

# **In-dept review on adherence to therapeutic regimen and well-being among patients with type II diabetes mellitus**

**<sup>1</sup>Gloria Shiela E. Coyoca,<sup>1</sup>Hanna Claire P. Bejarasco, <sup>1</sup>Veron Gem T. Dalumbar, <sup>1</sup>Eldon S. Mendoza**

Mindanao State University – Iligan Institute of Technology College of Nursing Andres Bonifacio Avenue, Tibanga, Iligan City, 9200 Philippines

Corresponding author: gloriashiela.coyoca@g.msuiit.edu.ph

**Abstract:** Diabetes Mellitus or diabetes is an aggregation of metabolic diseases distinguished as a condition occurring when the body can't utilize glucose from the foods eaten. In 2011, 366 million were diagnosed with diabetes mellitus with 4.6 million deaths and 50% among which are undiagnosed. According to the International Diabetes Federation in 2011, diabetes is expected to rise by about 552 million by the year 2030. Patient nonadherence can be a pervasive threat to health and well-being and carries an appreciable economic burden as well, yet, only few studies have been conducted to examine the relationship between adherence to therapeutic regimen and well-being among type 2 diabetic individuals. The main intention of this study is to provide an in-depth review of the relationship between the adherence to therapeutic regimen and well-being among type 2 diabetic individuals in Iligan City. Descriptive Correlational design was utilized to describe the relationship between the variables under investigation. Modified standardized questionnaires were given to 133 respondents who were chosen using a simple random sampling. Results showed that among the therapeutic regimen adherence investigated, most of the respondents have an average level of adherence to diet compared to medication, exercise, and stress reduction techniques in which their level of adherence scored good. For their well-being status, only mental scored good, while physical, emotional and spiritual scored average. Furthermore, findings showed a significant inverse relationship between age of respondents and their level of adherence to diet, the respondents' work status and their level of adherence to diet and stress reduction techniques. Positive significant relationship was found between the respondents' educational attainment and their level of adherence to therapeutic regimen, economic status and medication adherence, and educational attainment and mental well-being. Therefore, therapeutic regimen adherence was found to have a positive impact on the well-being of the respondents. Collaborative team consisting of endocrinologists, nurses, nutritionists, dieticians, exercise physiologists, and spiritual leaders is highly recommended for the intensive management of diabetes patients, thus, improving adherence and well-being.

**Keywords:** Adherence, Diabetes Mellitus, Therapeutic Regimen, Well - being

## **Introduction**

In Philippines, the International Diabetes Federation in 2009 had listed 1.4 million Filipino adults aged 20 and above to have acquired the condition in the last five years (Pazzibugan, D., 2009), putting the census for Filipino type II diabetics at 3.4 million, with 4.9 million more at the brink of developing diabetes (Tacadao, M., 2011). Diabetes is a challenging disease to successfully manage. Regimen adherence problems are common in individuals with diabetes, and adherence to therapeutic regimen in patients with type 2 diabetes could vary widely. Being diagnosed and living with diabetes may affect the well-being of the patient. Many would feel abandoned and discarded which may affect their holistic health status and perseverance to follow therapies prescribed by the physician. Hence, this study

was conducted to explore the effects of adherence or non-adherence to therapeutic regimen to the mental, physical, emotional, and spiritual well-being of diabetic patients.

### **Materials and Methods**

This study utilized a Descriptive Correlational design for it sought to describe the adherence to therapeutic regimen of type II diabetes mellitus patients. This study also examined the extent of relationship between the adherence of therapeutic regimen of type II diabetic individuals and its effect on their well-being. The respondents of this study consisted of 133 type II diabetes mellitus patients selected through simple random sampling technique, 55 of whom were used in the pilot study. In this study, the researchers utilized a modified standardized questionnaires which were given to 133 respondents.

### **Results and Discussion**

**Table 1. Demographic Profile**

	Demographic Profile	Frequency	Percentage(%)
Age	Below 50 years old (32- 50 years old	19	14.3
	51- 55 years old	13	9.8
	56- 60 years old	19	14.3
	61- 65 years old	29	21.8
	66- 70 years old	16	12.0
	71- 75 years old	17	12.8
	76 years old and above	20	15.0
Gender	Male	77	57.9
	Female	56	42.1
	Single	6	4.5
Civil Status	Married	84	63.2
	Separated/ Annulled	9	6.8
	Widow (er)	34	25.6
Educational Attainment	Elementary Level	31	23.3
	Elementary Graduate	32	24.1

Work Status	High School Level	31	23.3
	High School Graduate	20	15
	College Level	11	8.3
	College Graduate	8	6
Economic Status	Working	50	37.6
	Non- Working	83	62.4
	< Php 500/month	9	6.8
	Php 1,000- Php 4,000/ month	43	32.3
Religion	Php5,000- Php 10, 000/ month	48	36.1
	>Php 10, 000/ month	29	21.8
	Others (no income)	4	3
	Roman Catholic	104	78.2
Total	Muslim	9	6.8
	Seventh- Day Adventist	6	4.5
	Baptist	3	2.3
	Protestant	9	6.8
	Iglesia ni Cristo	2	1.5
		133	100

Based on the above table, aged 61 – 65 years, got the highest frequency of 29 (21.8%), this result is in line with Roger, V.L. et al.'s (2012) in which the outcome of his study, found out that adults have increased number of people diagnosed with diabetes mellitus. With regards to the gender of the respondents, males outnumbered females. This result is in parallel with the study done by the National Diabetes Information Clearinghouse (2011) in which it asserted that diabetes is more prone in males than in females. For the civil status, married individuals have the highest frequency which is 84 (63.2%); lowest in number are the single individuals who are 6 (4.5%) only. This result contradicts the reports of CBC News- New York (2009) and of Parker-Pope, T. (2010) that the separated populace and those with marital discord have the most increased number of diabetics. Educational attainment result, matches the outcomes from the study conducted by Reither, E.N. et al. (2009) stating that educated persons exhibit lower rates of diabetes than those with lesser

education, and that lower educational attainment has been strongly linked to higher diabetes mellitus prevalence. Working status findings is confirmed by Singh, R.'s (2007) assertion that diabetic clients have increased number of unemployed or non-working individuals. Economic status findings is somehow in parallel to the outcome of Rabi, D.M. et al.'s (2006) and Wild, S. et al.'s (2008) studies. Both studies stated that low socioeconomic status is linked to higher incidences of diabetes mellitus.

**Table 2. Adherence to Therapeutic Regimen of the Respondents**

Level of Therapeutic Regimen	Medication	Diet	Exercise	Stress Reduction Techniques
Poor	1 (0.8%)	1 (0.8%)	0 (0%)	3 (2.3%)
Fair	3 (2.3%)	9 (6.8%)	18 (13.5%)	1 (.8%)
Average	21 (15.8%)	54 (40.6%)	47 (35.3%)	21 (15.8%)
Good	59 (44.4%)	41 (30.8%)	61 (45.9%)	57 (42.9%)
Very Good	49 (36.8%)	28 (21.1%)	7 (5.3%)	51 (38.3%)
Total	133 (100%)	133 (100%)	133 (100%)	133 (100%)

The results show that among the four therapeutic regimens, only dietary regimen had an average result while the rest have good level of adherence rating. This rejects the studies of Odegard, P. and Capoccia, K. (2007), DiMatteo, M. (2004).which pronounced that generally, patients fail to follow treatment recommendations.

**Table 3. Well-being of the Respondents**

Level of Well-being	Mental	Physical	Emotional	Spiritual
Poor	1 (0.8%)	1 (0.8%)	1 (0.8%)	1 (0.8%)
Fair	2 (1.5%)	3 (2.3%)	9 (6.8%)	10 (7.5%)
Average	43 (32.3%)	71 (53.4%)	63 (47.4%)	72 (54.1%)
Good	71 (53.4%)	57 (42.9%)	57 (42.9%)	42 (31.6%)
Very Good	16 (12%)	1 (0.8%)	3 (2.3%)	8 (6%)
Total	133 (100%)	133 (100%)	133 (100%)	133 (100%)

Majority of the respondents have a good level of mental well-being, while having an average level of physical, emotional and spiritual well – being. This is in contrast to Peyrot, M. et al. 2004.

**Table 4.1** Computed Correlation Coefficient for the Relationship between age, educational attainment, work status, economic status of Respondents and their Adherence to Therapeutic Regimen

	Computed Pearson/ Computed Spearman Rank/ Computed Bi-Serial Correlation Coefficient	P-Value	Remark
*Age versus Diet	-0.183		
*Educational vs. Medication Attainment	0.280	0.035	Significant
*Educational Attainment versus Diet	0.281	0.001	Significant
*Educational Attainment versus Exercise	0.242	0.001	Significant
*Educational attainment versus Stress Reduction Techniques	0.205	0.005	Significant
*Work Status versus Diet	-0.310	0.018	Significant
*Work Status versus Stress Reduction Techniques	-0.179	0.000	Significant
*Economic Status versus Medication	0.190	0.039	Significant
		0.029	Significant

**Legend:** If P-value is less than  $\alpha = 0.05$  (level of significance), then the test is significant (i.e., there is a significant relationship); The computed value of the coefficient of correlation at -0.183 implied that there was a significant inverse relationship between the age of respondents and their level of adherence to dietary regimen. Hence, as the age increases, the level of adherence to dietary regimen decreases. This is in parallel with studies by Patton, S.R. et al. (2007), Patton, S.R. (2011), and Soban, M. (2007) which indicated that age is a factor to adherence in dietary regimen wherein younger patients are found out to adhere more to dietary regimen. Educational attainment of the respondents affects their level of adherence to medication, diet, exercise, and stress reduction techniques. This result

is confirmed by Prof. R. Danielson (2011), Alguwaihes, A. (2009) which indicated that educational attainment affects adherence to the therapeutic regimen. Meanwhile, work status inversely affects the respondent's level of adherence to diet and stress reduction techniques. This finding is strengthened by the study of Chan, M. et al. (2012). Positive significant relationship is found between the economic status & level of adherence to medication. This finding is in parallel to Delamater, A.'s (2006) and Dawood, et al.'s (2009) studies.

**Significant Relationship Between the Respondents level of Adherence to Therapeutics Regimen and Their Weel-being**

Table 6. Computed Correlation Coefficient for the Relationship between the Respondents' Adherence to Therapeutic Regimen and their Mental, Physical, Emotional, and Spiritual Well-being

			Computed Pearson Correlation Coefficient	P-Value	Remark
Diet versus	Mental		0.365	0.000	Significant
	Physical		0.289	0.001	Significant
	Emotional		0.365	0.000	Significant
	Spiritual		0.454	0.000	Significant
Medication vs.	Mental		0.285	0.001	Significant
	Physical		0.171	0.049	Significant
	Emotional		0.257	0.003	Significant
	Spiritual		0.193	0.026	Significant
Exercise versus	Mental		0.253	0.003	Significant
	Physical		0.234	0.007	Significant
	Emotional		0.251	0.004	Significant
	Spiritual		0.316	0.000	Significant
Stress Reduction	Mental		0.515	0.000	Significant
Techniques versus	Physical		0.280	0.001	Significant
	Emotional		0.501	0.000	Significant
	Spiritual		0.505	0.000	Significant

Table 6 implies that the respondents' level of adherence to diet regimen affects their levels of mental, physical, emotional, and spiritual well-being. This result is confirmed by Zrinyi, M. et al. (2003), & Saatci, E. et al. (2010) which all asserted that gaining optimal nutrition & adherence to dietary regimen lead to increase in overall well-being. Adherence to medication result is in parallel with the study conducted by Hommel, K.A. et al. (2008). Also, there is a significant direct relationship between the respondents' level of adherence to exercise regimen and their levels of mental, physical, emotional, and spiritual well-being. This outcome supports the assertions from Cleveland Clinic, 2012. In addition, the table shows that there is a significant direct relationship between the respondents' level of adherence to stress reduction techniques and their levels of mental, physical, emotional, and spiritual well-being. This result sustains the conclusions made by the Cleveland Clinic (2009), which stated that adherence to stress reduction techniques improves the well-being.

## **Conclusions**

This study in general, have found out that adherence to medication, diet, exercise and stress reduction techniques affects the mental, physical, emotional and spiritual well-being of diabetic individuals. Other significant findings of this study include age and adherence to diet have an inverse significant relationship, while there is a direct positive relationship between educational attainment & adherence to diet, medication, exercise & stress reduction techniques. Moreover, economic status also affects their adherence to medication. However, there is an inverse significant relationship between work status and diet and stress reduction techniques, hence, if the respondent is working, the respondent tends to have low levels of adherence to diet and stress reduction techniques.

## **References**

- Aspden, P. (2007, July 26). Failure to Cap IV Tubings and Disinfecting IV Ports Place Patients at Risk for Infection. Institute for Safe Medication Practice. Retrieved May 18, 2012 from <http://www.ismp.org/newsletters/acutecare/articles/20070726.asp>
- Alguwaihes, A. and Shah, B. (2009). Educational Attainment is Associated with Health Care Utilization and Self-Care Behavior by Individuals with Diabetes. *The Open Diabetes Journal*, 2, 24- 28. Retrieved on October 13, 2012.
- CBC News- New York (2009, July 28). Divorce May Make You Sick. [www.365reasons.com](http://www.365reasons.com). Retrieved on March 3, 2013, from <http://www.365reasons.com/health.htm>.
- Chan, M., Zalilah, M., Hii, S. (2012, August 3). Determinants of Compliance Behaviors among Patients Undergoing Hemodialysis in Malaysia. *PLoS One*, 7 (8). Retrieved on October 13, 2012.
- Cleveland Clinic (2009, March 3). Emotional Well-Being. [my.clevelandclinic.org](http://my.clevelandclinic.org). Retrieved on November 9, 2012, from [http://my.clevelandclinic.org/healthy\\_living/stress\\_management/hic\\_stress\\_management\\_and\\_emotional\\_health.aspx](http://my.clevelandclinic.org/healthy_living/stress_management/hic_stress_management_and_emotional_health.aspx).

- Cleveland Clinic. (2012). Heart and Vascular Health & Prevention. my.clevelandclinic.org. Retrieved on November 9, 2012, from <http://my.clevelandclinic.org/heart/prevention/exercise/exercisehrt.aspx>.
- Danielson, R. (2011). Chapter 2: Factors in Continued Exercise Behaviors: Exercise Adherence. Danielson.laurentian.ca Retrieved on October 13, 2012, from <http://danielson.laurentian.ca/drnotes/epsych02.htm>
- Dawood, O., Ibrahim, M., and Palaian, S. (2009, December 23). Medication compliance among children. World Journal of Pediatrics. Retrieved on October 13, 2012.
- Delamater, A. (2006, Nov. 2). Improving Patient Adherence. Clinical Diabetes, 24, 70-77. Retrieved on October 13, 2012.
- DiMatteo, M. R. (2004). Social support and patient adherence to medical treatment: a meta-analysis. Journal of the American Academy of Physician Assistants, 17 (11), 18-21. Retrieved on August 30, 2012.
- Hommel, K.A., Davis, C.M., and Baldassano. R.N. (2008). Medication Adherence and Quality of Life in Pediatric Inflammatory Bowel Disease. Journal of Pediatric Psychology, 33 (8), 867-874. Retrieved on November 8, 2012.
- International Diabetes Federation (2011). The Global Burden. www.idf.org. Retrieved on August 29, 2012 from <http://www.idf.org/diabetesatlas/5e/the-global-burden>
- Odegard, PS, and Capoccia, K. (2007). Medication Taking and Diabetes : A Systematic Review of the Literature. The Diabetes Educator, 2007( 33), 1014. Retrieved on September 1, 2012.
- Parker-Pope, T. (2010, April 14). Is Marriage Good for Your Health? www.nytimes.com. Retrieved on March 3, 2013, from [http://www.nytimes.com/2010/04/18/magazine/18marriage-t.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2010/04/18/magazine/18marriage-t.html?pagewanted=all&_r=0).
- Patton, SR., Dolan, LM., and Powers, SW. (2007, January). Dietary Adherence and Associated Glycemic Control in Families of Young Children with Type 1 Diabetes Mellitus. Journal of the American Dietetic Association, 107 (1), 46-52. Retrieved on October 9, 2012.
- Patton, SR. (2011, April). Adherence to Diet in Youth with Type 1 Diabetes. Journal of the American Dietetic Association, 111 (4), 550-555. Retrieved on October 9, 2012.
- Pazzibugan, D. (2009, October 29). 4.9M Filipinos Risk Contracting Diabetes. newsinfo.inquirer.net. Retrieved on September 2, 2012, from <http://newsinfo.inquirer.net/breakingnews/nation/view/20091029-232942/49M-Filipinos-risk-contracting-diabetes#>
- Peyrot, M., Rubin, R. R., Lauritzen, T., Snoek, F. J., Matthews, D. R., and Skovlund, S. E. (2004). Psychosocial problems and barriers to improved diabetes management: results of the Cross-National Diabetes Attitudes, Wishes and Needs (DAWN) Study on behalf of the International DAWN Advisory Panel. Diabetic Medicine DME Oxford: UK Blackwell Publishing, Ltd.
- Rabi, D.M. Edwards, A.L., Southern, D.A., Svenson, L.W., Sarqious, P.W., Norton, P., Larsen, E.T., and Ghali, W.A. (2006, October 3). Association of Socioeconomic Status with Diabetes



- Prevalence and Utilization of Diabetes Care. *BMC Health Services Research*, 6, 124. Retrieved on March 3, 2013.
- Reither, E.N., Fedor, T.M., Abel, K.M., and Hatch, D.J. (2009). Association between Educational Attainment and Diabetes in Utah: The Behavioral Risk Factor Surveillance System, 1996-2007.
- Utah's Health: An Annual Review, 14, 42-51. Retrieved on March 3, 2013
- Roger, V.L., Go, A.S., Lloyd-Jones, DM, Benjamin, E.J., Berry, J.D., Borden, W.B., Bravata, D.M., Dai, S., Ford, E.S., Fox, C.S., Fullerton, H.J., Gillespie, C., Hailpern, S.M., Heit, J.A., Howard, V.J., Kissela, B.M., Kittner, S.J., Lackland, D.T., Lichtman, J.H., Lisabeth, L.D., Makuc, D.M., Marcus, G.M., Marelli, A., Matchar, D.B., Moy, C.S., Mozaffarian, D., Mussolino, M.E., Nichol, G., Paynter, N.P., Soliman, E.Z., Sorlie, P.D., Sotoodehnia, N., Turan, T.N., Virani, S.S., Wong, N.D., Woo, D., Turner, M.B.; on behalf of the American Heart Association Statistics Committee and Stroke Statistics Subcommittee (2012). Heart Disease and Stroke Statistics—2012 Update: A Report from the American Heart Association. [www.heart.org](http://www.heart.org). Retrieved on March 3, 2013.
- Saatci, E., Tahmiscioglu, G., Bozdemir, N., Akpinar, E., Ozcan, S., and Kurdak, H. (2010, July 13). The well-being and treatment satisfaction of diabetic patients in primary care. *Health and Quality of Life Outcomes*, 2010 (8), 67. Retrieved on August 27, 2012.
- Singh, R. (2007, March 8). Employment in Working Age Men with Diabetes Mellitus. *Practical Diabetes International*, 24 (2), 75-77. Retrieved on March 3, 2013.
- Soban, M. (2007). Dietary Adherence Among Older Community Living Adults in Central North Carolina to Specific Dietary Recommendations of the 2005 Dietary Guidelines for Americans. [www.libres.uncg.edu](http://www.libres.uncg.edu). Retrieved on October 9, 2012, from <http://libres.uncg.edu/ir/uncg/f/umi-uncg-1333.pdf>
- Tacadao, M. (2011, August 28). Diabetes: A Silent Killer Disease. [www.thepoc.net](http://www.thepoc.net). Retrieved on September 21, 2012, from <http://www.thepoc.net/thepoc-features/health-and-wellness/health-and-fitness-features/13365-diabetes-a-silent-killer-disease.html>
- Wild, M., Engleman, H., Douglas, N., and Espie, C. (2008, September). Can psychological factors help us to determine adherence to CPAP? A prospective study. *European Respiratory Journal*, 24 (3), 461-5. Retrieved on October 13, 2012.
- Zrinyi, M., Juhasz, M., Balla, J., Katona, E., Ben, T., Kakuk, G., and Pall, D. (2003). Dietary self-efficacy: determinant of compliance behaviours and biochemical outcomes in haemodialysis patients. *Nephrology Dialysis Transplantation*, 18, 1869-1873. Retrieved on November 9, 2012.