

An Investigation of Correlation of the Physician-Patient Relationship and Religious Orientation with Adherence to Treatment of Adolescents with Type 1 Diabetes

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Abstract

Background and Objectives: Metabolic control and observance of dietary therapy in adolescents with type I diabetes is weaker compared to other patients—the fact which might lead to physical, mental, and social changes in such adolescents in this period of their life. Hence, adolescences are more subject to complications of diabetes. This study, accordingly, was conducted to examine the relationship of religious orientation and physician-patient relations in prediction of treatment in adolescents with type I diabetes.

Methods: In a cross-sectional design, a number of 101 female and male adolescents with type 1 diabetes were selected. Data was collected via Alport Religious Orientation Questionnaire, patient-doctor relationship questionnaire (PDRQ-9) by Vanderfeltzer et al., and General Adherence Scale (GAS-5). Data analysis was performed using Pearson correlation test and Simultaneous and Stepwise Multiple Regression.

Results: Mean of participants' age was 17.5 ± 2.5 , and adherence to treatment was 16.7 ± 2.9 . Adherence to treatment had a significant and negative correlation with external religious orientation ($p=0.002$, $r=-0.3$), while it did not have a significant correlation with internal religious orientation. Also, it had a significant positive correlation with physician-patient relation ($p=0.01$, $r=0.24$). In stepwise regression, ability of prediction of adherence to treatment by external religious orientation was 30%. Internal religious orientation and physician-patient relation had no significant share in prediction of adherence to treatment.

Conclusion: According to the results of this research, external religious orientation has the most powerful correlation with adherence to treatment so that there was a reduction in patients' adherence to treatment as external religious orientation increased. Afterwards, physician-patient relation had a correlation with adherence to treatment so that an increase in physician-patient relation would result in an increase in adherence to treatment.

Keywords: Medication Adherence, Orientation, Physician-Patient Relations, Religious, Diabetes Mellitus.

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Introduction

Diabetes is one of the most common and expensive illnesses in the world (1). It is divided into type I, type II, and gestational diabetes (2). According to some investigations, 5% to 10% of those affected by diabetes are categorized under type I diabetes (3). Since the last decade, prevalence of diabetes has been increased in adolescents. The most common diabetes in adolescents is type I diabetes. One person in 400 to 500 adolescents is affected by diabetes (4).

According to several studies, a great number of patients affected by diabetes confront problems

in managing their drug regimen and other self-control aspects (5). Non-adherence is usually defined as nonobservance of physicians' recommendations that results in deleterious impacts on health or reduced efficiency of medications. It is estimated that about 40% to 45% of patients do not follow healthcare directives (6). Over 50% of patients affected by chronic diseases such as diabetic do not follow medication prescriptions (7).

Metabolic control and observance of dietary therapy in adolescents with type I diabetes is weaker compared to other patients, the fact

which might lead to physical, mental, and social changes in such adolescents in this period of their life (8). Hence, adolescences are highly subject to complications of diabetes. An untreated or weakly managed diabetes might lead to shattering outcomes. Investigations have illustrated that 14% to 47% of diabetic adolescents suffer from hypoglycemia, 34% to 42% suffer from retinopathy, and 2% to 5% suffer from micro albuminuria. Moreover, there is a daily increase in the number of diabetic people and complications ensuing from failure to control the illness despite the high expenses allocated to prevention and control of diabetes (9). Physical, mental, social, and economic variables might play a role in pursuance of therapeutic prescriptions by patients. Some of these factors are personal and some environmental, which are interconnected to one another. Religion and spirituality are personal variables and physician-patient relations, which are a fruit of physicians' and patients' behaviors and characteristics, are environmental factors.

In recent years, a special attention is paid to the role played by spirituality in health. Religion and orientation thereto are held by psychologists as a branch of spirituality. According to Alport, religious orientation is divided into two types: internal orientation and external orientation. Those with an internal religious orientation live with their religion, while those with external religious orientation make use of their religion (10). Therefore, religion and spirituality are capable of diminishing physical symptoms of mental pressure by alleviating activity of the sympathetic nervous system. In addition, there is a positive correlation between religiosity, on the one hand, and optimism, life satisfaction, and purposefulness, on the other. Religion is able to promote the sense of dominance in individuals. A wide-ranging regional study indicated that religion is useful particularly when people encounter a chronic illness or death of whom they love. Under such conditions, resorting to faith is the most practical compatibility instrument (11).

Park and Nachman found that HIV positive patients who had more powerful religious

beliefs reported higher rates of adherence to treatment (12). In a study on type II diabetes-infected black women conducted by Koenig, it was shown that religion and spirituality are associated with blood sugar control (13). In schizophrenia patients, religion and spirituality were proved to be effective in formation of a mentality out of problem and attitude toward chemotherapy (14). A multicultural study by Koenig, George, and Hays showed that religion influences on health through increasing adherence to therapeutic regimens (16). Abdevali, exhibited that attitude to illness, as a divine gift, empowers people against circumstances of illness (17).

Physician-patient relation is another factor impacting on adherence to treatment (18). The higher a physician's expectation from his/her patient, the less likely the patient would be to follow the prescriptions (2). Adherence is largely dependent upon a patient's understanding out of his/her illness and therapeutic plans (7). Straightforward description of the illness for patients and asking them to express their opinions about treatment might promote their understanding degrees. Misunderstandings about asperity of the illness as well as treatment's effectiveness and probable complications could impact on adherence to treatment (6). Stavropoulou found that individuals' understanding about treatment procedures is a more powerful predictor of patients' pursuance of treatment than medication prescription. There is a positive relation between quality of relationship and reliance among healthcare professional and patients and adherence to treatment (19).

Results of another study showed that a positive relationship between healthcare professionals and patients, especially when patients are important, constitutes one of the most fundamental determining factors of adherence (20). Balkrishnan showed that factors associated with physicians, patients, and healthcare systems are of impact on patients' level of adherence (21). Travis expressed that improved physician-patient relations intended to increase patients' awareness of their illness and necessities of treatment bring about elevated degrees of adherence (22). Zahed

Nejad, et al. indicated that a desirable physician-patient relation has a positive relationship with adherence to treatment by patients with type II diabetes. (23). Shakeri Nia maintained that inability of medical staff, particularly physicians and nurses, in establishing appropriate relations with patients causes increased expenses of treatment, dissatisfaction of patients from their treatments, and reduced levels of patients' adherence to physicians' prescriptions (24). Given the importance of the issue, this research was conducted to determine the role of religious orientation and physician-patient relations in prediction of adherence to treatment in adolescents with type I diabetes.

Methods

Research design was a cross-sectional one and statistical population included adolescents with type I diabetes that had medical case in Diabetes Clinic Health Center of Zanjan and Zanjan Diabetes Association. Delavar regards as suitable the number of 20 to 30 persons per one variable in correlation studies (25). Hence, a sample size of 120 persons was held as sufficient for the variables examined here. Since this number was close to the number of patients having active medical cases and possibility of non-engagement of some patients, total sampling method was applied. Inclusion criterion was having an age range of 12 to 20 and informed acceptance. Data was collected via Alport Religious Orientation Questionnaire, Patient-Doctor Relationship Questionnaire (PDRQ-9), and General Adherence Scale (GAS).

Alport Religious Orientation Questionnaire: This test includes 21 four-option items with five-point Likert scale scoring mode: I totally agree (5) to I totally disagree. This instrument has two subscales: external religious orientation with 12 statements and internal religious orientation with nine statements (26). This questionnaire was translated and normalized in 1999. It was made internally consistent by Jan Bozorgi, who calculated its Cronbach's alpha coefficient to be 0.71 and its test-retest value to be 0.74 (27). In this

research, Cronbach's alpha was calculated to be 0.77.

Patient-Doctor Relationship Questionnaire (PDRQ-9): This questionnaire was constructed by Vanderfeltzer et al. in 2004. It has nine items, and subjects have to provide replies to items based on a five-point scale. High scores are indicative of high-quality relations and low scores low-quality relationships between physicians and patients, according to patients. Gensichen, et al. compared validity of physicians and patients and accessibility of physicians with patients' signs, obtaining a correlation of 0.78. In examination of reliability, Cronbach's alpha coefficient and questionnaire creditability coefficient were obtained to be 0.94 and 0.73, respectively (28). In their study on 309 patients referring to health centers at Tabriz University of Medical Sciences, Vahidi et al. calculated a Cronbach's alpha coefficient of 0.79 for this instrument (29). In this study, Cronbach's alpha was calculated to be 0.78.

General Adherence Scale (GAS): This scale, which was designed by Hays in 1994, has five testing articles in a six-point Likert Scale mode. The scale's internal consistency was reported to be acceptable ($\alpha=0.81$). Reliability of this scale, as obtained by Hays et al. based on correlation of test scores and test-retest method, was held to be acceptable with an interval of two years ($N=2,181$, $GAS=0.60$). In the study conducted by Zahed Nejad et al. (2012), Cronbach's alpha coefficient of this questionnaire was obtained to be 0.68 (30). In the present research, Cronbach's alpha was calculated to be 0.79.

Patients, who were informed about objective of the study and its significance, became satisfied to take part in the research. They were instructed how to fill in the questionnaire. Questionnaires were completed in the presence of researcher and questions asked by subjects were replied. Incomplete questionnaires were put aside. Finally, information collected from 101 patients was entered into statistical analyses. Data were entered into SPSS and analyzed using descriptive tests, Kolmogorov-Smirnov test, Pearson correlation test, and multivariable and stepwise regression.

Result

Mean of subjects' age were 17.5±2.5 years. Their other demographic information is cited in Table 1.

Table 1: Demographic information of 101 subjects

Variable	Number	Percentage	
Educations	Under diploma	66	65.3
	Diploma	27	26.7
	Associate's degree	6	5.9
	masters or student	2	2
The risk status of other family members with diabetes	Yes	34	33.7
	No	67	66.3
A person with diabetes in the family subjects	Mother	12	11.9
	Father	8	7.9
	Sister	3	3
	Brother	2	2
	Having two or more people with diabetes in the family	11	10.9

Before conduction of Pearson correlation test to examine correlation between variables under study, the hypothesis of normality of variables' distribution was investigated using Kolmogorov–Smirnov test. Results showed that all variables under study had normal distribution (P>0.05). Thus, it is possible to carry out Pearson correlation test. In addition, values of Variance Inflation Factor (VIF) and Durbin-Watson test were calculated to be 3.6 and 1.4, respectively.

Table 2: Correlation matrix among variables under study

Variable	Mean±SD	1	2	3
1. External religious orientation	24.16±11.7	1		
2. Internal religious orientation	33.4±6.6	-0.155	1	
3. Physician-patient relation	33.5±9.3	-0.324*	0.15	1
4. Adherence to treatment	16.7±2.9	-0.308*	0.017	0.24*

*p<0.05

Table 2 indicates that there is a significant negative treatment between external religious orientation and adherence to treatment (P=0.002). This means that an increase in

external religious orientation would result in reduced degrees of adherence to treatment. Internal religious orientation and adherence to treatment have no significant relationship. Physician-patient relation has a positive and significant relation with adherence to treatment (P=0.001). These correlations, however, are not considerable. In order to determine share of each criterion variable in prediction of adherence to treatment, multivariable regression was applied. Results are presented in Tables 3.

Table 3: multivariable regression analysis forth criterion variable adherence to treatment

Variable	B	SEβ	T	P
Permanent value	17.4		0.03	0.001
External religious orientation	-0.06	-0.2	-2.3	0.021
Internal religious orientation	-0.02	-0.06	-0.6	0.521
Physician-patient relation	0.05	0.16	1.4	0.144

Adjusted R-squared=0.075, P<0.05, F=2.08

Stepwise regression analysis showed that just external religious orientation has been entered into the equation at the end stage (B=-0.07 and P=0.002), and other variables have no significant share in prediction of adherence to treatment by adolescents with type I diabetes.

Discussion

The present research intended to determine the role-played by religious orientation and physician-patient relation in prediction of adherence to treatment by adolescents with type I diabetes. Results showed that external religious orientation had a negative significant relationship with adherence to treatment so that there was a reduction in patients' adherence to treatment as external religious orientation increased. This was not aligned with Berman et al., who found that there is no significant relation between religion and pursuance of therapeutic prescription (15). In the study undertaken by Bradley, et al., which was conducted in qualitative analysis method among south Asian subjects, positive impressions of religion such as powerful healing power of saying prayers was identified as a factor in better control of blood sugar (31).

The study conducted by Dehing, Nelson, Stewart, and Stewart, which intended to examine the impact of deep religious adherence upon patients' views on illness and treatment among 299 Christian subjects, indicated that those patients who had higher participation in faith-based activities or fundamental beliefs had a better sense of psychological well-being. This is, therefore, likely that Christianity and religiosity are a mechanism to adaptively cope with illnesses—the point, which consequently leads to, increased adherence to therapeutic prescriptions by patients with diabetes (32). How, Ming, and Chin demonstrated that religiosity has a negative relationship with low FBS, while no relation with three-month blood sugar. Islam has a negative, significant correlation with three-month blood sugar. Christian subjects or those who had no religion had a lower average of three-month blood sugar compared to other religions (37). As agents which give meaning and objective to peoples' lives, religion and spirituality establish patience and hopefulness in individuals, provoke suffering to be viewed as a natural process in life, and give rise to a positive attitude toward illness and treatment: the Almighty God cares people when they are ill, He engages in their healing procedures, and He assists them to deal with their illness. Such people believe that their healthcare providers attempt to heal them (33).

In contrast, people with external religious orientations hold religion as an instrument to achieve their other objectives. They, for instance, take attendance at religious services as a way to find new friends, or they expect rewards by completing their religious duties. Such individuals are likely to raise doubts about their religion when they are affected by a chronic disease such as diabetes. Under such conditions, a predictable behavior might be resistance to and disobedience of physician's prescriptions in treatment procedures.

Moreover, results exhibited that physician-patient relations had a positive significant relationship with adherence to treatment so that an augmentation in physician-patient relation leads to increased degrees of therapeutic

prescriptions. The correlation among them was not considerable, albeit. This finding was aligned with others, who had found that an increased physician-patient relation would end in improved adherence of diabetic patients to therapeutic prescriptions (19-24, 41).

In their study on 220 patients, Kerse Buetow, et al., found that reliance and coordination among physicians and patients have a significant relationship with adherence to treatment (34). Flamm, et al., showed that 16.8% of 501 patients under the study emitted no adherence to their physicians' prescriptions. In 61.5% of these cases, patients believed that their physicians had not made a special recommendation. In 10.2% of cases, physicians attributed non-adherence to the patients themselves. In 10.7% of cases, non-adherence had happened as a result of drugs' side effects. In 64.6% of these cases, patients were uninformed about the cause of their non-adherence to treatments. Twenty percent believed that drugs are unneeded (35). In a multivariable model designed for therapeutic and demographic factors of patients, Grant et al., showed that patients who were placed at upper quarter of adherence were 53% more likely to experience an increase of medication after an increased three-month blood sugar period (36). In a study respecting physician-patient relation and adherence to treatment, Haskard et al., found that physician-patient relation had a significant, positive relationship with adherence to treatment. Patients who had weaker relationships with their physicians were 19% more likely to disobey their prescriptions.

Instruction of physicians regarding communicative skills brings about a significant and principal improvement in obedience from prescriptions by patients. It elevates chance of treatment adherence up to 1.62 times higher than the time when physicians are not instructed at all (38). In explanation of this finding, this is safe to indicate that relationship is a basic part of treatment process, and patients are given therapeutic information about their regimens during their relations with physicians. In addition, patients are encouraged and supported respecting their motivations and are given assistance regarding the way to apply

required resources to follow therapeutic prescriptions (39).

Establishment of relationship is a human ability that is commuted into reality through instructions. Such skills are integral parts of clinical activities by physicians (40). Studies have shown that 60% to 80% of prognoses and therapeutic decisions are made based on the information achieved upon interviews with patients (24). In psychological well-being, physician-patient relations are vitally important. Firstly, a good amount of information required by physicians to make medical decisions is achieved upon interviews with patients. Secondly, physicians and patients do not always have a convergent opinion about successfulness or failure of consultation processes. Physicians are often too optimistic about consultations and obedience of prescriptions by patients. Thirdly, physician-patient relations are significant for increased acceptance of medical applications such as assisting patients to get needed medications or advice at the right time in the right amount, etc. Fourthly, information exchange among physicians and patients, including revealing bad news, is a primary concern in this relationship. Physicians who are not well instructed in this respect might aggravate patients' conditions by their failure to manage consultation process and dispossession of required capacity (7). Evidence shows that longer consultations come along with issues like these. Fewer medications, advices about lifestyle and health promotion activities, better encounters with psychosocial problems, better capacitation of patients, improved clinical care for some chronic diseases, and higher levels of patients satisfaction are among the factors that lead to improved compliance to treatment process.

Results of multivariable simultaneous and stepwise regression analysis showed that only external religious orientation is a significant predictor of adherence to treatment from among all other examined variables. It alone could predict 26% of variance of adherence to treatment in adolescents with type I diabetes. Among the limitations, encountering this study was attraction of samples' attention and

satisfaction to take part in the research and provide replies to the questionnaire items. Since such patients participate in several studies and are not finally provided with the outcomes, they run out of adequate motivation to get involved. Accordingly, the measure taken was to provide subjects with instantaneous interpretation of their applications with a brief explanation thereon. Additionally, care should be exerted in generalization of these findings to other statistical populations such as type II diabetic patients and type I diabetic adults.

Conclusion

Findings indicate that external religious orientation has a significant negative relationship with adherence to treatment so that an increase in external religious orientation would result in decreased degrees of adherence to treatment. Moreover, physician-patient relation has a significant positive relationship with adherence to treatment: the more desirable a physician-patient relation, the more promoted the level of adherence to treatment would be. Therefore, this is concluded that interventions to reduce external religious orientation degrees in diabetic patients and interventions to improve physician-patient relations in physicians might have an effective role in increased level of adherence to treatment in patients and thus decreased levels of diabetic complications in them.

Conflict of interest

The authors declare no conflict of interest.

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