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Locus of Control, Self-Efficacy and Adherence to Medical Regime in Diabetic Patients

Kadambari, Deepti Hooda & NovRattan Sharma
Maharishi Dayanand University, Rohtak

The present study was designed to examine the locus of control and self efficacy in relation to adherence to medical regime in patients with diabetes. A sample of 100 diabetic patients (41 males and 59 females) in the age group of 40-60 years was selected. Locus of control and self efficacy were assessed using Chronic Disease Self Efficacy Scale and Multidimensional Health Locus of Control Scale specially designed for chronic diseases. Patient's adherence to medical regime was measured with Medication Adherence Rating scale, Adherence to Diet and Exercise scales. Correlation analysis revealed significant associations with locus of control and self-efficacy dimensions with the components of Adherence to Medical Regime. Further, regression analysis revealed that adherence to medicine is significantly predicted by self-efficacy to manage shortness of breath and other people's locus of control. Adherence to diet is predicted by other people and internal locus of control. Self-efficacy to exercise regularly significantly predicted adherence to exercise in patients with diabetes.

Keywords: Adherence to Medical Regime, Diabetes, Locus of Control, Self Efficacy,

Diabetes is a chronic disease that stands out from other chronic diseases due to its epidemic spread in India. Diabetes is a group of metabolic diseases with hyperglycaemia characteristic that occurs due to the abnormalities in insulin secretion, insulin action, or both (ADA, 2010). There are mainly two types of Diabetes viz. Diabetes Mellitus, Type I Diabetes is an autoimmune disease caused by body's inability to produce insulin, due to the destruction of insulin-producing beta cells in the pancreas. This type of diabetes has an onset early in life. Type II Diabetes, also known as 'Adult - onset' Diabetes, generally manifests in adulthood. It is a metabolic disorder which is characterized by high blood sugar, insulin resistance, and relative lack of insulin. Diabetes, if left untreated can lead to serious consequences. Moreover, because of the chronic nature of the disease, the patients require lifelong compliance with treatment regime, which includes not only medication, but multiple therapeutic approaches including dietary and lifestyle modifications. The medical regime of diabetes includes taking medicines regularly, diet control, physical activity and may include intake of insulin dosage in some patients.

There are sizeable number of patients who are non-adherent, which in turn significantly affects the treatment outcomes. Poor adherence reduces the clinical benefits from drug/medication use, as well as the overall effectiveness of the health care system. Adherence is a complex behavioural process related to a person's knowledge, belief and attitude about his/her illness, the motivation and confidence in one's own ability to engage in illness management behaviours, expectation regarding the outcome of the treatment regime, and the knowledge of the consequences of non-adherence or poor adherence. Since adherence to medical regime plays a major role in patients' recovery, understanding how patients' beliefs about their disease and its treatment affect behaviors associated with medication adherence and provide important opportunities for improving medication adherence in diabetic patients (Cerkoney & Hart 1980).

Adherence to Medical Regime is defined as the extent to which a person's behaviour, in terms of taking medications, following diets, or executing lifestyle changes, coincides with medical or health advice (Haynes, Taylor &

Sackett 1979). According to WHO (2003), the correlates of adherence behaviours in diabetes can be classified into four clusters: (i) treatment and characteristics of disease i.e. duration of disease, complexity of treatment and delivery of health care; (ii) intra-personal factors - age, gender, self-esteem, self-efficacy, stress, depression and alcohol abuse; (iii) inter-personal factors - quality of the relationship between patients and providers of care, and social support; and (iv) environmental factors - high-risk situations and environmental systems.

In a meta-analysis of 26 studies, Nagasawa, Smith, Barnes and Fincham (1990) reported that psychological factors such as emotional stability, internal and external motivations, perceived benefit, and supportive structure were associated with better adherence to diabetes medicines while perceived barriers and negative social environment were correlated with poor adherence. Various factors influence patient's adherence to medical regime such as demographic variables (Karamanidou, Clatworthy, Weinman & Horne, 2008), socioeconomic status (Simoni, Frick, Lockhart & Liebovitz, 2002) and psychological factors such as personality (Adeniran et al., 2015), intelligence (Deary et al., 2009), social support (Karamanidou et al., 2008), self efficacy (Pells et al., 2008) and locus of control (Helmer, Krämer & Mikolajczyk, 2012).

The term Locus of Control originated from Rotter's Social Learning theory (1954), which states that the behaviour of an individual is motivated by internal (Internal Locus of Control) or external (External locus of Control) factors. The credit of putting Rotter's idea of Locus of Control into the field of health goes to Wallston and teammates (1978). They introduced the term 'Health Locus of Control' and defined it as the extent to which people think their health is controlled by their actions or by efforts and actions of others (physicians and nurses) or by fate and chance.

Self Efficacy includes not only the execution of behaviour and behavioural attainments, but also the perceived strength of individual's ability to regulate motivational thought process, affective states and the social and physical environment (Bandura 1997). Bandura (1997) concluded from an array of studies that greater Self-Efficacy increases the likelihood of initiating actions aimed at improving health, enhances people's responsiveness to health communication thereby influencing regulation of health behaviour which augments adherence to habit change programs and other forms of health promoting behaviour and reduces relapse to addictive behaviour.

Náfrádi, Nakamoto and Schulz (2017) conducted a systematic review of the empirical evidence on how patients' empowerment i.e. their health locus of control and self-efficacy affects medication adherence, to sum up current state-of-the-art knowledge concerning the relationship between patient empowerment and medication adherence across medical conditions and emphasize the need of future research to fill in the gaps. Literature search revealed a few studies that have begun to explore and understand the role of locus of control and self-efficacy in adherence to medical regime in chronic patients like hypertensive patients (Omeje & Nebo, 201; Zaky, 2016), patients with arthritis (Kadambari & Hooda, 2016; Taal, Rasker, Seydel & Weigman, 1993), cardiovascular patients (Christensin et al., 2010) and patients with diabetes (Aljasem, Peyrot, Wissow & Rubin, 2001; Besen, Gunussen, Surucu & Kosar, 2016; Jahan, 2014; Morowatisharifabad, Mahmoodabad, Baghianimoghadam, and Tonekaboni, 2009; Nawafa'h, & Hamdan-Mansour, 2015; Schlenk & Hart, 1984).

Contradictory results have been reported by researchers on the effect of locus of control and self-efficacy on adherence to medical regime in diabetic patients. Morowatisharifabad, et al (2009) and Jahan, (2014), reported a significant and positive association between internal locus of control and adherence to diabetic regime, whereas, Aflakseir and Zarrinpour (2013) found no significant role of internal locus of control in predicting adherence to diet regimen. Researches have reported significant and negative association between chance locus of control and adherence to diabetic regime (Aflakseir & Zarrinpour, 2013; Morowatisharifabad et al, 2009). Aflakseir and Zarrinpour (2013) also reported that external

locus of control and powerful others locus of control significantly predicted adherence to diet regimen in diabetic patients. Chao, Nav, Aikens and Taylor (2005) reported that reduced self-efficacy has a negative association with patient's adherence to medication regime. José Martos-Méndez (2015) found that self-efficacy has a significant effect on patient adherence, specifically regarding diet and exercise in chronic patients.

The review of literature has failed to offer a clear picture of the effects of both health locus of control and self-efficacy in predicting adherence to medical regime in diabetic patients. Furthermore, inconsistencies and limitations in the existing literature suggest that there is a need to conduct more research in this area to solidify the relationships between health locus of control, self-efficacy, and adherence to medical regime in patients with diabetes. The present study aims to explore the role of Locus of Control and Self-Efficacy in Adherence to Medical Regime in diabetic patients.

Hypotheses:

1. There would be a significant relationship between Self-Efficacy, Locus of Control and Adherence to Medical Regime in diabetic patients.
2. There would be a significant contribution of Self-Efficacy and Locus of control in predicting Adherence to medical regime in diabetic patients.

Method

Design:

A correlation design was used in the present study to explore the relationship of locus of control and self-efficacy in adherence to medical regime in diabetic patients.

Participants:

A sample of 100 type II diabetes patients, diagnosed by a medical practitioner (aged 40-60 years and mean age 53.58 years) were selected for the present study. All the respondents were selected from government and private hospitals/ clinics in Rohtak (Haryana, India), using the non-random sampling method. The sample was selected using following inclusion and exclusion criteria. The minimum duration of patient's disease was at least two years (from the time of formal diagnosis) with maximum of 10 years. Patients with co-morbid disorders or extreme severity of diseases or secondary complication were excluded. Patients suffering from or had an acute disease during the preceding one month were not included in the sample. Minimum educational qualification of the respondents was 12th grade.

Tools:

The following tools were used for the present research:

Multidimensional Health Locus of Control Scale (MHLC form c): This scale was designed by Wallston, Stein, and Smith (1994) specially for patients with chronic disease. Form C is designed to be "condition specific" where the word condition can be replaced by name of chronic disease such as diabetes, arthritis etc. It assesses a person's beliefs regarding where control over his/her health lies. This form has 18 items assessing whether an individual is channelized by internal locus of control (Internal HLC), chance locus of control (Chance HLC), doctor locus of control (Doctor HLC) or other people locus of control (Other people HLC). Each statement is to be rated on a 6-point scale, which ranges from strongly disagree (1) to strongly agree (6). Wallston et al (1994) reported that the data from Form C subscale were moderately stable over time and possessed considerable concurrent validity which was demonstrated by modest correlation with appropriate scales from Form A/B. The alpha-reliabilities of the sub-scales were found to be adequate i.e. greater than 0.70 (Wallston et al, 1994).

Chronic Disease Self-Efficacy Scales: It is developed by Stanford Patient Education Centre (1996) and was used to assess self-efficacy in patients with chronic disease. The scale consists of 10 subscales i.e. exercise regularly; get information about disease; obtain help from community, family, friends; communicate with physician; manage disease in general; do chores; social/recreational activities; manage symptoms; manage shortness of breath and control/manage depression. Higher score indicates higher self-efficacy. All the subscales

possess good internal consistency (ranging from 0.77 to 0.91) and test retest (ranging from 0.72 to 0.89) reliability. Nearly all the scales possess good internal consistency and test retest reliability.

Adherence to Medical Regime: Adherence to medical regime was assessed on these dimensions:

a) *Adherence to Medicine:* It was measured through *Medication Adherence Rating Scale (MARS).* The scale is developed by Thompson, Kulkarni, and Sergejew (2000), and it consists of 10 items with a yes or no response format. Patients who respond "NO" to questions 1-6 and 9-10; and "YES"; to questions 7-8 are fully compliant. It has a good internal consistency (Cronbach $\alpha = 0.73$) and reliability (Pearson's $r = 0.76$; $p < 0.05$). The scale possesses sound psychometric properties.

b) *Adherence to Diet:* To measure this, a checklist was prepared by authors consisting of four questions that assess about the level of adherence to prescribed diet of patient. The items require patient to answer in Yes or No format. To establish the test-retest reliability of the checklist, patients with chronic diseases were tested and retested on the same Adherence to Diet checklist after a gap of 15 days. The test-retest reliability (Pearson's Product Moment correlation coefficient) was found to be 0.92.

c) *Adherence to Exercise Checklist:* Adherence to exercise regime among diabetic patients was evaluated using checklist, prepared by authors having four questions regarding adherence to exercise regime where the subject must respond in a Yes/No. A sample of 25 patients was tested and retested on Adherence to Exercise checklist after an interval of 15 days. The test- retest reliability (Pearson's Product Moment correlation coefficient) was found to be 0.88.

Table 1: Mean and Standard deviation values of Locus of Control, Self-Efficacy and Adherence to Medical Regime in diabetic patients

Variables	Mean	S.D.	Possible Score range
Locus of Control			
Internal HLC	32.18	5.93	6 to 36
Chance HLC	16.96	5.21	6 to 36
Doctor HLC	17.78	0.76	3 to 18
Other People HLC	15.32	1.86	3 to 18
Self-Efficacy			
Exercise Regularly	10.46	6.37	3 to 30
Get Information About Disease	6.49	1.86	1 to 10
Obtain Help from Community, Family, Friends	30.81	2.91	4 to 40
Communication with Physician	28.06	2.28	3 to 30
Manage Disease in General	30.76	3.92	5 to 50
Do Chores	20.55	4.20	3 to 30
Social/Recreational Activities	13.82	3.00	2 to 20
Manage Symptoms	33.00	5.43	4 to 40
Manage Shortness of Breath	6.94	1.13	1 to 10
Control /Manage Depression	44.58	6.60	6 to 60
Adherence to Medical Regime			
Adherence to Medicine Regime	9.33	1.49	0 to 10
Adherence to Diet Regime	3.96	0.24	0 to 4
Adherence to Exercise Regime	1.05	1.07	0 to 4

Table 2: Coefficients of Correlation between Locus of Control, Self-Efficacy and Adherence to Medical Regime in diabetic patients

	Adherence to Medicine Regime	Adherence to Diet Regime	Adherence to Exercise Regime
Locus of Control			
Internal HLC	.05	.03	.13
Chance HLC	-.08	-.01	-.09
Doctor HLC	.22*	.19	-.03
Other People HLC	.25*	.34**	-.20*
Self-Efficacy			
Exercise Regularly	.19	-.07	.54**
Get Information About Disease	.03	-.17	.28**
Obtain Help from Community, Family, Friends	.11	.20*	.02
Communication with Physician	.10	.09	-.07
Manage Disease in General	.16	.04	.14
Do Chores	.03	-.14	.26**
Social/Recreational Activities	.10	-.15	.23*
Manage Symptoms	.23*	.10	.19
Manage Shortness of Breath	.30**	.17	.02
Control /Manage Depression	.24*	.08	.08

**p< 0.01,*p< 0.05

Procedure:

A sample of 100 patients with type II diabetes, who met the inclusive and exclusive criteria for the study was selected. After ensuring that the subjects had understood the instructions related to the tools, all the subjects were assessed on locus of control, self-efficacy and adherence to medical regime specially designed for patients with chronic disease and it was ensured that the respondents had answered all the questions in the given set of questionnaires. For analysis, correlation and regression statistical techniques were used and these have been elaborated in the results and discussion sections.

Results

Firstly, the data was analysed using descriptive statistics. Table 1 shows mean and standard deviation of the present sample on all the subscales of Locus of control, Self-efficacy and Adherence to medical regime with the minimum and maximum possible scores on each subscale. All the means were above the midpoint of the score range, except for self-efficacy to exercise regularly and adherence to exercise. The sample scored highest on Doctor Health Locus of control (HLC) followed by Other people HLC and Internal HLC. The lowest mean score was on Chance HLC. The highest and lowest mean score on self-efficacy subscales was on self-efficacy to communicate with physicians and self-efficacy to exercise regularly respectively. For Adherence to medical regime the highest mean score was on Adherence to medicine, followed by Adherence to diet and lowest mean score was on Adherence to exercise.

The present research was carried out with the objective to study the role of Locus of Control and Self-Efficacy in Adherence to Medical Regime in patients with Diabetes. The results of the correlation analysis are as follows:

Locus of Control and Adherence to Medical Regime

The correlations between locus of control and adherence to medical regime in diabetic

Table 3: Predictors of Adherence to Medical Regime in diabetic patients

Criterion Variable	Predictors	Multiple R	R Sq.	R Sq Change	B	F
Adherence to Medicine	1. Manage Shortness of Breath (Self- Efficacy)	.30	.09		.42	9.63**
	2. Other People HLC	.38	.15	.06	.21	8.38**
Adherence to Diet	1. Other People HLC	.34	.12		.26	12.89**
	2. Internal HLC	.43	.19	.07	.08	11.07**
Adherence to Exercise	Exercise Regularly (Self-Efficacy)	.54	.29		.09	40.21**

**p< .01

patients have been shown in Table 2. In fact, it clearly reveals that internal HLC and chance HLC were not found to be significantly correlated to any of the components of adherence to medical regime (adherence to medicine, adherence to diet and adherence to exercise). Whereas, doctor HLC was found to be significantly and positively correlated with adherence to medicine. Thus, patients with doctor as locus of control for their health/ diseased condition are more likely to adhere to the medicine regime. Patients who visit doctors at regular intervals are more likely to adhere to medicine prescribed by the doctor. Doctor HLC was not found to be significantly correlated with adherence to diet and adherence to exercise. Lastly, other people locus of control was found to be significantly correlated with all the components of adherence to medical regime, positively correlated with adherence to medicine and adherence to diet whereas negatively correlated to adherence to exercise.

Self-Efficacy and Adherence to Medical Regime

The correlations between Self-efficacy and Adherence to Medical Regime in diabetic patients have been shown in Table 2. Significant associations were observed between health related self-efficacy dimensions and components of adherence to medical regime. The results reveal that adherence to medicine was found to be significantly and positively correlated with self-efficacy to manage symptoms), manage shortness of breath and control/manage depression. The results of the correlational analysis point out that adherence to diet in diabetic patients is significantly associated with self–efficacy to obtain help from community, family, and friends. Adherence to exercise was found to be significantly and positively correlated with exercising regularly, getting information about the disease do chores and social/recreational activities regime.

The obtained results clearly indicate that locus of control and self-efficacy dimensions are significantly associated with one or the other component of adherence to medical regime (adherence to medicine, adherence to diet and adherence to exercise) in patients with diabetes. Thus, the first hypothesis of the study is partially verified.

Locus of control and Self-efficacy as predictors of Adherence to Medical regime

To examine the extent to which weighted combinations of various predictor variables (Self-efficacy and Locus of control) included in the study predict Adherence to Medical Regime (criterion variable), stepwise multiple regression was applied to the obtained data. Regression analysis is a step ahead to correlational analysis in the sense that correlation only tells whether two variables are associated or not whereas regression assesses the predictive power of the variable.

Adherence to medicine is one of the most important components of diabetes regime and was found to be predicted by two predictor variables namely self-efficacy to manage shortness of breath and other people HLC, while the maximum prediction was accounted for by managing shortness of breath which accounted for 9% variance in adherence to medicine. Next variable that entered the equation was

other people HLC which accounted for 6% of variance in the criterion variable. The regression coefficients 'B' for both the predictors pointed in a direction of positive change. Thus, adherence to medicine in diabetics is significantly predicted by their self-efficacy to manage shortness of breath and other people HLC.

Results of regression analysis on adherence to diet revealed that only two variables met the criteria i.e. other people HLC and internal locus of control. Other people HLC accounted for maximum variance in the criterion variable, i.e. 12% of variance. The Second significant predictor of adherence to diet i.e. internal locus of control, was found responsible for 7% variance. The regression coefficients 'B' for both the predictors were positive, thereby indicating positive direction of influence. Thus, other people locus of control and patient's internal control on health outcomes significantly increases adherence to diet regime in diabetics.

The regression equation computed to estimate the extent of variance in adherence to exercise in diabetics, as depicted in the Table 3, revealed that the most significant predictor of adherence to exercise is self-efficacy to exercising regularly. Self-efficacy to exercising regularly accounted for 29% variance. A positive regression coefficient 'B' was indicative of positive direction of influence. Thus, patients with diabetes who feel confident enough to exercise regularly are more likely to adhere to exercise regime.

Thus, the results of regression analysis verify and approve the second hypothesis which states that there would be a significant contribution of locus of control and self-efficacy in adherence to medical regime in diabetics.

Discussion

The present study was designed to examine the locus of control and self-efficacy in relation to adherence to medical regime in patients with diabetes. From the results of the correlation coefficients between health locus of control and adherence to medical regime it can be inferred that internal and chance HLC in diabetic patients is not significantly associated with adherence to medical regime. Morowatisharifabad, et al., (2009); and Jahan (2014) reported significant and positive association between internal locus of control and adherence to diabetic regime. Christensin et al., (2010) also reported positive and significant association between personal control over health and adherence to medication regime in cardiovascular patients. Omeje and Nebo (2011) reported similar results with hypertensive patients.

Significant and negative association between chance locus of control and adherence to diabetic regime are reported by Morowatisharifabad et al., (2009). Aflakseir and Zarrinpour (2013) found chance locus of control to be significantly correlated with non-adherence to diet regime in diabetic patients. The results of the present investigation report significant associations of adherence to medical regime with doctor and other people HLC, which implies that patients with diabetes scoring high on doctor HLC are the ones who attributed their health, disease or even if their disease condition improves, worsens or remains the same more to doctor are more likely to adhere to medicine. Patients with diabetes who displayed more other people HLC, i.e. they believe that their family members and friends determines whether their condition improves, worsens or remains the same are the ones who are more likely to follow medicine and diet regimes, but they show non-adherence to exercise regime prescribed for their diabetic condition by medical practitioner. The results are in line with findings of Aflakseir and Zarrinpour (2013) who reported that powerful others locus of control were more likely to adhere to recommended diet regime.

The positive and significant coefficients of correlation between self-efficacy to exercise regularly and adherence to exercise indicates that patients with diabetes who are more confident to exercise regularly are more likely to follow various exercise regimes (aerobic and gentle exercises) in order to control their blood glucose levels whereas exercise regularly was found to be non-significantly associated with adherence to medicine and diet. Get information about the disease, a dimension of self-efficacy, is significantly and positively correlated with adherence to exercise regime. This indicates that patients who obtain information about their disease (information that may help them to

control their diabetic condition) from community resources are more likely to adhere to exercise regime.

Kadambari and Hooda (2016) also found significant association of self-efficacy to exercising regularly and getting information about disease from community resources which adhere to exercise regime. Getting information about the disease has non-significant association with adherence to medicine and adherence to diet. Significant and positive correlation with adherence to the diet component of medical regime and obtaining help from community, family, and friends imply that patients with diabetes who feel confident to get help from community, family, and friends are more likely to adhere to diet regime as prescribed for diabetes.

Patients high on obtaining help from community, family, and friends feel confident and can seek help from family members in cooking dishes as prescribed and recommended for diabetic patients. Diabetic patients high on this dimension of self-efficacy confidently seek information from friends and community members about dietary changes and different cooking recipes especially for diabetic patients. Such diabetic patients are more likely to adhere to diet regime, obtain help from the community, family, and friends was found to be positively but non-significantly correlated with adherence to medicine and adherence to exercise.

A patient's self-efficacy to communicate with his/her physician, has no significant relation with any of the adherence to medical regime component. Managing the disease in general is positively, but non-significantly correlated with all the components of adherence to medical regime. Significant and positive association is reported between self-efficacy to do chores and the exercise component of adherence to medical regime and non-significant positive association with adherence to medicine and negative association with adherence to diet implies that patients with diabetes who score high on self-efficacy to do chores were also found high on adherence to exercise regime. Thus, patients with diabetes who are confident enough to do chores like vacuuming, yard work, shopping and errands despite of their health problems are also more likely to follow exercise regimes meant for managing their chronic condition. Self-efficacy for social /recreational activities has a significant and positive association with adherence to exercise regime and reveals that patients with diabetes who are confident enough to maintain their recreational interests and hobbies, are also more likely to adhere to their exercise regime. Social/recreational activities was found to be non-significantly correlated with adherence to medicine and adherence to diet. Significant and positive relationship between patient's self-efficacy to manage symptoms and adherence to medicine and non-significant relation with adherence to diet and exercise implies that patient's adherence to medicine increases with increase in self-efficacy to manage symptoms. Managing shortness of breath, the subscale of chronic disease, self-efficacy, positively and significantly correlates with adherence to medicine. Thus, patients with diabetes who were confident enough to keep their shortness of breath from interfering in their day to day life were found to adhere to their medicine regimes. Self-efficacy to manage shortness of breath has positive, but non-significant correlation with adherence to diet and adherence to exercise. Positive and significant correlation between self-efficacy to 'control/manage depression' and adherence to medicine, means that patients with diabetes who were confident enough to control/manage depression related to diabetic condition were more likely to take medicine as per prescription. Control/ manage depression was found to be positively, but non-significantly correlated with adherence to diet and adherence to exercise.

From the findings it can be inferred that diabetic patients with high self-efficacy also adhere more to medical regime. The findings of the present study are supported by Chao, Nav, Aikens and Taylor (2005) who reported that reduced self-efficacy has a negative association with patient's adherence to medication regime. Hurley and Shea (1992) found that individual with higher level of self-efficacy was better able to manage diabetes self care. These findings are seen in line with the findings of the present study. Considered together, the correlational analysis clearly indicated that Self-Efficacy dimensions

and Locus of Control are significantly associated with one or the other component of adherence to medical regime (adherence to medicine, adherence to diet and adherence to exercise) in patients with diabetes.

The regression analysis, indicated that adherence to medical regime components (criterion variables) are significantly predicted by various locus of control and self-efficacy dimensions (predictor variables). Regression analysis identified self-efficacy to manage shortness of breath and other people HLC as a significant predictor of adherence to medicine, which implies that patient's self-efficacy to manage shortness of breath and other people locus of control accounts for his/her adherence to medicine, whereas adherence to diet is significantly predicted by other people HLC. Patients with other people locus of control display better adherence to diet regime prescribed by the health practitioner and adherence to exercise is significantly predicted by self-efficacy to exercise regularly, means that patients with high self-efficacy exercises regularly and adheres more to the prescribed diabetic exercise regime. Thus, the results of regression analysis point out the significant contribution of locus of control and self-efficacy in adherence to medical regime in diabetics. Tillostion and Smith (1996) have also reported internal locus of control as a significant predictor of adherence to diabetes regime. Morowatisharifabad et al., (2009) found internal and chance locus of control as significant predictors of adherence to diabetic regime.

Thus, Health locus of control and Self-efficacy significantly predict Adherence to medical regime in type II diabetes patients. Different set of predictors were obtained for the three components of Adherence to Medical Regime (Adherence to Medicine, Adherence to Diet and Adherence to Exercise) in diabetic patients. These findings would be helpful in designing disease specific intervention programs to enhance Locus of control and Self-efficacy in patients and which in turn may improve adherence to medicine, diet and exercise regime of the diabetic patients.

The investigation was conducted in a well thought out and precedent manner, however, some limitations could not be avoided, and which need to be acknowledged. Here are some of the limitations and suggestions that may provide guidelines for methodological refinements while designing future research in this area. The results of the study may be affected by selection bias, as respondents who agree and disagree to participate in the study may be psychologically different. So, for better generalization of the findings, it would be advisable to select sample using random technique. Secondly, the present study did not consider some of the demographical variables like gender, age, socio-economic status, family type, that may affect the relationship of variables under study. So, considering these variables and making specific group comparison may yield more information and help in better generalization of the results. Thirdly, all the assessment tools used in the study were self-report questionnaires. It would be worthwhile to conduct future research using objective measures of the variable under study. Diabetes type II patients were considered in the present investigation. As a result, our findings cannot be generalized beyond the studied group. Therefore, there's a need to study Self-Efficacy and Locus of Control in relation to Adherence to Medical Regime in patients with hypertension, arthritis, HIV and other chronic diseases.

Conclusion

Chronic disease management can only be achieved by consistent adherence to prescribed medical regime. Based on the results of the study, it can be concluded that Locus of control and Self-Efficacy significantly predict one or the other component of adherence to medical regime. The present investigation emphasizes the need for developing intervention programs to enhance adherence to medical regime with a special focus on locus of control and self-efficacy. The study also provides evidence that health locus of control and self-efficacy may be useful constructs to be included in pre–treatment assessment of diabetic patients for considering their medical regime.

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Kadambari, Research Scholar, Department of Psychology, Maharshi Dayanand University, Rohtak.

Deepti Hooda (Corresponding Author), Assistant Professor, Department of Psychology, Maharshi Dayanand University (MDU), Rohtak. Email: deepti.hooda17@gmail.com

NovRattan Sharma, Professor, Department of Psychology, Maharshi Dayanand University (MDU), Rohtak. Email: sharmanr5@gmail.com