International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 04, 2020
ISSN: 1475-7192

THE ROLE OF PERSONALITY ON QUALITY OF LIFE AMONG TYPE 2 DIABETES PATIENTS

[1]NORHAYATI IBRAHIM, [2]*RAFIDAH AINI PAKRI MOHAMED,[3]SITI BALKIS BUDIN

ABSTRACT--*Diabetes is one of the silent killer because many diabetic patients are unaware of their disease, symptoms and the complications of the disease. Diseases and certain personality traits have been associated with behaviors that may lead to negative health outcomes. Hence, the objective of this study is to determine the correlation between personality and the quality of life among type 2 diabetic patients. A total of 200 type 2 diabetic patients were selected for this study. Patients were surveyed using validated questionnaires – Short Form 36 (SF-36) to assess the health related quality of life and Big Five Inventory (BFI) to assess the personality traits of patients. The findings of this study showed that most of the sub-domains of the Big-Five Inventory were positively correlated with the sub-domains of Health related quality of life (HRQOL) except for the Neuroticism sub-domain, which correlated negatively with the sub-domain of HRQOL. The study also found that personality contributed 14.3% of the variation to the physical component summary (PCS) domain, while 24.3% of the variation contributed to the Mental component summary (MCS) domain of HRQOL. Therefore, a better understanding of the importance of patient's personality among type 2 diabetic patients is fundamental to improving their health related quality of life.*

Keywords-- *Personality, Quality of Life, Type 2 Diabetes, Neuroticism.*

I. INTRODUCTION

Diabetes is acknowledged to be a major non-communicable disease and remainshighly prevalent globally. Diabetes is usually classified according to three major groups –type 1, type 2 and gestational diabetes (International Diabetes Federation, 2013). Diabetes type 2 refers to a metabolic disease,which is known as non-insulin dependent due to the increased levels of blood glucose anddecreased level of insulin in the body. Most of the patients, about 90%, were diagnosedwith type 2 diabetes (DMJ2), while the remaining 10% were patients with type 1 diabetes(DMJ1) and female patients with gestational diabetes (Kumar et al., 2005). Diabetes is also considered to be a silent killer because many diabetic patients are unaware of their disease, and, incertain patients, most of the complications arising from diabetic disease occur suddenlyor within a short period of time without presenting any of the diabetic

[1]*Health Psychology Programme, Centre for Healthy Ageing and Wellness, Faculty of Health Sciences, National University of Malaysia, 50300, Kuala Lumpur, Malaysia*

[2] **Biomedical Sciences Programme, Faculty of Health Sciences, National University of Malaysia 50300, Kuala Lumpur, Malaysia, fyda_6@yahoo.com*

[3]*Biomedical Sciences Programme, Faculty of Health Sciences, National University of Malaysia 50300, Kuala Lumpur, Malaysia*

DOI: 10.37200/IJPR/V24I4/PR201541
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

symptoms.Diabetes also affects the quality of life of patients due to its complications, physicalsymptoms and changes in the lifestyle of patients(Kumar et al., 2005).

According to the International Diabetes Federation (IDF), 90% of all cases ofdiabetes are type 2, and, by 2030, the number of patients with diabetes is expected toincrease from 285 million to 439 million (Shaw et al., 2009). Based on the 2015 Malaysian National andHealth Morbidity Survey, the prevalence of diabetes mellitus of known and unknowndiagnosis was 17.5% among adults aged 18 years and above. The prevalence was higherin females (18.3%) than in males (16.7%). In terms of ethnicity, Indians had the highestprevalence (22.1%), followed by Malays (14.6%), Chinese (12.0%) and other Bumiputera(10.7%) (Institute for Public Health IPH, 2015).

Personality refers to the outer and inner behavior or characteristics displayed by anindividual compared to another individual consistently and predictably over a relativelylong period of time, and irrespective of the situation. Previous studies have found thatonly 50% of the dimensions of personality are inherited traits and that external factorsalso play an important role in influencing an individual's personality (Loehlin et al., 1988). In the field ofpsychology, the Big Five personality traits, covering five basic dimensions of personalityin the Five Factor model, constitute a measurement tool that has been widely used inassessing an individual's personality (Costa & McCrae, 1992). These five basic dimensions of personalityinclude the characteristics of *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*and *Neuroticism* (John et al., 1991). In fact, empirical studies have found that *Big Five* personality traitsare able to show consistency in interview sessions, a description of oneself and alsothrough the observation of the personality of an individual (Schacter et al., 2011). The measurement toolbased on the *Five Factor Model* has been widely used in assessing the personality of anindividual (John & Srivastava, 1999; McCrae & Costa, 1999).

According to the theory of the Big Five Inventory, *Openness* is a characteristic of anindividual who is open-minded, creative, takes serious precautions and engages indiscussions – particularly in terms of health care – whereas individuals who areself-regulated are well disciplined, take an active role in certain activities and are often careful in controlling their behavior. Christensen and Smith found that individuals withthe characteristics of *Conscientiousness* have properties of high reliability, diligence andself-discipline (Christensen &Smith,1995). The attitude of self-control has been studied and showed that apositive attitude is able to increase the level of self-care in patients on dialysis (Christensen &Smith,1995),patients with type I diabetes (Christensen et al., 1999), and is also able to reduce the risk of kidney damage inpatients with type 1 diabetes (Brickman et al., 1996).

In addition, individuals who demonstrate *Extrovert* characteristics are usuallyfriendly, happy, daring, passionate and liable to create relationships with others, whileindividuals possessing *Agreeableness* characteristics have a high tolerance level andcomply with the doctor's instructions. Studies also show that individuals among chronicpatients who have the characteristics of being *Extravert* and *Agreeableness* are able toimprove their health related quality of life more positively compared with individualswho have the characteristics of *Neuroticism* (Christensen &Smith,1995).

DOI: 10.37200/IJPR/V24I4/PR201541
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

This is because individuals with Neuroticismcharacteristics have a high tendency toexperience anxiety and depression. Such individuals think that any decision involvingtheir health aspect is very worrying and stressful for them. In fact, Lauriola and Levinfound that individuals with *Neuroticism* characteristics dislike risky situations whenmaking decisions and often take simple steps to resolve their problem (Lauriola & Levin, 2001). In addition,individuals possessing the *Neuroticism* trait also display emotional instability and oftensuffer from symptoms of their chronic diseases, an increase in the level of emotionaldistress and also have a low level of health status (Shekelle et al., 1991).

Therefore, it is clearly shown thatpersonality is one of the most important elements influencing the decisions takenconcerning the health aspects and quality of life among patients with chronic diseases.Furthermore, most clinicians and health care professionals are unaware of the importanceof a patient's personality behaviour in terms of an improved quality of life.In short, personality indirectly influences the health related quality of life of patients.Therefore, an understanding of the importance of the psychological aspects affecting thehealth related quality of life of type 2 diabetic patients is very important, and focusing ona patient's personality should be given more attention.

II. MATERIALS AND METHODS

Procedure

Upon approval from the UKMMC Scientific Research and Ethical Committee, theparticipants in this study were patients with type 2 diabetes with a medically confirmeddiagnosis of diabetes from the Diabetic Clinic of the Hospital Canselor Tuanku MuhrizUKM Medical Centre. Participants who met the criteria and agreed to participate in thisstudy were interviewed individually by the researcher whilst they were waiting for theirregular check-up appointment. Participants were surveyed using quantitativequestionnaires – Short Form 36 (*SF-36*) and Big Five Inventory (BFI).

Participants

A total of 200 participants aged between 30 and 70 years old were selected in this studybased on the inclusion and exclusion criteria. The inclusion criteria in this study wereparticipants who had been diagnosed with type 2 diabetes by general practitioners orhospital clinics, participants who attended regular check-up at Hospital Canselor TuankuMuhriz UKM Medical Centre, and also participants with the ability to communicate inBahasa Malaysia and English. The exclusion criteria in this study were participants whohad a history of stroke, dementia, alcohol or drug addiction problems as well asparticipants who were not able to communicate well in either language. The demographicdata of the participants were also recorded throughout this study.

DOI: 10.37200/IJPR/V24I4/PR201541
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

III. Instruments

Short Form - 36 (SF-36)

The health related quality of life of participants was assessed using Short Form-36(*SF-36*). SF-36 is usually divided into two major domains – PCS (Physical ComponentSummary) and MCS (Mental Component Summary) – and consists of eight sub-domains.The eight sub-domains include physical functioning, physical role limitation,emotionalrole limitation, social functioning, pain, mental health, vitality and general healthperception (Ware et al., 1993). The participants were given 15 minutes to answer the questionnaire. Thescoring for the SF-36 questionnaires was scaled from 0 to 100 in which a higher scoreindicated improved physical functioning and overall well-being while a lower scoreindicated a decrease in physical functioning and low quality of life. The SF-36questionnaire used in this study was modified and translated into a Bahasa Malaysiaversion by Sararaks et al. (2005) with a reliability value of more than 0.70 for each domain.

Big Five Inventory

The personality traits of participants were assessed using the Big Five Inventory, whichconsists of five domain characteristics – *Openness,* Conscientiousness, *Extraversion,Agreeableness* and *Neuroticism*. The participants were given 15 minutes to answer thequestionnaires. Based on the Likert scale score in the questionnaires, each of the itemswere calculated and divided into the five different sub-domains of the personality traits.The Big Five Inventory questionnaire used in this study was modified and translated byOng (2014) with a reliability value of more than 0.70 for each personality domain.

Data Analysis

Data were analysed using Statistical Package for the Social Sciences (SPSS) version 20.0.Descriptive data, such as participant's age, gender, marital status, religion, working status,duration of diabetes and type of treatment, were calculated based on the frequency andpercentage of the population. The correlation between personality and health related toquality of life were analysed using Pearson Correlation, while Multiple Linear Regressionusing the enter method was used to analyse the influence of personality on the healthrelated quality of life among type 2 diabetic patients.

IV. RESULTS

Table 1 shows the demographic data for the type 2 diabetic patients who participated in thisstudy. Most of the participants in this study were female (61.0%) as compared to maleparticipants (39.0%). In addition, 90.0% of the participants were married while 7.0%participants were widowed/divorced and 3.0% were single. The majority of the participantsin this study were Muslims (65.0%) followed by Hindus (16.0%), Buddhists (13.5%) andChristians (5.5%). Most of the participants in this study were employed (36.5%) ascompared to unemployed (34.0%) and retired participants (29.5%). Furthermore, most ofthe participants in this study had been diagnosed with diabetes for about 6

DOI: 10.37200/IJPR/V24I4/PR201541
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

to 10 years(49%) compared to participants who had been diagnosed with diabetes for less than 5 years(30.5%) or more than 10 years (20.5%). In addition, most of the participants in this studywere under insulin treatment (67.5%) while the remaining were participants who took oralmedication (21.5%) and both oral medication and insulin therapy (11.0%).

Table 1: Demographic Data of Type 2 Diabetic Patients

Demographic Variable	Frequency	Percentage
Age		
30-45	32	16.0
46-55	61	30.5
56-65	68	34.0
66-70	39	19.5
Gender		
Male	78	39.0
Female	122	61.0
Marital Status		
Married	180	90.0
Single	6	3.0
Widowed / Divorce	14	7.0
Religion		
Muslim	130	65.0
Buddhism	27	13.5
Hinduism	32	16.0
Christian	11	5.5
Working Status		
Employed	73	36.5
Unemployed	68	34.0
Retired	59	29.5
Duration of diabetes		
< 5 years	61	30.5
6 - 10 years	98	49.0
> 10 years	41	20.5
Type of treatment		
Oral medicine	43	21.5
Insulin	135	67.5
Oral medicine + insulin	22	11.0

DOI: 10.37200/IJPR/V24I4/PR201541
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

Table 2 shows that most of the *Openness*, *Conscientiousness*, *Extraversion* and*Agreeableness* scores in the Big-Five Inventory domain were positively correlated with thesub-domain of HRQOL, while the *Neuroticism* score was negatively correlated with mostof the sub-domain of HRQOL.

Table 2: Correlation between Personality and Quality of Life among patients with Type 2 Diabetes

	Openness (r)	Conscientiousness (r)	Extraversion (r)	Agreeableness (r)	Neuroticism (r)
Physical functioning	0.193**	0.197**	0.156**	0.018	-0.209**
Physical role	0.286**	0.287**	0.285**	0.227**	-0.278**
General Health	0.207**	0.187**	0.202**	0.149*	-0.196**
Vitality	0.317**	0.337**	0.340**	0.239**	-0.396**
Bodily Pain	0.180*	0.282**	0.246**	0.173*	-0.300**
Social functioning	0.181*	0.378**	0.315**	0.270**	-0.395**
Emotional role	0.222**	0.307**	0.283**	0.256**	0.262**
Mental health	0.257**	0.284**	0.248**	0.273**	-0.391**
PCS	0.289**	0.320**	0.294**	0.185**	-0.327**
MCS	0.295**	0.401**	0.363**	0.320**	-0.430**

(Notes : * $p<0.05$, ** $p<0.01$)

Table 3 shows the regression model between PCS and MCS of HRQOL with the Big FiveInventory. In general, the linear multiple regression model, PCS, and MCS domain ofHRQOL were classified as the dependent variable, while the Big Five Inventory domain(*Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness* and *Neuroticism*) wereclassified as the independent variables. The results show that 14.3% of the personalityvariation contributed to the PCS domain, while 24.3% of the personality variationcontributed to the MCS domain of HRQOL. In the PCS domain, the *Openness* item wassignificant and correlated with the physical component of patients' health related qualityof life, while, in the MCS domain, the *Agreeableness* and *Neuroticism* items were also significant and highly correlated with the mental component of patients' health relatedquality of life.

Table 3: General Linear Regression Model between Personality and Quality of Life (Physical Component Summary and Mental Component Summary) among patients with Type 2 Diabetes

Variable	B	std	beta	T	*p*	R^2	ΔR^2

DOI: 10.37200/IJPR/V24I4/PR201541
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

PCS						0.164	0.143
Constant	27.57	18.86		1.461	.146		
Openness	0.563	0.274	0.152	2.053	.041*		
Conscientiousness	0.816	0.516	0.140	1.583	.115		
Extraversion	0.263	0.288	0.076	0.915	.362		
Agreableness	0.102	0.371	0.021	0.275	.784		
Neuroticism	-0.434	0.244	-0.015	-1.775	.077		
MCS						0.262	0.243
Constant	22.09	18.05		1.224	.223		
Openness	0.338	0.262	0.090	1.287	.199		
Conscientiousness	0.708	0.493	0.120	1.435	.153		
Extraversion	0.304	0.276	0.087	1.102	.272		
Agreableness	0.777	0.355	0.154	2.186	.030*		
Neuroticism	-0.736	0.234	-0.250	-3.149	.002**		

(Notes : * $p<0.05$, ** $p<0.01$)

V. DISCUSSION

The objective of this study was to determine the correlation between personality andquality of life among type 2 diabetic patients. The behaviour or personality of individualswith chronic diseases like type 2 diabetes plays an important role in determining goodmetabolic control as well as improved physical and mental functions. Previous studiesshow that even though a self-management regimen improves the patients' quality of life,many diabetic patients struggle with their personality, particularly adherence behaviours (Ruggiero et al., 1997; Toljamo & Hentinen, 2001). In fact, poor blood glucose control and low quality of life were found amongpatients with low self-management behaviour (Bonds et al., 2003).

The findings of this study show that there is a positive correlation between the*Openness*, *Conscientiousness*, *Extraversion* and *Agreeableness* scores in the Big-FiveInventory domain with the sub-domain of HRQOL except for the correlation between thephysical functioning and *Agreeableness* score, while the *Neuroticism* score is negativelycorrelated with most of the sub-domain of HRQOL. This shows that higher scores in*Openness*, *Conscientiousness*, Extraversionand *Agreeableness* in the Big-Five Inventorydomain indicate an improved and positive health related quality of life, while an increase inthescore for *Neuroticism* is associated with a decrease in the health related quality of life.

Hence, this finding implies that personality influences the health related quality of lifeof diabetic patients. This is because diabetic patients with a positive personality, such ashigh in *Openness*, tend to think and act in non-conforming ways that might make it easierfor them to accept and cope with their condition, which would benefit and have a positiveimpact on their quality of life (Monique et al., 2011). In addition, *Conscientiousness* characteristics

DOI: 10.37200/IJPR/V24I4/PR201541
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

influencethe quality of life of individuals in a positive way by improving their self-control,discipline, and in following the advice of their physicians, especially in terms of diet,exercise and diabetes management (Bogg & Roberts, 2004).

In addition, *Extrovert* characteristics, such as being happy, cheerful, friendly,courageous and enthusiastic, influence the health related quality of life of individuals.This is because people who are *Extrovert* tend to be more social, friendly and engage inpeer relationships, which could indirectly help them to identify colleagues who areexperiencing the same problems in terms of their health status. Accordingly, they candiscuss among their colleagues and find solutions to problems related to their healthcondition. With such social support they would not feel alone and receive more socialsupport (Caspi et al., 2005), and have a higher tendency to experience more positive emotions, whichwould contribute to a better subjective well-being (Masthoff et al., 2007).In fact, individuals with*Agreeableness* characteristics have a high tolerance level and obey their physicians,which helps them in terms of their health related quality of life (Skinner et al., 2014).

However, *Neuroticism* characteristics, such as a high level of anxiety and depression,also influences the health related quality of life of diabetic patients. This is becauseindividuals with diabetes often feel that the disease is burdensome to them as it requiresspecial care in terms of metabolic control and lifestyle changes that would be stressful tocertain individuals, and, indirectly, lead to poor diabetes management and low quality of life. In fact, previous studies have found that depressive symptoms were often diagnosedamong type 2 diabetic patient, especially when the patient had to deal with more complextreatment or the development of diabetes complications (Golden et al. 2008; Pan et al. 2010; Engum et al. 2005). In addition, otherstudies have reported that *Neuroticism* is associated with poor health outcomes in patientswith diabetes, especially among patients with type 1 diabetes with poor glycaemic control (Weibe et al. 1994). However, patients with a low *Neuroticism* score tend to experience less emotionaldistress, which, indirectly, enable, them to minimize the long term consequences ofdiabetic complications through good diabetes management and glycaemic control (James et al. 2000).

Therefore, positive behaviour among type 2 diabetic patients, such as self-discipline,high compliance level and good social support, helps patients to accept their healthcondition in a positive perspective and reduce their perceived difficulty of adherencebehaviour. This finding is supported by previous literature that suggests that*Conscientiousness* characteristics have a positive effect on health behaviour (Brickman et al. 1996; Christensen & Smith 1995; Weiss & Costa 2005). This is because*Conscientiousness* characteristics are indirectly associated withindividuals with an increased compliance level and a better clinical outcome (Richard, 2012).This finding is similar to previous literature, which shows that the perspective ofdiabetic patients, coping skills, social factors, physical factors and the environment werethe most important elements that play a major role in changes to their lifestyle and overallwell-being (Gallant, 2003; Glanz et al. 1997). This indicates that individuals with good social-emotional supportusually demonstrate *Openness*, *Conscientiousness* and *Extrovert* characteristics, whichtend to have a positive outcome on overall health compared to individuals with poorsocio-emotional support, which is usually seen in patients with *Neuroticism* characteristics.

DOI: 10.37200/IJPR/V24I4/PR201541
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

This finding is supported by Westaway's study, which proves that better well-being isachieved with an improved socio-emotional support among patients with chronic diseases (Westaway et al. 2005).It is clearly shown that personality does influence the quality of life of patients, asImayama's study found that personality is one of the main predictors that affect thequality of life of diabetes patients (Imayama et al. 2011). These findings are also supported by the study ofRose, which shows that the quality of life of patients is affected by personality factorsthrough the use of coping strategies, mood and also the social support system of patients (Rose et al. 2002).

Therefore, personality does influence the health related quality of life of diabetic patients.Changes towards a positive attitude and behaviour among type 2 diabetic patients notonly improves the quality of life of diabetic patients, but also indirectly helps them toimprove their diabetes management. Furthermore, the findings of this study also raisesthe possibility that type 2 diabetes patients need psychological approaches towards apositive personality towards chronic illnesses. Concisely, both psychological approachesand diabetic treatment play an equal role in achieving good glycaemic control andimproved health related quality of life among type 2 diabetic patients.

VI. CONCLUSIONS

In a nutshell, personality plays a major role in influencing quality of life of a diabetic patient. This studies also have concluded that personality does influence patients'quality of life both physically and mentally. This clearly shows that, a positive attitude and behaviour has a positive impact on patients' quality of life in term of achieving good glycaemic control, improved diabetes management and indirectly reduce the long term of diabetic complications. While most of the diabetic patients with negative behaviour and attitude have more tendency to experience anxiety and stress which indirectly increase the diabetic complications due to poor glycaemic control and diabetes management. Therefore, a better understanding especially among diabetic patients on how a person's personality may influence both physically and mentally of the patients itself may solve most of the battle within that the patients are dealing with.

VII. RESEARCH IMPLICATIONS

Therefore, a better understanding and the importance of a person's personality on how they may impact the patients' health related quality of life is an extremely important aspect for the patients to know and to learn on how to deal with it. Lack of knowledge, exposure and awareness among diabetic patients on the importance of personality towards their health related quality of life leads to a poor diabetes management among them. This psychological aspect need to be taken a serious consideration on how to educate the patients about the importance of personality in influencing their quality of life both physically and mentally.

DOI: 10.37200/IJPR/V24I4/PR201541
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

VIII. ACKNOWLEDGEMENTS

We would like to thank all the diabetic patients who agreed to participate in our studyfrom the Diabetic Clinic of Hospital Canselor Tuanku Muhriz UKM Medical Centre, stafffrom the Endocrinology Department of Hospital Canselor Tuanku Muhriz UKMMC, DrAhmad Marzuki Omar and Prof Dr Nor Azmi Kamaruddin from the EndocrinologyDepartment of Universiti Kebangsaan Malaysia Medical Centre (UKMMC) for theirco-operation, help, support and guidance throughout this study. This study is funded byGrant Code No: GGPM-2012-100.

REFERENCES

1. International Diabetic Federation, Types of Diabetes (2013) http://www.idf.org/types-diabetes.
2. Kumar, V,, Fausto, N., Abbas, A.K., Cotran, R.S., Robbins, S.L. (2005). *Robbins and CotranPathologic Basis of Disease* (7th ed.). Philadelphia: Saunders. pg 194–1195.
3. Shaw, J.E., Sicree, R.A., Zimmet, P.Z. (2009). Global estimates of the prevalence ofdiabetes.*Diabetes research & practice*, 87(1): 46-54.
4. Institute for Public Health IPH (2015). National Health and Morbidity Survey 2015(NHMS 2015). Vol. II: Non-Communicable Diseases, Risk Factors & Other HealthProblems.
5. Loehlin, J.C., Willerman, L., Horn, J.M. (1988). Human behavior genetics. *Annual Reviewof Psychology*, 39(1): 101-133.
6. Costa, P.T., McCrae, R.R. (1992), *Neo PI-R professional manual*. Odessa, FL:Psychological.
7. John, O.P., Hampson, S.E., Goldberg, L.R. (1991). Is there a basic level of personalitydescription? *Journal of Personality and Social Psychology,* 60: 348-361.
8. Schacter, D.L., Gilbert, D.T., Wegner, D.M. (2011). *Psychology* (2nd ed.). Worth. pg 474–475.
9. John, O.P., Srivastava, S. (1999). *The Big Five trait taxonomy: History, measurement,and theoretical perspectives*. In: L. Pervin & O. P. John (Eds.) Handbook ofpersonality: Theory and research (2nd ed). New York: Guildford Press. pg. 102-138.
10. Mc Crae, R.R., Costa, P.T. (1999). *A five-factor theory of personality.* In L. A. Pervin &O. P. John (Eds), Handbook of personality. New York: Guilford. pg.139–153.
11. Christensen. A.J., Smith, T.W. (1995). Personality and patient adherence: Correlates offive-factor model in renal dialysis. *Journal of Behavioral Medicine*, 18: 305-313.
12. Christensen, A.J., Moran, P.J., Wiebe, J.S. (1999). Assessment of irrational health beliefs: Relation to health practices and medical regimen adherence. *Health Psychology*, 18: 169-176.
13. Brickman, A.L., Yount, S.E., Blaney, N.T., Rothberg, S.T., De-Nour, A.K. (1996). Personalitytraits and long-term health status: The influence of neuroticism andconscientiousness on renal deterioration in type-1 diabetes. *Psychosomatics*, 37:459-468.
14. Lauriola, M., Levin, I.P. (2001). Relating individual differences in attitude towardambiguity to risky choices. *Journal of Behavioral Decision Making*, 14(2): 107-122.
15. Shekelle, R.B., Vernon, S.W., Ostfeld, A.M. (1991). Personality and coronary artery disease.*Psychosomatic*

Medicine, 43: 117-125.

16. Prasenjit Mondal, Shravanthi Nannapu, Pooja Adi, Swapna Naredla, Harish Peruka (2016) A Review On Duopa–A New Antiparkinsonian Combination As Enteral Suspension. Journal of Critical Reviews, 3 (2), 1-5.
17. Ware, J.E., Snow, K.K., Kosinski, M., Gandek, B. (1993). *The SF36 Health SurveyManual and Interpretation Guide*. Boston, Massachusetts: The Health Institute, NewEngland Medical Center.
18. Sararaks, S., Azman, A.B., Low, L.L., Rugayah, B., Aziah, A.M., Hooi, L.N., et al. (2005). Validity and reliability of the SF-36: The Malaysian context. *Med J Malaysia*, 60(2)163–179.
19. Ong, C.H. (2014). Validity and reliability of the Big Five Personality Traits Scale inMalaysia. *International Journal of Innovation and Applied Studies*, 5(4): 309–315.
20. Ruggiero, L., Glasgow, R.E., Dryfoos, J.M., et al. (1997). Diabetes self-management:Self-reported recommendations and patterns in a large population. *Diabetes Care*, 20:568–576.
21. Toljamo, M., Hentinen, M. (2001). Adherence to self care and glycaemic control among people with insulin dependent diabetes mellitus. *Journal of Advanced Nursing*, 34: 780-786.
22. Bonds, D.E., Zaccaro, D.I., Karter, A.J., Selby, J.V., Saad, M., Goff, D.C. (2003). Ethnic andracial differences in diabetes care. *Diabetes Care*, 26: 1040–1046.
23. Monique, O.M., Van, D.V., Rutger, C.M.E. (2011). Quality of life of adolescents withasthma: The role of personality, coping strategies and symptom reporting. *Journal of Psychosomatic Research*, 71: 166–173.
24. Bogg. T., Roberts, B.W. (2004). Conscientiousness and health-related behaviors: Ameta-analysis of the leading behavioral contributors to mortality. *Psychol Bull*,130: 887-919.
25. Caspi, A., Roberts, B.W., Shiner, R.L. (2005). Personality development: Stability andchange. *Annual Review of Psychology*, 56: 453-484.
26. Masthoff, E.D., Trompenaars, F.J., Van Heck, G.L., Hodiamont, P.P., De Vries, J. (2007). Therelationship between dimensional personality models and quality of life in psychiatric outpatients. *Psychiatry Research*, 149: 81-88.
27. Skinner, T.C., Bruce, D.G., Davis, T.M.E., Davis, W.A. (2014). Personality traits, self-carebehaviours and glycaemic control in Type 2 diabetes: The Fremantle Diabetes StudyPhase II. *Diabetic Medicine*, 31: 487-492.
28. Golden, S.H., Lazo, M., Carnethon, M., et al. (2008). Examining a bidirectionalassociation between depressive symptoms and diabetes. *JAMA*, 299(23): 2751-9.
29. Pan, A., Lucas, M., Sun, Q., et al. (2010). Bidirectional association between depressionand type 2 diabetes mellitus in women, *Arch Intern Med*, 170(21): 1884-91.
30. Engum, A., Mykletun, A., Midthjell, K., et al. (2005). Depression and diabetes: A largepopulation-based study of sociodemographic, lifestyle, and Clinical factorsassociated with depression in type 1 and type 2 diabetes. *Diabetes Care*, 28: 1904-9.
31. Patel PB, Shastri DH, Shelat PK, Shukla AK. "Ophthalmic Drug Delivery System: Challenges and

DOI: 10.37200/IJPR/V24I4/PR201541
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

Approaches." Systematic Reviews in Pharmacy 1.2 (2010), 114-120. Print. doi:10.4103/0975-8453.75042

32. Weibe, D.J., Alderfer, M.A., Palmer, S.C., Lindsay, R., Jarrett, L. (1994). Behavioralself-regulation in adolescents with type I diabetes: negative affectivity and bloodglucose symptom perception. *J Consult Clin Psychol*, 62:1204–1212.
33. James, D.L., Cynthia, C.M., Paula, G.W., Priti, I.P., Mark, N.F., Richard, S.S. (2000), PersonalityCorrelates of Glycemic Control in Type 2 Diabetes. *Diabetes Care*, 23:1321–1325.
34. Weiss, A., Costa, P.T. Jr. (2005). Domain and facet personality predictors of all-causemortality among Medicare patients aged 65 to 100. *Psychosom Med*, 67: 724–33.
35. Richard, S. (2012). Personality traits predict compliance with type 2 diabetesregimens. *Journal of Diabetes Nursing*, 16(7): 295.
36. Gallant, M.P. (2003). The influence of social support on chronic illnessself-management: A review and directions for research. *Health Education & Behavior,The Official Publication of the Society for Public Health Education*, 30(2):170-195.
37. Glanz, K., Lewis, F.M., Rimer, B.K. (1997). *Health behaviour and health education:Theory, research, and practice*, San Francisco, Jossey-Bass.
38. Westaway, M., Seager, J., Rheeder, P., Van Zyl, D. (2005). The effects of socialsupport on health, well-being and management of diabetes mellitus: A black SouthAfrican perspective. *Ethnicity and Health*,10: 73–89.
39. Imayama, I., Plotnikoff, R.C., Courneya, K.S., Johnson, J.A. (2011). Determinants ofquality of life in adults with type 1 and type 2 diabetes. *Health and Quality of LifeOutcomes*, 9(1): 115-201.
40. Myasoutova, L.I., Myasoutova, E.R., Tarzimanova, A.I.Chameleon disease in rheumatology(2018) International Journal of Pharmaceutical Research, 10 (1), pp. 320-322. https://www.scopus.com/inward/record.uri?eid=2s2.085059622471&partnerID=40&md5=2c5024763e1bdc078fbe819e4c38a73d
41. Rose, M., Fliege, H., Hildebrandt, M., Schirop, T., Klapp, B.F. (2002). The network ofpsychological variables in patients with diabetes and their importance for quality of lifeand metabolic control. *Diabetes Care*, 25: 35-42.
42. Dr. Srivastava, S., Srivastava, K., Pandey, A.,&Sharma, A. (2014). Data Mining in Telecommunication Industries. *International Journal of Advances in Engineering and Emerging Technology*, 5(2), 75-79.
43. Mohankumar,T. (2014). Area-Efficient and High Speed Carry Select Adder. *Excel International Journal of Technology, Engineering and Management*, 1(4), 108-111.
44. Vimal, R.L.P.Towards a theory of everything part III: Introduction of consciousness in loop quantum gravity and string theory and unification of experiences with fundamental forces(2010) NeuroQuantology, 8 (4), pp. 571-599.
45. Ingber, L.Statistical mechanics of neocortical interactions nonlinear columnar electroencephalography(2009) NeuroQuantology, 7 (4), pp. 500-529

DOI: 10.37200/IJPR/V24I4/PR201541
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020