The focus of the present investigation was on studying health locus of control, resilience and perceived social support as determinants of health status among diabetics. The data was analyzed using appropriate statistical analysis.

The independent t-test was used to examine the difference between the mean scores of several demographic variables on health locus of control, resilience, perceived social support and health status of diabetic patients. Step wise multiple regression analysis was carried out to see the effect of health locus of control, resilience and perceived social support on health status. Resilience turned out to be the strongest predictor for all the dimensions of health status among diabetics as a whole as well as among controlled and uncontrolled groups of diabetic patients.

In table 4.1 significant difference was found between educated and uneducated diabetic patients on internal health locus of control and chance health locus of control. In table 4.2 significant difference was found between educated and uneducated diabetic patients on resilience. Significant difference was also found on the friend support dimension of perceived social support in table 4.3. In table 4.4 significant difference was found on all the dimensions of health status between educated and uneducated diabetic patients except on role-physical.

Educated diabetic patients scored higher than uneducated diabetic patients on internal health locus of control. In a study done by Morowatisharifabad et al. (2010) they also found that internal locus of control is increased as educational level rises and chance locus of control decreases as educational level rises. Morowatisharifabad et al. (2010) highlighted that chance locus of control decreases as education level rises and in this study we also found that on chance health locus of control uneducated diabetic patients scored higher than educated diabetic patients.
In this study educated diabetic patients scored significantly higher than uneducated diabetic patients on resilience, according to Cambell-Sills, Forde and Stein (2009) females, individuals with lower levels of education and income, and individuals with histories of childhood maltreatment reported diminished resilience overall.

On perceived social support significant difference was found on friends’ support with educated diabetic patients scoring higher than uneducated, the possible explanation could be that education makes a person broad minded, enhances personality and grooms the person, education makes a person thoughtful. An educated person can better understand the needs of others and can develop a good rapport with others; this could be the reason that educated diabetic patients scored higher than uneducated diabetic patients on friends support dimension of perceived social support.

Significant difference was found on all the dimensions of health status except role physical with regard to educated and uneducated diabetic patients. In other words educated diabetic patients know more about the disease, they are more aware about how to cope with the disease and negative effects of high blood sugar levels. Educated diabetic patients are more responsive to the doctor’s advice and they follow the treatment and advice regularly as compared to uneducated diabetic patients, thus educated diabetic patients have better health status than uneducated diabetic patients. According to Kalichman et al. (2000), Johnston, Diab, Kim, & Kirschblum, (2005), Benson & Forman, (2002) and Meadows, (2000) the ability to read and understand health information has been identified as a critical factor in maintaining independent activities of daily living. Mielck et al. (2012) reported that low status groups are faced with a double burden, first by increased levels of health impairments, and second by lower levels of health related quality of life once health is impaired. On the other hand, Hahn et al., (2007) found that in cancer patients there appears to be no systematic
literacy bias in reporting health related quality of life, and low literacy is not an independent risk factor for poorer health related quality of life. In another study Jahanlou and Karami (2011) reported that literacy level does not have any effects on glycemic control, they found that literacy level among the three groups from the viewpoint of age, physical domain, psychological domain and environmental domain and self-efficacy were significant.

Tables 4.5 to 4.8 shows the difference between the mean scores of insulin dependent and tablet takers on health locus of control, resilience, perceived social support and health status. In table 4.5 no significant difference was found on any dimension of health locus of control. In table 4.5 tablet taker diabetic patients scored higher on resilience than insulin dependent diabetic patients, the possible explanation could be that individuals having higher resilience are better able to manage their diabetes and so, they do not require insulin injections rather they only depend on tablets for managing their diabetes. In table 4.7 no significant difference was found on any dimension of perceived social support with regard to mode of treatment.

From table 4.8 it is clear that significant difference was found on four dimensions of health locus of control i.e. physical functioning, role-physical, general health and mental health. Among these four physical functioning, role–physical and general health constitutes the physical component of the health status and in these three dimensions tablet takers have a high mean score as compared to insulin dependent, in other words it can be said that tablet takers have better health status as compared to insulin dependent diabetics on these four dimensions. According to Hart et al. (2007) Patient’s self care, consisting of daily insulin injections and self monitoring of blood glucose, has an impact on health related quality of life in type 1 diabetic patients. On
the other hand Valenzuela et al. (2006) found that in diabetic children insulin pump therapy does not have negative implications for health related quality of life.

Tables 4.9 to table 4.12 shows difference between the mean scores of diabetic patients with complications of diabetes and without complications of diabetes on health locus of control, resilience, perceived social support and health status.

In table 4.9 significant difference was found on internal health locus of control, dimension of health locus of control with patients without complications scoring higher than patients with complications.

According to Aalto, Uutela and Aro (1999) greater distress was related to multiple diabetic complications, lower availability and adequacy of general social support, more criticizing diabetes-related support, lower internal diabetes locus of control, higher chance, significant others and professionals diabetes locus of control, lower perceived net benefits of regimen adherence, higher perceived threat of complications and poorer perceived health. Stenstrom et al. (1998) found that diabetic patients with strong beliefs that their own behaviour is responsible for the course of the disease and weak beliefs in chance and luck were metabolically better regulated than participants who exhibited other health locus of control patterns. This implies that participants high on internal health locus of control better manage their diabetes and thus, they have less or no complications of diabetes.

In table 4.10 diabetic patients without complications scored higher on resilience i.e. they are more resilient than diabetic patients with complications of diabetes, in other words diabetic patients who are high on resilience are able to bounce back from their condition to manage their diabetes as a result they have better metabolic control and thus, they do not have any complication of diabetes.
In table 4.11 significant difference was found on significant others’ dimension of perceived social support with patients without diabetic complications scoring higher than patients with complications of diabetes. Westaway et al. (2007) found that in diabetes patients with lower levels of social support had poorer general health and well-being than patients with higher levels of social support. In other words support from significant others helps in better management of diabetes thus, helps in controlling the diabetes related complications. Significant others in patient’s life help him or her to better manage the disease, the support from special people help to cope well with disease both emotionally as well as physically which in turn leads to better management of diabetes and thus, less or no complications.

In table 4.12 significant difference was found on all the dimensions of health status in terms of mean difference between patients with complications and patients without complications. Yekta, Pourali and Ghasemi-rad (2011) found that living alone, a low educational level, and having at least one complication were all associated with lower health related quality of life score in patients with diabetic foot ulcers. According to Goodridge et al. (2005) health related quality of life is worse among individuals with diabetes than individuals without diabetes and complications of diabetes, including foot ulcers have a major negative effect on health related quality of life.

Tables from 4.13 to 4.16 showed difference between the mean scores of male and female diabetic patients on health locus of control, resilience, perceived social support and health status.

In table 4.13 male diabetics scored higher on internal health locus of control than females and female diabetic patients scored higher on chance health locus of control than male diabetic patients. Morowatisharifabad et al. (2010) also found that
male diabetics demonstrated more internal locus of control, whereas females displayed
evidence of chance locus of control. But Aalto and Uutela (1997) did not find any
difference in locus of control by gender. In this study most of the diabetic women were
housewives and in cultures like India, women tend to have more familial orientation
and so they rely more on their husbands and family members that could be the reason
women were more externally oriented. Table 4.14 showed that male diabetic patients
were found to be more resilient than females. According to Boardman, Blalock, &
Button (2008) increased attention to the genetics of resilience has revealed the
heritability of resilience to be higher in men versus women.

In table 4.15 no difference was found with regard to gender on dimensions of
perceived social support. Eriksson and Rosenqvist (1993) also found no difference
between male and females with regard to perceived social support. In table 4.16 male
diabetic patients scored significantly higher than female diabetic patients on health
status. According to Al-Shehri,Taha,Bahnassy and Salah (2008) health related quality
of life was lower in type 2 diabetic patients than controls and was affected by many
factors, they highlighted that females had lower health related quality of life than
males, possibly because of a higher incidence of obesity. Uncontrolled diabetic patients
had a lower health related quality of life than controlled diabetics. Improving health
related quality of life in diabetic patients is important.

Step-wise multiple regressions showed that resilience turned out to be the
strongest predictor of the dimensions of health status among overall diabetic patients
and in the controlled as well as uncontrolled group of diabetic patients.

In the overall group resilience turned out to be the strongest predictor of all the
eight dimensions of health status. Wells et al. (2010) found that high resilience levels
were associated with good mental and physical health status. They found that better perceived physical health status was associated with resilience, and this is well supported in the literature (Adams, Sanders, & Auth, 2004; Felten, 2000; Hardy, Concato, & Gill, 2004; Hinck, 2004; Montross et al., 2006; Wagnild, 2003). According to, Wagnild (2003) and Hardy, Concato, and Gill (2002) resilience scores have been demonstrated to be positively correlated with mental health and physical functioning of the elderly.

According to Bradshaw, Richardson and Kulkarni (2007) research in a diabetes population suggests that resiliency training in addition to standard diabetes education in people with type 2 diabetes improved coping with diabetes-related stress, having fun in life, helping others, and feeling trustworthy. Psychosocial and physiological improvements can help people with diabetes thrive instead of succumb to despair. Interventions to foster resilience among people with type 2 diabetes have the potential to make an important contribution to reducing the risk of complications and increasing positive life outcomes. Ong et al. (2006) found that resilient individuals were more likely to have positive emotions, which helped to develop resistance and recovery from stress and thus may contribute to better health and longevity. Resilience is found to be an important attribute in recovery from illness and other stressful events (Hardy, Concato, and Gill 2002; Lamond et al. 2009).

Internal health locus of control turned out to be the second most important predictor of physical functioning, bodily pain, general health and third most important predictor of mental health. Increases in internal health locus of control have been associated with improvements in strength and physical functioning among individuals with motor neuron disease (Hogg, Goldstein, & Leigh, 1994). Internal health locus of control is related to better physical and mental well-being (Pucheu, Consoli, D’Auzac,
Français, & Issad, 2004) and more proactive health behaviors (Bonetti et al., 2001). High internal health locus of control has also been found to extend length of survival among patients with lung disease who underwent lung transplantation (Burker, Evon, Galanko, & Egan, 2005). According to Perrin and Shapiro (1985) children with asthma who perceive their ability to control their health more positively adhere to their recommended regimen. According to Sørensen et al. (2007) among the diabetic patients, those who believed more on their own ability to control their diabetes and less on chance reported better mental health and were less likely to be on dialysis.

Friends’ support emerged as the third most important predictor of physical functioning among diabetics but it was related negatively to physical functioning. Researchers working with adolescents facing diabetes found that family members gave more instrumental support than friends for such activities as insulin injections, nutrition and glucose monitoring. Conversely friends supplied more emotional support in coping with the disease. (La Greca, Auslander, Greco, & Spetter, 1995). The negative relationship between physical functioning and friends’ support can be explained as in today’s competitive world friend are more seen as a competitor and due to the busy schedules people have superficial friendships rather than meaningful relations with friends.

In table 4.18 again resilience turned out to be the most important predictor of role-physical, the second most important predictor was powerful others health locus of control. According to Wallston and Wallston(1982) powerful others health locus of control is related to stronger adherence to medical recommendations but higher likelihood of chronic pain or disability. The third most important predictor was chance health locus of control. Snyder (2006) found that chance health locus of control helped to explain patient responses to health issues. Snyder (2006) provided evidence that in
both the general population and persons with venous ulcers, less compliance was observed in persons with chance orientation. Based on his findings, Snyder (2006) concluded that people who scored high on chance health locus of control may believe that health is the outcome of chance or luck; therefore following doctor’s prescription and instructions may not help, so they do not comply with medication regimens and thus, have low health status.

In table 4.19 resilience turned out to be the strongest predictor of bodily pain followed by internal health locus of control. Friborg et al. (2006) studied the predictive validity of the Resilience Scale for Adults (RSA) experimentally in relation to pain and stress. The researchers found that individuals scoring high on the resilience scale for adults reported less pain and stress. Greendale, Hirsch and Hahn (1993) assessed the effect of an exercise intervention using a weighted vest on perceived health status and bone density in older persons, the researchers found that subjects in the vest group reported a statistically significant decrease in bodily pain, improved physical functioning and increased internal health locus of control. According to Haythronthwaite et al. (1998) and Toomey et al (1991) individuals with an internal locus of control who experience chronic pain are likely to believe that their own efforts will affect their pain and are therefore more likely to adapt active coping strategies. On the other hand, Hurwitz et al. (2006) found no consistent relations of internal health locus of control, and physical and psychological job demands with improvements in pain and disability were detected.

In table 4.20, resilience again turned out to be the strongest predictor of general health which was followed by internal health locus of control. Bradshaw et al. (2007) highlighted that in their study, intervention group had higher levels of resiliency as reported by knowing positive ways of coping with diabetes-related stress, knowing
enough about themselves to make right diabetes choices, having fun in life, eating healthier, and increasing physical activity compared with the control group, they concluded that interventions to foster resilience among people with diabetes have the potential to make an important contribution to increasing positive life outcomes. Previous research has shown that high levels of resilience resources buffer, or protect, diabetes patients from worsening HbA1c or self-care behaviors in the face of rising distress (Yi et al., 2008). Internal health locus of control turned out to be the second strongest predictor of general health among diabetic patients. There are researches which failed to show a relationship between internal health locus of control and health promoting behaviours (Gierszewski, 1983; Oberle, 1991; Oldridge & Streiner, 1990). But on the other hand, Macrodimitris et al. (2001) studied the relationship between perceived control and HbA1C levels in 115 type 2 diabetic patients. Results showed that perceived control was negatively related to HbA1C levels. High perceived control has a positive effect on individuals with type 2 diabetes as shown by lower HbA1C levels. Tillotson and Smith (1996) conducted a study to examine how psychosocial factors influence regimen adherence behaviour. The aim of the study was to assess the ability of internal diabetes control and social support to predict adherence to a weight control regimen among persons with non insulin dependent diabetes in a sample of 465 patients. The results showed that internal locus of control and social support were significant predictors of regimen adherence. Gillibrand and Stevenson (2006) they found that high internal locus of control beliefs and high levels of self-efficacy predicted the benefits of adhering to the self-care regime which in turn helps in better management of diabetes and health in general.

Table 4.21 showed that resilience again turned out to be the strongest predictor of vitality followed by chance health locus of control. Burns, Anstey and Windsor
structured equation models identified the psychological wellbeing variables as significantly related to subjective well-being, which fully mediated the effects of resilience and partially mediated the effect of mastery (resilience) on depression and anxiety. Lai (1995) found that there was a moderating effect of resilience on the relationship between hassles and subjective well-being. Individuals reporting beliefs that health status is caused by external forces such as chance and fate (CHLC) are more likely to report feelings of helplessness and psychological distress (Crisson & Keefe, 1988), depression, and anxiety (Bonetti et al., 2001).

Table 4.22 showed that resilience predicted social functioning followed by family support and friends’ support. The relationship of social functioning with resilience and family support was positive whereas the relationship between friends’ support and social functioning was negative. Mertens (2011) highlighted that high level of mastery (resilience) is significantly associated with physical, mental and social functioning in the total study population of diabetics and chronic obstructive pulmonary disease, as well as in subgroups of patients with chronic obstructive pulmonary disease or diabetes. According to Mengel et al. (1990) in diabetic patients, regardless of therapy, higher levels of social support correlated with higher levels of psychological and social functioning at the initial measurement time, and with improvements in quality of family life over the 6 month measurement time. Friendship roles are not interchangeable with close relations. For example, according to Arling (1976) and Wenger (1990) contact with one’s children may have different effect as contact with friends. Studies have found that interaction with friends and with family can have different and distinctive patterns in reliability of support (Seeman & Berkman, 1988), satisfaction with support (Rook, 1987), morale (Crohan & Antonucci, 1989), arousal and affect (Felton & Berry, 1992; Larson, Mannell, & Zuzanek, 1986), depression
(Potts, 1997), and psychological distress (Dean, Kolody, & Wood, 1990; Matt & Dean, 1993). According to Cantor (1979) found that family, both partners and children, were the first choice of the elderly when requesting tangible aid. Some studies have found that family relationships, frequently measured as relationships with children, are most important in the physical well-being of the elderly. Elders who are ill experience a greater benefit from family support than friend support in the areas of life satisfaction, emotional well-being (Friedman, 1993) and adjustment (Primomo, Yates, & Woods, 1990). Researchers working with adolescents who have diabetes, have found that family members gave more instrumental support than friends for activities like insulin injections, nutrition, and glucose monitoring. Conversely, friends supplied more emotional support in coping with the disease (LaGreca, Auslander, Greco, & Spetter, 1995).

In table 4.23, resilience turned out to be the first predictor for role-emotional, and the second predictor was chance health locus of control. The direction of influence of resilience on role-emotional was positive while the direction of influence of chance health locus of control with role-emotional was negative. McDonald-Miszczak, Maki, and Gould, (2000) also found a negative relationship between chance health locus of control, health value, and medication misuse. According to these researchers, people who scored high on Chance health locus of control generally believed that health was related to chance or luck; therefore following prescription instructions would not help, so they did not comply with medication regimens and in other words we can say that people who believe in chance health locus of control tend to feel everything out of their own control, so at work also they are not been able to control things on their own and they feel helpless as they attribute everything to luck and chance and thus, it affects
their mental health which manifest itself at work such as they have poor concentration, lack of involvement in work etc.

In table 4.24 resilience again turned out to be the most important predictor of mental health followed by chance health locus of control and internal health locus of control. The direction of influence of resilience and internal health locus of control being positive and chance health locus of control being negative. Wells et al (2010) found that high resilience levels were associated with good mental and physical health status. Yi et al (2008) found in their study that with diabetic patients with low or moderate resilience levels showed a strong association between rising distress and worsening $\text{HbA}_{1c}$ across time, however, those with high resilience scores did not show the same associations, low resilience was also associated with fewer self-care behaviours when faced with increasing distress. Sørensen et al (2007) among the diabetic patients, those who believed more on their own ability to control their diabetes and less on chance reported better mental health and were less likely to be on dialysis.

As mentioned before as well highlighted that individuals reporting beliefs that health status is caused by external forces such as chance and fate are more likely to report feelings of helplessness and psychological distress (Crisson & Keefe, (1988) depression, and anxiety (Bonetti et al., 2001)

Tables 4.25 to 4.32 showed the step-wise multiple regression analysis for controlled group of diabetic patients. In the physical health scales of health status resilience turned out to be the major predictor followed by internal health locus of control. As previously discussed Wells et al. (2010) found that high resilience levels were associated with good mental and physical health status. They found that better perceived physical health status was associated with resilience, and this is well supported in the literature (Adams, Sanders, & Auth, 2004; Felten, 2000; Hardy,
Concato, & Gill, 2004; Hinck, 2004; Montross et al., 2006; Wagnild, 2003). Internal health locus of control turned out to be the second most important predictor of the physical scales of the health status. In the study conducted by, Pucheu and colleagues (2004) they evaluated the relationship between health locus of control and quality of life (QOL) in 47 peritoneal dialysis patients, and found the physical component scale of their quality of life measure was positively correlated with internal health locus of control and negatively correlated with powerful others health locus of control.

Again in the mental health dimensions of health status resilience turned out to be the most important predictor of all the four scales. Previous research has shown that high levels of resilience resources buffer, or protect, diabetes patients from worsening \( \text{HbA}_1c \) or self-care behaviors in the face of rising distress (Yi et al., 2008), in other words high levels of resilience helps to buffer the negative effects of diabetes on mental health of the patients. In table 4.29 internal health locus of control came out to be the second most important predictor of vitality. As people who are internally oriented are more action oriented and they believe that they are responsible for the outcome of their health, so they take every measure to remain physically and mentally fit and thus, they have high energy levels.

In table 4.30 family supports came out to be the second important predictor of social functioning after resilience. As previously discussed, Studies have found that interaction with friends and with family can produce different and distinctive patterns in reliability of support (Seeman & Berkman, 1988), satisfaction with support (Rook, 1987), morale (Crohan & Antonucci, 1989), arousal and affect (Felton & Berry, 1992; Larson, Mannell, & Zuzanek, 1986), depression (Potts, 1997), and psychological distress (Dean, Kolody, & Wood, 1990; Matt & Dean, 1993). For example, Cantor (1979) found that family, both partners and children, were the first choice of the elderly. 
when requesting tangible aid. Some studies have found that family relationships, frequently measured as relationships with children, are most important in the physical well-being of the elderly. Elders who are ill experience a greater benefit from family support than friend support in the areas of life satisfaction, emotional well-being (Friedman, 1993) and adjustment (Primomo, Yates, & Woods, 1990).

Table 4.33 to Table 4.40 showed the step-wise multiple regression analysis for the different dimensions of health status for the uncontrolled group of diabetic patients. Resilience once again turned out to be the most important predictor for all the dimensions of health status in the uncontrolled group of diabetic patients as well. In the tables 4.33, 4.34 and 4.36 friends’ support was the second predictor of physical functioning, role-physical and general health respectively in the uncontrolled group of diabetic patients, friends’ support have a negative relationship with physical functioning, role-physical, and general health. Thompson and Heller (1990) found that having lower frequency of interaction levels of social support from Friends or from family was associated with lower levels of functional health as measured by Activities of Daily Living (ADL) scores. These findings showed that lower levels of qualitative family support were related to lower psychological health, while lower levels on frequency of interaction support from either friends or family were related to lower functional health. As previously discussed friendship roles are not interchangeable with close relations as according to Arling (1976) and Wenger (1990) contact with one's children may have different effect as contact with friends. In other words we can say that with friends patients are having only superficial relations not meaningful relations so, despite of proving benefit, support from friend is having a negative effect on diabetic patients’ health status. In table 4.35, resilience and chance health locus of
control turned out to be the most important predictors for bodily pain, chance health locus of control have a negative relationship with bodily pain.

Crisson and Keefe (1988) studied 62 chronic pain patients and found that patients who viewed outcomes as controlled by chance factors such as fate or luck tended to rely on maladaptive pain coping strategies and rated their abilities to control and decrease pain as poor. In table 4.37 resilience once again with chance health locus of control predicted vitality, chance health locus of control have negative influence on vitality. Patients with uncontrolled diabetes who have chance health locus of control tend to have low energy levels and more fatigue, it can be explained as patients feel that nothing is under their control not even managing their diabetes so, as a result of high blood sugar levels they may feel lethargic and have low energy levels and high fatigue.

In table 4.38 resilience and chance health locus of control turned out to be the most important predictors of social functioning with chance health locus of control having a negative relationship with social functioning among uncontrolled group of diabetic patients, the reason could be that patients who have chance orientation and believe that nothing is under their control not even managing their disease, and thus, have high blood sugar levels which in turn causes fatigue and low energy levels, and effects social functioning of the patients. In table 4.39 resilience, chance health locus of control, support from significant others and family support all turned out to be the significant predictors of role-emotional respectively. According to Crisson and Keefe (1988) patients having a chance orientation toward locus of control were more likely to report depression, anxiety, and obsessive-compulsive symptoms and to have higher overall levels of psychological distress. Support from significant others helps in managing the emotions more effectively, most of the diabetic patients reported that they have a significant person in their lives who take care of them, thus getting
emotional support from a significant other help patients to cope effectively with their emotions. In uncontrolled diabetic patients family support negatively influences the role-emotional dimension of the patients. The possible explanation could be that family members do not provide enough support in the uncontrolled group and this could also be one of the reasons of elevated blood sugar levels, patients were not able to get enough emotional help from the family as most of the patients in this group reported that they were not satisfied with their family relations.

In table 4.40, resilience again along with chance health locus of control predicted mental health. The explanation for the effect of resilience on mental has been already discussed. According to Crisson and Keefe (1988), individuals having chance orientation report feelings of helplessness and psychological distress and according to Bonetti et al. (2001) people who are externally oriented suffer from depression and anxiety.