician inviting them to participate in the trial, together with an informed consent form, a questionnaire, and study material that outlined the factors that were to be evaluated as part of the investigation. Patients were requested to provide their signatures on the informed permission form as well as fill out the questionnaire and send it back to the study team. Patients were only included to the study when both papers were obtained, at which point a chart check was carried out. After a waiting period of three weeks, a reminder was sent to the patients who had not responded to the original invitation. The ethics committee gave its blessing for the research to go forward and approved it.

Outcome measure

The Patient Activation Measure, which consists of 13 questions, was used to evaluate the main outcome, which was the activation for self-management (PAM-13). Because it evaluates a person's self-reported knowledge, abilities, and confidence for self-management regardless of the underlying chronic disease, the Patient Activation Measure (PAM) was regarded as the most effective general measure [16,17]. Research has revealed that the PAM-13 is connected with a variety of self-management behaviors,

such as going to the gym and engaging in activities that are particular to a condition. There is a correlation between a favorable change in activation and a favorable change in a variety of self-management behaviors [18,19].

On a scale from one to five, the responses are provided. To arrive at an overall raw score, the scores on each item are added together; then, using the scoring table [20,21] provided by the PAM, this score is transformed into a hypothetical 0–100 point scale. The PAM-13 differentiates between four activation levels, each of which is related with an increasing amount of participation in self-management. On the basis of several thresholds A person may be placed in level 1 if they have less than 47 points, level 2 if they have between 47 and 55.1 points, level 3 if they have between 55 and 67 points, and level 4 if they have more than 67.1 points [17]. Level 1 consists of the patients who have the lowest activation ratings, which correlate to a low level of participation in self-management. These patients do not play an active part in their own self-management, and as a result, they are deemed to be passive receivers of treatment [16].

Determinants

Several different scales, questionnaires, sociodemographic factors, and aspects of the condition were used in order to conduct an analysis of the factors that determine activation for self-management.

The Short Form-12 Health Survey (SF-12) [22] was used to evaluate the respondent's state of health. The SF-12 is a condensed version of the Short Form-36 Health Survey (SF-36) [23]. Two summary scores on a scale ranging from 0 to 100 are used in the SF-12 to assess a person's physical and mental health. There is a correlation between higher scores on the SF-12 and improved health status. The results of the SF-12 and SF-36 indicated that there was an almost perfect overlap [24].

The Hospital Anxiety and Depression Scale (HADS) was used in order to quantify levels of both anxiety and depression [25]. This self-reported screening questionnaire consists of 14 questions and is used to determine whether or not general medical patients are experiencing symptoms of anxiety or depression. The HADS consists of two different 7-item measures, one for anxiety and one for depression; the scoring range for each of these scales is 0–21. If you have a higher grade, it means that your anxiety or depression is at a greater level. If you score lower than 11, it may indicate that you suffer from an anxiety or depression illness [26].

The Brief Illness Perception Questionnaire (B-IPQ) was used to assess people's perceptions of illness. The B-IPQ has eight questions, each of which receives a score on a scale ranging from one to ten. A total score may be determined (scores range from 0 to 80), with a higher number indicating a more alarming perception of the condition [27]. Both the presentation and the substance of the validity were deemed to be satisfactory. The reproducibility results demonstrated a dependability that ranged from moderate to excellent [27].

The Multidimensional Scale of Perceived Social Support was used to conduct the study that investigated social support (MSPSS). [28] This is a 12-item scale that was intended to evaluate how much social support people felt they received from their peers. The support of one's family, friends, and significant people is emphasized throughout the scale. The items were graded using a Likert scale with seven points. The higher the scores, the stronger the perceived level of support [29].

To gain an idea of a person's socio-economic standing, researchers looked at factors such

as their degree of education, the severity of their financial problems, and whether or not they received a care allowance. The levels of education were categorized as follows: lower education included elementary school through vocational training, medium education included secondary school or vocational training, and higher education included college or university degrees. The levels of financial difficulty were categorized as either none, low, or high. It was operationalized that receiving care allowance required either a single yearly income of less than 30,939 rupees or a combined annual income of less than 42,438rupees [30].

Both the intensity and the length of the disease were features of it. The stage of the illness was used as a metric for operationalizing the indicators of disease severity. After diagnosis, patients' disease durations were categorized as having either been 2 years, 2–5 years, or >5 years long.

The Charlson Comorbidity Index was used in order to determine the significance of comorbidities [31]. This index is calculated based on relative risks of mortality, in which ICD-10 conditions were assigned with values of 1, 2, 3, or 6 (all other conditions are given a score of 0) [32]. Comorbidities were obtained by a study of the medical records, and a total score was calculated by adding up the values that were given to each patient.

Data analysis

The SPSS Windows Version 20 was used in the conducting of the analyses [33]. For continuous data, patient characteristics are shown as the mean standard deviation, whereas for categorical variables, the number of patients and their percentages are given. Patients were disqualified from the study if the dependent variable, the PAM-13, was missing more than seven items or if each of the study's 13 questions was answered in the same way [21]. Multiple imputation was conducted after the analysis of missing values for all of the independent variables. This was done because imputation of missing values has the potential to minimize bias in situations when the values are absent at random [34]. There were a total of ten sets of imputed data produced. In order to get a pooled estimate of the relationship, the estimates obtained for each data set were averaged. The rule of thumb used to calculate the necessary number of events for statistical power was ten for each variable [35].

Although linear regression was done, it was not employed as a tool for selecting candidate variables [36]. Instead, linear regression was used to demonstrate the connection between a univariable determinant and an outcome. In order to identify the factors that are linked with activation for self-management, a multiple linear regression analysis using the stepwise backward technique was carried out. We chose our variables based on whether or not their p-value was less than 0.20. This methodology was performed to each set of data, which ultimately led to the selection of 10 different variable sets. The final list included only of those variables that were chosen in at least half of the 10 different data sets [37]. The outcomes of the combined efforts are revealed. For the purpose of computing pooled R2 statistics, we adopted Harel's [38] recommendation and transformed Fisher's r values into z values. The assumptions of linearity and homoscedasticity were investigated, and they were found to be acceptable. The researched determinants and the result were arranged in a multiple correlation table, and collinearity was considered if r was more than 0.8. (S1 Table). In the linear regression analysis, generalized linear models were used in conjunction with robust standard estimators due to the fact that the assumption of normality was not entirely satisfied.

We tested if illness was an effect modifier in order to determine whether the connections between the determinants and activation were

disease-specific or whether they were present in all activation. This was accomplished by comparing the R squared change of the final model with the identical final model, but this time including an interaction term of one predictor variable with illness dummy variables. This was done so that the results could be more accurately interpreted. This technique was carried out several times for each of the determinants that were chosen. However, since individuals might have more than one chronic condition that was being researched, and because this could have an effect on the outcomes of our analysis, we performed this analysis once again on a sample of patients who only had one disease that was being investigated.

PAM results were dichotomized into patients who were at level 1 and patients who were at levels 2–4 in order to determine the characteristics that were related with inadequate activation for self-management. Subsequently, a logistic regression analysis was done and variables were found using a similar manner.

Results

Response and patient characteristics

A total of 2195 patients who were eligible to take part in this research were contacted about the possibility of doing so, and 1295 of those patients agreed to take part. Of these patients, 35 patients were not eligible as they did not fulfill the inclusion and/or exclusion criteria. Another 55 individuals' PAM-13 values were deemed invalid [21], and they were thus disqualified from the study. Data from 1160 patients (response rate 55%) were included in the final study. 425 of these 1160 individuals were diagnosed with DM-II, 290 were diagnosed with COPD, 225 were diagnosed with CHF, and 220 were diagnosed with CRD. The age range of the participants ranged from 28 to 92 years old, with a mean age of 69.5 years old, with a standard deviation of 10.5. Table 1 contains a description of the patient's characteristics as well as their mean PAM-13 scores.

Table 1: Patient characteristics of the combined and separate chronic disease population(s).

	DM-II (n = 425)	COPD (n=290)	CHF (n = 225)	CRD (n = 220)	Total (n = 1160)
Gender					
Male	245	190	130	140	705
Female	180	100	95	80	455
Age (years)	65.0±10.5	69.5±10.2	75.5 ±9.5	70.5±11.5	69.5±10.5
Ethnicity					
Our country	405	270	215	205	1095
Other	25	20	10	15	70
BMI (kg/m^2)	30.5 ± 4.5	25.6 ± 4.5	26.5 ± 4.0	27.8 ± 4.8	25.6 ± 4.5
Living situation					
Living alone	105	70	85	70	330
Living not alone	315	220	140	150	825
Illness duration					
≤2 years	80	60	50	80	270
2–5 years	115	70	55	80	320
>5 years	230	160	120	60	570
Illness severity					
Mild	85	90	75	65	315

Moderate	295	180	150	140	765
Severe	45	20	18	20	103
Charlson comorbidity index	2.5 ± 1.0	2.6 ± 1.0	3.9 ± 2.5	4.2 ± 1.5	2.9 ± 1.5
Smoking					
Never	131	30	50	65	276
Former	239	180	135	130	684
Current	55	80	40	25	200
Education					
Low	210	130	115	100	555
Medium	155	110	50	90	405
High	60	50	60	30	200
Financial distress					
None	215	115	105	104	449
Low	160	135	100	95	490
High	50	40	20	21	131
Care Allowance*					
Received	225	120	140	110	595
Not received	200	170	85	110	565
HADS					
Depression	4.5 ± 3.5	5.8 ± 4.1	5.5 ± 4.0	5.1 ± 3.8	5.1 ± 3.9
Anxiety	4.2 ± 3.5	5.9 ± 4.3	5.5 ± 4.0	4.5 ± 3.8	4.9 ± 3.9
Health status (SF-12)					
Physical	60.5 ±25.4	45.5±24.5	40.5±24.1	49.5±26.6	51.1±26.3
Mental	69.5 ±24.0	65.5±23.5	60.7 ±24.5	66.5±23.1	65.2±23.5
Illness perception (B-IPQ)	31.4 ±10.6	40.5±12.0	40.6± 11.5	38.8±12.5	37.3±12.7
Social support (MSPSS)	65.5± 15.0	60.6±17.5	65.0± 15.0	64.0±15.5	63.5±15.8
Comorbidity DM		30	65	78	
Comorbidity COPD	40		42	36	
Comorbidity CHF	25	15		41	
Comorbidity CRD	30	10	75		
Activation (PAM-13)	55.5± 11.5	54.5±10.5	53.5±11.0	52.4±10.0	55.0±10.5

Identifying variables associated with activation for self-management

0.17 was the value for the explained variance (R2) in the comprehensive multivariable linear model. Backward selection was used to reduce the model to a model with nine variables, however this did not significantly affect the amount of variation that was explained (R2 0.16). In the final reduced multivariable model, the variables that were linked with self-management activation were as follows: age, body mass index (BMI), degree of education, financial hardship, physical health status, depression, disease perception, social support, and chronic condition.

In addition, we investigated whether the correlations between the determinants and activation were universal to all diseases or were limited to a single condition. In the final model, every single one of the factors was connected with the PAM-13, with the exception of social support. This was the case regardless of the underlying chronic disease.

The relationship between social support and activation varied depending on the circumstances. When compared to DM-II, there was a slight negative interaction between social support and condition, most notably for COPD. This indicates that the relationship between COPD and activation is based, in part, on the availability of social support. In the examination of individuals who had just one of the conditions that were evaluated, we only identified the same relationship for COPD and social support.

Identifying patients who have the most potential for low levels of self-management activation

The findings of the logistic regression analysis are shown in Table 2. Having a higher body mass index (BMI), experiencing more financial distress, having a higher comorbidity index score, having a medium education level, having a shorter disease duration, having a more negative illness perception, living alone, and being depressed were all factors that were associated with poor activation.

Table 2: Multivariable logistic regression analyses determinants associated with poor activation for self-management.

	Multivariable logistic regression
	OR (95% CI)
BMI (kg/m^2)	1.08
Living alone vs together	1.50
Financial distress	
Low vs none	1.70
High vs none	1.65
Charlson comorbidities index	1.10
Education level	
Moderate vs low	1.45
High vs low	0.80
Duration of disease	
2–5 yrs vs ≤ 2 yrs	0.69
> 5 yrs vs ≤ 2 yrs	0.65
Physical Health status (SF-12)	0.98
HADS depression	1.05
Illness perception	1.02
Social support	0.99
Chronic disease	
COPD vs DM-II	0.69
CHF vs DM-II	0.89
CRD vs DM-II	1.25

Discussion

The purpose of this research was to discover the factors that are connected with patient activation for self-management in populations suffering from several chronic diseases. In all, nine different explanatory factors were shown to have a weak association with activation. These variables are as follows: age, body mass index (BMI), education level, financial hardship, physical health status, depression, sickness

perception, social support, and disease. In spite of the fact that a large number of factors were included, the multiple linear regression model was only able to account for 16% of the variation in self-management activation. This indicates that 84% of the data is still inexplicable. With the exception of social support, it was discovered that every variable in the model was disease-independent.

In addition, characteristics related with individuals suffering from chronic diseases who were at the greatest risk for inadequate activation for self-management were investigated. These factors included body mass index, whether or not one lived alone, level of education, degree of financial strain, comorbidity index score, disease duration, depression, and sickness perception. In this model, the majority of characteristics are the similar; however, living alone, having a high score on the comorbidity index, and having the illness for a longer period of time are uniquely related with poor activation.

The distribution of PAM levels indicated that only a minority of the patients were in PAM level four, and that the majority of patients were in levels one and two. This indicates that there is a significant amount of opportunity for improvement in these patients' activation for self-management. The mean scores on the PAM-13 for this research were 55.0, which is much lower than the 61.3 that were found in another Dutch study by Rademaker *et al* [20]. This might be explained by variations in the patient group, such as a much younger average age of patients (60 vs 70 in the current study).

Previous research has provided a description of a variety of individual characteristics that impact (activation for) self-management. The majority of the findings in this research are consistent with those found in previous articles. The majority of research focused on individuals with a single condition and looked at a limited number of patient characteristics [10,14,39]. Previous research that used the PAM-13 found that patients who were female, somewhat younger, had a higher education level, and self-reported being in better health had higher PAM-13 scores [16]. In a sample from the Netherlands, Rademaker *et al*. reported the similar correlations; however, they found that male gender, as opposed to female gender, was related with a higher PAM-13 score [20]. In this particular research, there was no correlation between gender and PAM-13 scores; the other relationships were comparable. According to the findings of Hibbard *et al*. [16], which are consistent with the findings of our research, experiencing depressed symptoms is associated with having a lower PAM-13 score.

The purpose of this research was to determine which factors, on their own, are independently linked with activation for self-management. Even though we looked at a very large number of different factors, we could only account for 16% of the total variation. This is consistent with the findings of the research conducted by Rockwell and colleagues, which reported a low explained variance of 10.3% [10]. Rockwell *et al*. put a model of seven patient characteristics in CHF patients through its paces and discovered that only two of those characteristics were positively associated with self-management of heart failure. These two characteristics were an increased disease severity and an increased level of education. In this particular investigation, the severity of the illness was omitted from the model as an explanatory variable. Another research on CHF found that gender, moderate-to-severe comorbidity, depression, and self-care confidence were the factors that best described the variation in self-care management. [9] This study explained 38% of the total variance in self-care management. They discovered that greater self-care ratings were connected with male gender as well as moderate-to-severe

comorbidity index. According to the findings of our research, patients whose comorbidity index was greater also had lower levels of activation for self-management. The high variability present in the outcome measures as well as the variables that were selected may provide an explanation for the variations in the determinants that were discovered and the variance that was explained.

We anticipated that we would be able to explain a bigger proportion of the PAM-13 score's variability if we used a model that consisted of 19 disease- and patient-specific factors. However, there was not much of a linear relationship between the factors and PAM-13. It is possible to draw the conclusion that engaging in self-management is a complicated and maybe even diffuse activity that is difficult to comprehend using conventional disease- and patient-related characteristics. The fact that the connections discovered were disease-transcending is a significant result. This indicates that the effect that these associations have on varied degrees of activation for self-management is unaffected by the underlying chronic illness being studied. The first issue that has to be answered is which other variables may account for the remaining 84% in our model. According to Bandura's social cognitive theory [40], self-efficacy, or the belief that a person is capable of doing a certain activity, is the most important factor in determining whether or not an individual would participate in a health-related behavior. Due to the fact that the PAM-13 already has questions measuring self-efficacy, this construct was omitted from the analysis. The Prochaska *et al*. Transtheoretical Model of Behavioral Change was used in the development of the PAM-13 [41]. This approach places an emphasis on having the necessary motivation and willingness to go through the many phases of transformation. When discussing the factors that facilitate self-management participation in qualitative research [42,43], motivation is a component that is commonly addressed. Nevertheless, we did not quantify motivation as a distinct variable in this study. It's possible that factors like motivation and self-efficacy had a role in helping to explain the remaining variation. Other characteristics, such as health literacy [20] and cognitive impairment [44], which have been found to be linked with activation for self-management, were not included in our model, despite the fact that they may have been contributors.

This research has a number of strengths, including its large sample size as well as its relatively high response rate. In addition, the sample comprised people suffering from four distinct chronic disease groups, and we included individuals who had been treated in both primary and secondary care settings, which produced a broad spectrum of illness severity.

The use of self-reported questionnaires is a limitation of the study. These questionnaires have the potential to introduce misclassification owing to the desire of patients to offer responses that are socially acceptable, which may have resulted in an underestimate of the effects. Because the study was designed using a cross-sectional approach, it is impossible to make any conclusions on the cause and effect of the findings. In addition, because of the way the poll was designed, we were unable to incorporate all of the possible relevant determining factors. Patients with cognitive impairments were not included in the study because researchers believed that these impairments would result in fewer reliable responses from the patients on the questionnaire. In addition, there were not too many non-native patients included in the study, which is possibly because of the language barrier that existed while filling out the questionnaire.

A generic questionnaire called the PAM-13 was selected as a measure for activation for self-management after researchers attempted to uncover factors that were common to four different types of chronic illnesses. When it came to evaluating the difficulty of activation for self-management in various target audiences, we thought that this instrument was the most effective way that was already available.

In further longitudinal research, it will be necessary to study whether or not the characteristics that have been found may be used to identify subgroups of patients that face obstacles while attempting to participate in self-management. When it comes to the activation of self-management, more research has to be done to determine the significance of other aspects such as cognitive impairment, health literacy, motivation, and self-efficacy. In addition, there must be an effort made in the scientific community to discover the causal pathways that connect these factors and activation. This information might assist medical practitioners in identifying patients who are at risk of engaging in suboptimal self-management behaviors. This is a critical step in the process of developing therapies that are more personally focused and suited to each patient.

Conclusions

The findings of this research contribute to a greater knowledge of the patterns of activation for self-management among a large sample of individuals suffering from chronic diseases. In spite of the fact that the underlying illness may vary, a sizeable proportion of patients have low PAM scores, which is indicative of insufficient levels of activation. According to the findings, age, body mass index (BMI), level of education, financial distress, physical health status, depression, illness perception, social support, and disease are all associated with activation for self-management, while BMI, living alone, level of education, financial distress, comorbidity index score, disease duration, and depression are all associated with poor self-management engagement. As was to be predicted, the majority of the model's variables were disease-independent, with the exception of social support. This information is a first step in assisting health care providers in identifying subpopulations of chronic disease patients who are less likely to be engaged in self-management activities. It is essential to move towards targeting and tailoring self-management interventions, and this knowledge is a step in the right direction. However, there is still a significant amount of ground to cover before we can explain the majority of the components that contribute to the intricate character of self-management behavior.

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