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RESEARCH ARTICLE

DIABETES MANAGEMENT: A STUDY IN RELATION TO PERSONALITY,  
SELF EFFICACY AND GENDER

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ABSTRACT

The purpose of this research was to evaluate the role of diabetes management in relation to personality, self efficacy and gender. Diabetes management has been considered with respect to diet, exercise, glucose testing and medication. Diabetes mellitus especially type 2 is very fast growing disease and common in more developing countries. The total sample of the study consists of 80 (40 male and 40 female) medically diagnosed as a type 2 diabetes mellitus patients at different diabetes clinics of Raipur city of Chhattisgarh state, coming from 25 to 75 yrs age group. For diabetes management the summary of diabetes self care activities (SDSCA) by Toobert and Glasgow (1994) was utilized to evaluate self care practices of type 2 diabetes patients. To assess self efficacy and personality factor, diabetes empowerment scale and 16 PF questionnaires were used respectively. Regression analysis was computed to analyze data. It is observed that self efficacy and gender doesn't play significant role in SDSCA total and self care behavior is equally given importance in both genders. Higher level of ego strength (factor C) and self discipline (factor Q<sub>3</sub>) were associated with higher level of self care behavior. Best predictors for diet are insecurity (factor O) and self discipline (factor Q<sub>3</sub>) was positively significant. Best predictors for exercise are warmth (factor A) and shrewdness (factor N) was negatively significant. Best predictor for glucose testing is impulsivity (factor F) was positively significant and best predictors for medication are intelligence (factor B), ego strength (factor C) and tension (factor Q<sub>4</sub>) was positively significant.

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INTRODUCTION

Diabetes mellitus is a chronic medical illness presenting a potential risk for multiple life threatening medical complication, including blindness, kidney failure, limb amputation, heart disease and stroke. Globally as of 2010, it is estimated that there are 285 million people diabetes with Type 2 making up about 90% of the cases. Its incidence is increasing rapidly and it is estimated that by 2030, this number will almost double. Type 2 diabetes mellitus also known as "noninsulin dependent" diabetes is prevalent among approximately 90% of diabetic patient (Goner Frederik Cox and Clarke, 2002). Type 2 diabetes mellitus is usually associated with age and obesity typically being diagnosed among middle age and older adults. The main goal of diabetes management is to restore carbohydrate metabolism to as close to a normal state as possible. The treatment goals for Type 2 diabetes patients are related to effective control of blood glucose, blood pressure and lipids to minimize the risk of long term consequence associated with diabetes.

Bell *et al.* (1998) studied that body fat, fat distribution and psychosocial factors among patients with Type 2 diabetes mellitus and finding suggested that stress was associated with body mass index and negative mood was associated with the waist hip ratio (WHR) and stress and affect may be important correlated of body fat among women with Type 2 diabetes, leading to more complications. Lieberman (2003) investigated that the processes of modernization or globalization include the availability and abundance of calorically dense/ low fiber / high glycemic food and the adoption of sedentary and found that effect of evolutionary and modernizing influences leading to obesity among both children and adults in developed and developing countries. Costacou and Davis (2003) studied that the nutrition and prevention of Type 2 diabetes and found that effect of diet on insulin resistance insulin secretion and glucose tolerance is to be positive. Schulze and Hv (2005) studied the primary prevention of diabetes and reported that Type 2 diabetes can be prevented largely through moderate diet and lifestyle modification. Magkos *et al.* (2009) studied that the management of the metabolic syndrome and Type 2 diabetes through lifestyle modification and result found that adopting a healthy lifestyle pattern requires a series of long term behavior changes it includes changes in diet and physical activity are the

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initial and often the primary component for the management of diabetes and metabolic syndrome. Holloszy and Kohrt (1996) examined that glycogen stores plays a major role in determining new long vigorous endurance exercise. During vigorous exercise carbohydrate in the form of muscle glycogen & blood glucose is the primary energy source.

Dhurandher and Shrivastav (2013) found that percentage of female showing dominance of shrewd characteristic was higher than male diabetes. Female were also high on self sufficient than male diabetes patients. Aljaseem *et al.* (2001) investigated the role of self efficacy judgments within the expanded health beliefs model they reported that the appraisals of self efficacy accounted for over 10% of the variance in self care behaviors when statistically controlling for diabetes specific treatment barriers and patients characteristics. Williams and Bond (2002) found that self efficacy beliefs assessed among 94 diabetic patients accounted on average for over 26% of the variance in their self care behaviors including diet, exercise and blood glucose testing. Skarbek (2006) reported that the self efficacy as measured by the DES was a significant predictor of only one of the component of diabetes self care regimen specifically, self efficacy accounted for 9% of the variance in the exercise component of the diabetes regimen.

Cohen *et al.* (2005) explained that the attachment orientation and spouse support in adults with Type 2 diabetes and found that a negative association between attachment avoidance and both positive and negative support, among patients scoring high on avoidance the duration of diabetes was associated with increase in HbA1c level. Dhurandher and shrivastav (2013) studied personality predictors of diabetes management type 2 and found that the positive relationship on Factor III indicates that the male patients who are enterprising, decisive and resilient personality will be better diet management among male diabetes patients. The main objective of this study is to find out the relationship of diabetes management with personality, self efficacy and gender and aim to explore the best predictor of diabetes self care, specifically in type 2 diabetes mellitus.

## Research Design and Method

### Sample

The total sample of the study consists of 80 (40 male & 40 female) Type 2 diabetes mellitus patients of Raipur city, coming from age group 25 to 75, of various diabetes clinics.

### Design

The study is correlational type of research including, Dependent Variable as diabetes management and its components (diet, exercise, glucose-testing & medication) and Independent variable, as personality 16 factors, gender (male & female) and self efficacy and its 3 dimensions (managing psychosocial aspects of diabetes ,assessing dissatisfaction and readiness to change , and setting & achieving goals).

### Tools

To assess personality the 16 PF questionnaires, Hindi edition 1981, developed by Kapoor and Tripathi. The 16PF test was

constructed by Raymond B. Cattell and Herbert W. Eber. The 16 PF questionnaire measures 16 personality traits each personality trait has bipolar category.

| BIOPOLAR CATEGORY  |                 |                   | LETTER SYMBOL  |
|--------------------|-----------------|-------------------|----------------|
| LOW                | PRIMARY FACTOR  | HIGH              |                |
| - Reserved         | Warmth          | Outgoing          | A              |
| - Less intelligent | Intelligence    | More intelligence | B              |
| - Stable ego       | Ego strength    | Emotionality      | C              |
| - Strength         |                 |                   |                |
| - Humble           | Dominance       | Assertive         | E              |
| - Sober            | Impulsivity     | Happy-go-lucky    | F              |
| - Expedient        | Conformity      | Conscientious     | G              |
| - Shy              | Boldness        | Venture some      | H              |
| - Tough minded     | Sensitivity     | Tender Minded     | I              |
| - Trusting         | Suspiciousness  | Suspicious        | L              |
| - Practical        | Imagination     | Imaginative       | M              |
| - Forthright       | Shrewdness      | Shrewd            | N              |
| - Placid           | Insecurity      | Apprehensive      | O              |
| - Conservative     | Radicalism      | Experimenting     | Q <sub>1</sub> |
| - Group tied       | Self sufficient | Self Sufficient   | Q <sub>2</sub> |
| - Casual           | Self discipline | Controlled        | Q <sub>3</sub> |
| - Relaxed          | Tension         | Tense             | Q <sub>4</sub> |

For diabetes management the summary of diabetes self care activities (SDSCA) by Toobert and Glasgow (1994) was utilized to evaluate self care practices of type 2 diabetes patients. The SDSCA is a twelve item self report measure that assesses the frequency of completing various diabetic regimen requirements over the course of the past seven days. The instrument assesses four main areas of diabetes specific regimen including diet, exercise, glucose testing and diabetes medication taking.

For self efficacy the diabetes empowerment scale (DES, Anderson, Arnold, Funnel, Fitzgerald, Butter and Feste, 1995, Anderson, Fitzgerald Funnell and Marrero, 2000) was used to evaluate self efficacy beliefs in the context of an individual living with diabetes mellitus. The DES is a 28 item self report measure of diabetes related psychosocial self efficacy. The instrument consists of three subscales including Managing psychosocial aspects of diabetes (social), Assessing dissatisfaction and readiness to change (Dissatisfaction) and setting and achieving Goals (Goals).

## RESULTS AND DISCUSSION

Multiple regression analysis was computed for the SDSCA total, diet, exercise, glucose testing and medication with the help of SPSS 16 version. Model summary of regression analysis is presented in the Table.

**Table 1. Model summary of regression analysis**

|                            | predictors            | R    | R <sup>2</sup> | B     | t     | sig  |
|----------------------------|-----------------------|------|----------------|-------|-------|------|
| SDSCA total                | Factor C              | .383 | .147           | .831  | 2.68  | .009 |
|                            | Factor Q <sub>3</sub> | .467 | .071           | .904  | 2.65  | .010 |
| Diet                       | Factor Q <sub>3</sub> | .289 | .083           | .519  | 2.88  | .005 |
|                            | Factor O              | .387 | .067           | .376  | 2.39  | .019 |
| Exercise                   | Factor N              | .248 | .062           | -.399 | -2.49 | .015 |
|                            | Factor A              | .336 | .051           | -.485 | -2.98 | .004 |
| Glucose testing medication | Factor F              | .260 | .068           | .181  | 2.32  | .023 |
|                            | Factor C              | .326 | .106           | .435  | 2.93  | .005 |
|                            | Factor Q <sub>4</sub> | .441 | .088           | .481  | 3.00  | .004 |
|                            | Factor B              | .493 | .048           | .375  | 2.20  | .031 |

According to given table the model of regression analysis of SDSCA total is significant, as the R<sup>2</sup> obtained, is R<sup>2</sup>= .218, F

(1, 79) = 13.39,  $P < 0.01$ , which indicates the strength of model. It is observed that the overall factors taken together. Contribute 21.8% in variation of criterion variable i.e. SDSCA total taken in the study. Among the factor taken, factors C & Q<sub>3</sub> of personality emerge out to be significant predictor for the criterion variable taken. It is observed that factor C contribute 14.7% ( $R^2$  change .147, B coefficient .287,  $t = 2.68$  and  $< .01$ ) and Q<sub>3</sub> contribute 7.1% ( $R^2$  change 0.071, B Coefficient .284,  $t = 2.650$ ,  $< .01$ ) in the variation of criterion variable. The significant t value indicates significant contribution of the predictors. The positive relationship between personality factor C (ego strength) and Q<sub>3</sub> (Self discipline) indicate that higher the ego strength better will be over all self care by diabetes person. Higher score on factor C of 16 personality factor means that the person tend to be emotionally mature, stable, realistic about life, possessing ego strength, better able to maintain solid group morale. shrewd clinical observers have pointed out that a good C level sometimes enable a person to achieve effective adjustment despite an underlying psychotic potential and lower score on factor C means that the person tend to be low in frustration tolerance for unsatisfactory conditions, changeable, fatigued fretful easily annoyed and emotional, active in dissatisfaction. And higher the self discipline better will be over all self care activities higher score on factor Q<sub>3</sub> of 16 PF means that the person tend to be strong control of their emotions and general behavior, are inclined to be socially aware and careful and lower scores tend to not be bothered with will control and have little regard for social demands. They may feel maladjusted.

The model of regression analysis of diet is significant, as the  $R^2$  obtained, is  $R^2 = .150$ ,  $F = 6.720$  (1, 75),  $P < 0.01$ , which indicates the strength of model. It is observed that the overall factor taken together. Contribute 15.0% in variation of criterion variable i.e. diet taken in the study. Among the factor taken, factors O & Q<sub>3</sub> of personality emerge out to be significant predictor. It observed that factor Q<sub>3</sub> contribute 8.3% ( $R^2 = .083$ , B coefficient .313, B coefficient = .519,  $t = 2.88$ ,  $< .01$ ) and O contribute 6.7% ( $R^2 = .067$ , B Coefficient .260, B,  $t = 2.39$ ,  $< 0.01$ ) in the variation of criterion variable. The significant t value indicates significant contribution of the predictors. The positive relationship between personality Factors Q<sub>3</sub> (self discipline) and O (Insecurity) indicates that Higher the self discipline and insobriety better will be diet management. Higher score on factor Q<sub>3</sub> of 16 PF means that the person tend to be strong control of their emotions and general behavior, are inclined to be socially aware & careful. And lower score tend to be not bothered with will control and have little regard for social demands. Higher score on Factor O of 16 PF means that the person tend to be worry, feel anxious and guilt stricken over difficulties, strong sense of obligation. And lower score means person tend to be Unruffled and to have Unshakable nerve, feels free of Guilt.

The model of regression analysis of exercise is significant, as the  $R^2$  obtained is,  $R^2 = .113$ ,  $F = 4.862$  (1, 75),  $p < 0.01$ . Which indicates the strength of model it is observed that the overall factor taken together contribute 11.3% in variation of criterion variable i.e. exercise taken in the study. Among the factors taken factor N and A of personality emerge out to be significant predictor. it observed that factor N contribute 6.2%

( $R^2 = .062$ , B coefficient =  $-.399$ ,  $t = -2.49$ ,  $p < 0.01$ ) and factor A contribute 5.1% ( $R^2 = 0.051$ , B =  $-.485$ ,  $t = -2.98$ ,  $p < 0.01$ ) in the variation of criterion variable. The significant t value indicates significant contribution of the predictors. The positive relationship between personality factor N (shrewdness) and factor A (warmth) indicates Higher the shrewdness and warmth better will be indication towards exercise. Higher on Factor N of 16 PF means that the person tend to be polished, experienced and shrewd. And lower score indicates a lot of natural warmth and a genuine liking for people. Higher score on Factor A of 16 PF means that the person tend to be good natured, easy going emotionally expressive and lower score indicates stiff, cool, aloof, and skeptical.

The model of regression analysis of glucose testing is significant, as the  $R^2$  obtained is,  $R^2 = .068$ ,  $F = 5.386$  (1, 75),  $p < .01$ , which indicates the strength of model. It is observed that factor F contribute 6.8% ( $R^2 = .068$ , B = .181,  $t = 2.32$ ,  $< 0.01$ ) in the variation of criterion variable. The significant t value indicates significant contribution of the predictors. The positive relationship between personality factor F (impulsivity) indicates that Higher the impulsivity will be better managed glucose testing. Higher score on Factor F of 16 PF means that the person tends to be cheerful, active, and talkative, frank expressive. And lower score tend to be restrained, reticent and introspective, sober, dependable people.

The model of regression analysis of medication is significant, as the  $R^2$  obtained is,  $R^2 = .242$ ,  $F = 9.28$  (1, 79),  $p < 0.01$  which indicates the strength of model. It is observed that the overall factor taken together contribute 24.2% is variation of criterion variable i.e. medication taken in the study. it observed that factor C contribute 10.6% ( $R^2 = .106$ , B = .435,  $t = 2.93$   $p < 0.01$ ), factor B contribute 4.8% ( $R^2 = 0.048$ , B = .375,  $t = 2.20$ ,  $p < 0.1$ ) and factor Q<sub>4</sub> contribute 8.8% ( $R^2 = 0.088$ , B = .481,  $t = 3.00$   $p < 0.01$ ), in the variation of criterion variable. The positive relationship between personality factor C (ego strength), Q<sub>4</sub> (tension), B (intelligent) indicates that Higher level of ego strength, tension and intelligence will be better manage of medication.

Higher score on factor C of 16 PF indicates person tend to be emotionally stable, stable, possessing ego strength and lower score tend to be low in frustration tolerance for Unsatisfactory conditions, fatigued. Higher score on factor Q<sub>4</sub> of 16 PF means that person tend to be tense, restless, fretful, impatient and lower score means tend to be relaxed, composed and satisfied. Higher score on factor B of 16 PF indicates that person tend to be Quick to grasp ideas, a fast learner, and lower score means slow to learn, and grasp, dull and given to concrete and literal interpretation.

Self efficacy and gender have not played any significant role in diabetes management.

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