



Discussion



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The number of older adults with cancer is on the rise and these older adults have significant caregiving needs. In fact, 63% of home care of older adults with cancer is provided by informal caregivers (**Jayani & Hurria, 2012**). Cancer caregiving is generally viewed as one of the most stress-inducing caregiving challenges faced by family members and the diagnosis of cancer often leads to physical, mental, and social challenges for both patients and their families, especially the older populations (**Kim & Given, 2008**). Public support for older adults is limited in Egypt, and families are the main, if not only, the source of old-age support. This gap in care exists because policy makers still assume that families will care for their older relatives, despite increasing rates of migration, urbanization, and women's participation in the workforce (**Sinunu et al., 2009**).

Moreover, the shift in the provision of health care services from institutional to community based settings is translating into an increased requirement for individuals to care for family members in the home. Despite the rapidly growing demands for home services, short term respite programs are extremely limited in rural Egypt. Family members, therefore, take upon themselves the considerable responsibilities, stress associated with providing adequate care and supervision for their older relatives (**Salama & Abou El-Soud, 2012**). For this, it is important to explore caregiver's emotional distress as it helps in exploring their burden which can have impact on the patient's illness and functioning apart from their own (**Balhara et al., 2012**).

Therefore, the aim of this study was to identify caregiving burden and psychological health status of caregivers caring for older adults with cancer and assess relationship caregiving burden and psychological health status of caregivers.

There are many common diseases that are more common in males or females. In cancer, susceptibility is generally higher in males although some cancers are more common in women and the lifetime probability of developing cancer is 44.85% for males, and 38.08% for females (**Dorak & Karpuzoglu, 2012**). Conversely, the results of the present study revealed that more than two third of the studied patients were female. This result may be attributed to the availability of the study subjects at the time

of data collection. This result in contrast with the study of **Hsu et al (2014)** in which more than half of cancer elderly were male.

Rural areas report a higher prevalence of chronic diseases including cancer, in part, to a population that is older, poorer, and less educated (**Gosschalk & Carozza, 2003**). Supporting this, the present study showed that the majority of the studied older adults' patients were illiterate, from rural areas and had not enough income. This may be due to people with low-income, education and living in rural areas are less able to afford healthy food (diet rich in fat and cholesterol), spend time participating in physical activity, tend to have more stress and do not have access to high quality cancer prevention, early detection, and treatment services in which there is limited access to health care. Moreover, a lack of knowledge about the risk factors of cancer, as well as the understanding of symptoms and when to go to the doctor, greatly affects both the development of disease as well as the prognosis of it.

Hypertension is a common health problem in Egypt. More than 50% of individuals older than 60 years suffered from hypertension (**Ibrahim, 2013**). The results of the present study showed that the most common comorbid disease in older adults was hypertension followed by diabetes mellitus. This finding may be explained by the fact that chronic diseases and co-morbidities increase with advancing age. This result in line with the study of **Yong et al (2012)** in China and **Chindaprasirt et al (2014)** in Thailand which revealed that hypertension was the most common co morbid disease with cancer.

Breast cancer was the most prevalent type of cancer in this study. This result may be due to the majority of the studied older adults were females and breast cancer is considered the most common cancer in female in Egypt (**El-Shinawi et al., 2013**). This result in line with the study of **Papastavrou et al (2009)**.

Chemotherapy is a cornerstone of cancer treatment for many tumor entities. Age is considered a risk factor for increased toxicity and poor tolerance to chemotherapy in which age-associated changes such as impairment of functional status and increased co morbidity which have an independent association with increased toxicity (**Wedding et al., 2007**). Despite this, chemotherapy was the most frequent used treatment of cancer among older adults in this study. This result may be attributed to the majority of the

older adults were independent and more than half of them did not have co morbid diseases and also may be returned to physician's decision for the type of treatment based on type of cancer and its stage . The same result was reported by the study of **Hsu et al (2014)** which revealed that about two third of older adults with receive chemotherapy.

Disability increases steeply with age. It has been estimated that 48% of all newly diagnosed older cancer patients have performance limitations as measured by activities of daily living (ADL) and instrumental activities of daily living (IADL) (**Prouse & Phillips, 2013**). The result of the present study showed that the majority of the older adults were independent in ADL and about two third of them need assistant in IADL. This result may be attributed to the majority of the older adults were young old.

The mean age of caregivers in the present study was 40.14 ± 11.14 (range 18-65 years). In **Evcı et al (2012)** study, the mean age of the caregivers was 39.45 ± 10.65 (range, 16-63 years). In the study of **Papastavrou et al (2009)**, the caregivers were with a mean age of 50.65 ± 13.4 (range 25 to 78 years). In **Yang et al (2012)** study, the caregivers' average age was 44.3 ± 11.5 years old, ranging from 20–79 years old. This finding points toward the fact that middle age groups are assigned the role of caregivers more often.

According to the results of some studies, approximately 60-77% of caregivers were female, while this rate was 71.3% in this study (**Pinquart and Sörensen, 2007; Carod-Artal et al., 2009; Bergström et al., 2011 and Christofolletti et al., 2011**). This result may be attributed to woman in developing countries, like Egypt, undertake the task of providing care. This gender distribution represents a similar gender ratio seen in Western families where 75%-80% of care provision is assumed by women (**Rashmi et al, 2007**).

Regarding marital status, the majority of the caregivers were married. This result may be due to the all of the studied caregivers were 18 years and old and the age of marriage in Egypt started from 18 years. This result in line with a study done in Canada by **Lai (2012)** and in Thailand by **Chindaprasirt et al (2014)** in which the majority of the caregivers were married.

Assessing the medical history of the caregivers and medication used, the majority of them did not suffer from any disease. This result may attributed to young

age of the caregivers selected in the study as the majority of them aged less than 45 years which decrease the possibility of the presence of diseases. The results also show that hypertension was the most common disease in caregivers who suffer from illness followed by diabetes mellitus. The same finding reported by **Chindaprasirt et al (2014)** in which the majority of caregivers were healthy and hypertension was the most common disease followed by diabetes mellitus. Moreover, the study done by **Park et al (2013)** also revealed that the majority of the caregivers were healthy.

Sons and daughters were the most common caregivers rankings in this study. This result may be due to the presence of aged wife with chronic illness who can't provide care for the spouse and by tradition, the other family members especially daughters and daughters-in-law take responsibility for caring for older adults. Also in Egypt, it is an obligation to provide care for the elderly, owing to the thought of filial piety. The same finding was reported by another study carried out by **Evcı et al (2012)**. In a study from China, **Ken et al (2010)** reported that “sons/daughters” are the most suitable caregivers. On the other hand, caregivers were predominately female spouses in the study of **Harkness & Tranmer (2007)** and **Papastavrou et al (2009)**.

The majority of the studied caregivers were live with older adult in the same house in this study. This result may due to the culture in Egypt in which family members usually live in the same place. This result in line with the study done by **Hsu et al (2014)** in California which revealed that the majority of the caregivers live with elderly with cancer. As regards to interview place, more than two third of the study samples were interviewed in the outpatient clinics and about one third were interviewed in the inpatient wards. This result may be attributed to the limited number of older adults with caregivers in the inpatient wards. This result is consistent with a study done in Korea by **Park et al (2013)** in which care setting was 75% outpatient and 25% inpatient.

Caring for older adults with cancer may involve additional challenges, which may put family caregivers at particularly high risk of burden. In the present study, the mean burden scores were 51.23±12.65 and more than half of the studied caregivers had moderate burden. This result may be justified by despite of caregiving being a satisfying experience some times in our culture it is still emotionally draining, physically

demanding and distracting the caregiver from taking care of self. Also, in Egypt there are limited social services and respite centers along with poor health delivery system.

The reported mean burden score of caregivers for this study was higher in comparison to those stated in literature. In Cyprus, **Papastavrou et al (2009)** study reported that the mean burden scores were 37.1 ± 15.9 . In China, **Young et al (2012)** study reported that the mean burden scale was 27.3, SD 15.0. In Turkey, the study done by **Turkoglu et al (2012)** reported that the mean score of burden of caregivers was 36.65 ± 11.21 and 15% of the caregivers reported high levels of burden. In Thailand, a study done by **Chindaprasirt et al (2014)** where mean burden scores were 19.15 ± 12.85 and the majority of the studied caregivers reported no burden. In California, the study done by **Hsu et al (2014)** who reported that 15% of family caregivers reporting high levels of burden. These differences can partly be explained by sampling variations regarding the stage of illness, the lack of availability of support care services and social networks or cultural differences which may aggravate such differences. In Egyptian society, family caregivers play a main role in the treatment of older adults' patients with cancer because of the cultural expectation and obligations.

Cancer has a profound impact not only on the patient but on his or her caregiver as well. Caregivers of cancer patient experience significant level of psychological distress (**Berger et al., 2007**). The striking finding of this study is among majority of caregivers on general health questionnaire. Mean and standard deviation was 23.01 ± 5.06 on general health questionnaire and the majority of caregivers had severe psychological distress. This result is consistent with a study done in Pakistan by **Yousafzai et al (2008)** study on caregivers of cancer patient which showed that 17% of caregivers with mild, 33% with moderate and 48% with severe psychological stress. Such high prevalence of stress could be secondary to anticipatory grief, being overburden and to undertake difficult and unfamiliar task at home. Apart from this the caregiver responsibility also includes over all coordination of care. On the other hand, a study done in Australia by **Hudson et al (2014)** on family caregivers of home based palliative care patients reported that the mean of general health questionnaire score was 14.8 (SD 5.6).

Anxiety and depression are the most common problems experienced by family caregivers, and anxiety and depression may be more common and severe in family

caregivers than in patients with cancer (**Stenberg et al, 2010**). The current study revealed that the mean score of anxiety were 11.31 ± 3.37 in which the majority of caregivers had anxiety and the mean score of depression were 10.64 ± 3.22 in which the majority of caregivers had depression. High level of anxiety and depression could be related to concerns about the future, coping with the situation, fear of loss and being alone, sole responsibility, or unfamiliar tasks at home. These situational factors may be seen as stressors influencing the caring situation, as indicated by **Haley et al (2003)**.

In a study done in Korea by **Park et al (2013)** the prevalence of anxiety was 38.1 %: (20.3 %) reported mild anxiety, (13.3 %) reported moderate anxiety, and (4.6 %) severe anxiety. The prevalence of depression was 82.2 %; of those with depression, (40.4 %) reported mild, (25.5 %) reported moderate, and (16.3 %) reported severe depression. In a study done in Italy by **Cormio et al (2014)** the caregivers' mean and standard deviation for anxiety was 9.17 ± 5.074 and depression was 7.48 ± 4.288 . In India, a study done by **Manjeet et al (2014)** reported that the mean anxiety & depression score of subjects were 8.28 (SD-3.45) & 8.79 (SD-3.94) respectively. These findings indicate that Egyptian caregivers are more emotionally sensitive to the perceived caregiving impact. They usually tend to hide their inner selves and so contribute to the detriment of their emotional health.

The results of the present study showed that caregiver burden increased with increasing older adults' age. This result may be due to the decline in physical functioning occurs with increasing age, and older adults become more dependent on others to meet their needs therefore, increased caregiver burden is expected. Despite this, there was not statistical significant relation between patient age and caregiver burden. This result may be explained by the mean age of the patients in which the majority was young old and the possibility of the age physical decline is low. This result is consistent with other studies (**Braun, 2007, Garlo, 2010 and Loureiro et al., 2013**). On contrast, a study done by **Dumont (2006)** and by **Papastavrou et al (2009)** found that patient age is a predictor of caregiver burden.

Also anxiety level and psychological distress increase with increasing older adults' age. This result may be due to increasing burden from caregiving or worry about the patient's death or deterioration in his health which increase with older age. The present study found that there were no statistical significant relations between older

adults' age and mean score of anxiety, depression and general psychological health. This may be due to the same reason that the majority of the studied patients were young old. The same result was reported by **Price et al (2010)** in Australia in which patient age was not significant to anxiety and depression levels in caregivers. On the other hand, this result contraindicate the result of the study done by **Mahadevan et al (2013)** in Malaysia who reported that the age of the patient is a factor that was significantly associated with emotional stress among the caregivers.

Regarding sex and marital status, the present study found that caregiver burden was higher in male and divorced older adult than female and married and the difference was not statistically significant. This may be due to men generally had more difficulty accepting the condition of dependency and the need to have someone taking care of them, contributing to the overload among family caregivers. Moreover, men worry less about maintaining their health, which makes them more susceptible to the occurrence of chronic conditions that can evolve functional impairment. The same results reported by **Garlo et al (2010)** who found that patient characteristics (gender, marital status) examined were not associated with caregiver burden. Furthermore, neither sex nor marital status was statistically significant to the mean score of anxiety, depression and general health questionnaire. The same result was reported by the study of **Oechsle et al (2013)** in Germany which revealed that caregivers' anxiety and depression were not associated with patient characteristics such gender ($p > 0.420$) and the study of **Mahadevan et al (2013)** in Malaysia which showed that there was no statistical relation between patient's marital status and caregiver psychological stress.

As for residence of older adult and their caregivers, the present study found that place of residence was not statistically significant with the mean score of total burden, anxiety, depression and psychological distress but those belonging to the rural background had higher mean score of burden, anxiety, depression and psychological stress as they have to travel frequently from far areas to the places where the treatment of cancer is available and eventually exhaust themselves physically, financially and emotionally. The result in accordance to the study of **Price et al (2010)** in Australia who found that there was no differences between patients living in major cities and those in regional/remote locations in terms of the prevalence of caregivers' anxiety and

depression and the study of **Manjeet et al (2014)** in India who reported that the relation to residence was not statistically significant with emotional distress

With regard to relation between educational levels of the older adult, the present study showed that older adults with educational level, their caregivers had higher burden, anxiety, depression and psychological distress. This may be explained by the fact that less educated older adults' patients have poor knowledge and poor coping strategies for managing their chronic disease, further contributing toward functional disability. This leads to more care recipient distress, which means more caregiver distress. The present study revealed that there was a statistical significant relation between level of education and caregiver burden while there was no significant relation to anxiety, depression and general psychological health. This result is in line with a study done in Egypt by **Zayad et al (2013)** who reported that the care recipient's educational level is a predictor of caregiver burden and the study done in **Korea by Park et al (2013)** in which patient educational level not significantly affect caregivers' anxiety and depression level. On the other hand, the study done by **Garlo et al (2010)** who reported that there is no relation between older adults' educational level and caregiver burden and the study done in Nigeria by **Okoye& Aso (2011)** revealed that the level of education of care receiver significantly affect caregiver level of psychological distress.

Moreover, older adults who not having enough income affected caregiver's burden, anxiety, depression and general psychological health negatively than those who have enough income with statistical significant differences. This may be justified by the high cost of cancer treatment and the poor health insurance coverage in Egypt so caregivers of low-income patients with cancer spend a large percentage of their income on cancer treatment which affects their personal savings resulting in more financial cost and so fell burdened and psychologically stressed especially in caregivers with low income. This result in line with a study done by **Lai (2012)** in Canada who reported that caregivers providing care to care receivers with a lower level of financial adequacy rated by the caregiver reported a higher level of caregiving burden than the caregivers who provided care to care receivers with a higher level of financial adequacy. In Korea, a study done by **Park et al (2013)** revealed that anxiety among family caregivers was associated with household income. In USA, the study of **Kim et al (2013)** study

revealed that lower household income increase depressive symptoms in family caregivers.

The health problems of the older adults are also an important determinant of perceived caregiver burden and psychological stress. The present revealed that there is increase in caregivers' burden, anxiety, depression and psychological distress when caring older adults with comorbid diseases than caring those suffering from cancer only with statistical significant difference. This may be due to an older person with many health problems is likely to demand more physical and psychological effort, time and money from the family system. Consistent with previous research on caregiving, the study of **Papastavrou et al (2009)** in Cyprus who reported that the perceived health status of the patient was found to be significant for caregiver's depression and the study of **Lai (2012)** in Canada revealed that caregivers providing care to care receivers who were reported to have more health problems or illnesses reported a higher level of caregiving burden. In contrast, the study done by **Park et al (2013)** in Korea revealed that patient comorbidities were not significant with caregivers' anxiety and depression level.

Unexpectedly, the result of the present study showed that there was no statistical significant relation between duration of cancer and caregiver's burden, anxiety, depression and general psychological health. This may be due to burden and psychological stress is determined by the presence and severity of cancer and the activities of caregiving mediated by physical and psychological aspects and the resources of the environment. This result in accordance with the study done by **Garlo (2010)** who reported that the level of burden showed only minimal change over time, and the relationship between time and burden did not remain significant. Moreover, the study of **Oechsle et al (2013)** in Germany revealed that caregivers' anxiety and depression were not associated with cancer duration and the study of **Mahadevan et al (2013)** in Malaysia revealed that breast cancer duration was not significantly associated with caregivers' emotional stress.

Older adults with cancer are vulnerable to functional decline, which places greater burden on caregivers. The present study showed that caregivers who perceived older adults as more dependent in activity of daily livings and instrumental activity of daily living were more likely to experience high burden, anxiety, depression and

psychological distress with statistical significant difference. One possible explanation for this is that dependant older adults require more time and care from caregivers which restricts the caregiver's ability to socialize and participate in valued activities. This result is consistent with prior studies. First, a study done by **Dumont et al (2006)** in Canada in which family caregivers' psychological distress is strongly associated with the patients' functional performance. Second, a study done in Korea by **Rhee et al (2008)** reported that poor physical performance of the patient was significant to caregiver's depression. Third, a study done in Indian by **Brinda et al (2014)** reported that functional disability was significantly associated with caregivers' burden. Fourth, a study done in California by **Hsu et al (2014)** which indicated that caregivers of patients who required more daily assistance had higher caregiver burden. Fifth, study done in Nigeria by **Akpan-Idiok & Anarado (2014)** who reported that there was a significant ($P = 0.001$) inverse relationship between the caregivers' burden and the care receivers' functional ability. On the other hand, the study of **Limpawattana et al (2012)** in Thailand who reported insignificant relation between number and types of assistance in activities of daily living and caregiver burden.

Regarding the age of the caregivers, the current study showed that the caregivers' burden, anxiety, depression level and psychological distress were lower in young age than middle and old age caregivers. This result may be justified by the fact that the young age has less responsibilities and more time to spend in caring older adults. Despite this, the results showed that there is no significant difference between caregivers' age and mean score of burden, anxiety, depression and general psychological health. This result in line with the study of **Loureiro et al (2013)** in Brazil who reported that caregiver age was not significant with caregiver burden; in India, the study done by **Manjeet et al (2014)** revealed that caregiver age was not statistically significant to anxiety and depression and in Hong Kong, the study of **Chow and Ho (2014)** who reported that spousal age was non-significant for general psychological health. In contrast, the study of **Limpawattana et al (2012) & of Lai (2012)** in which caregiver age was a predictor of burden and the study of **Yiengprugsawan et al(2012)** and **Goldzweig et al (2013)** in which caregiver's age was significant variable in predicting caregiver's psychological distress.

As for sex, females were more likely to perceive higher burden than male. This finding may be justified by the fact that the traditional role of caregiving is often expected of and performed by females. Other explanations of the higher levels of caregiving burden experienced by female caregivers probably include, the multiple caring roles of women and other gender-related challenges, such as spending more time with older adults' patients than men caregivers, receiving less assistance with caregiving tasks and spending more time on intensive personal care and domestic chores. Despite this, the difference in mean burden score between male and female was not statistically significant. Perhaps the similarity between men and women in terms of perceived burden is due to the fact that female caregivers, especially daughters-in-law, spouses, and daughters may not want to violate the cultural standard of the dutiful wife, daughter or daughter-in-law. Another reason may be unlike traditional system where females perform the larger part of caretaking responsibility of ill persons in the family, males are also sharing the responsibility nowadays. This result is consistent with previous studies **Papastavrou et al (2009)**, **Limpawattana et al (2012)**, **Loureiro et al (2013)**, **Chindaprasirt et al (2014)** and **Hsu (2014)**, in which there is no statistically significant relation between caregiver burden and caregiver gender.

Also, the present study revealed that females had a higher level of anxiety, depression and psychological distress than males. This may be due to women positioning themselves as natural caregivers and they did not find caregiving as rewarding as male caregivers. Also, such findings could be explained on the basis of gender differences in coping with stressful situations. The present study showed that there was a statistically significant relation between sex and mean score of anxiety and general psychological health but no statistical relation with the mean score of depression. The same result was reported by a study in India by **Manjeet et al (2014)** in which gender scores were statistically significant with anxiety but not with depression. Also, the result reported by the study of **Hudson et al (2014)** in which general psychological health score was significantly different between male and female. On the other hand, a study in Australia by **Price et al (2010)** revealed that there was no significant difference between male and female carers in the level of anxiety or depression.

Additionally, being married, divorced, or widow showed more caregiving burden, anxiety, depression and psychological distress than caregivers who are single

marital status. This may be due to persons who are never married have more times and less responsibilities to informally take care for the older adults patients than the others. The result of the present study showed that there was no significant relation between marital status and mean score of total burden, anxiety, depression and general psychological health. The same results were reported by **Price et al (2010)** in Australia in which caregiver marital status was not related to caregiver's anxiety and depression and by the study of **Loureiro et al (2013)** in Brazil in which caregiver marital status was not related to caregiver burden.

As regards to educational level, contrary to reported association between low level of education and caregivers' burden and psychological stress, the present study found that caregiver who had high level of education (post graduate education) suffered from high burden, anxiety, depression and psychological distress. This result may be due to family caregivers with a higher education level may be engaged in employment that could be more demanding, resulting in a higher level of stress in combination with caregiving responsibilities, therefore reporting a higher level of caregiving burden and psychological stress. It is possible that higher level education was responsible for greater perception of the complexities involved in care giving.

The present study showed that there was no statistical relation between educational level and mean score of burden, anxiety, general psychological health. While there was a statistical relation between educational level and mean score of depression. The same result reported by **Limpawattana et al (2012)** and **Hsu et al (2014)** in which level of caregivers' education was not significant to caregiver burden. Moreover, the study of **Papastavrou et al (2009)** in Cyprus showed that caregivers' level of education was significant to depression and the study of **Price et al (2010)** in Australia & the study of **Manjeet et al (2014)** in India revealed that there is no association between caregivers' education level and anxiety.

Regarding occupation, there was no statistical significant relation between caregiver occupation and mean score of burden, anxiety, depression. In spite of, caregivers who were not work had less burden, anxiety, depression and psychological distress than those worked or housewives. This result can be explained by family caregivers may be adjusted to employment status and caregiving needs. While occupation was statistically significant with the mean score of general psychological

health. Consistent with the results reported by **Papastavrou et al (2009)** and **Limpawattana et al (2012)** in which occupation was not a predictor of burden and by **Manjeet et al (2014)** in which occupation not statistically significant with caregiver anxiety and depression. On the other hand, the study of **Hunt (2004)** who reported that occupational status not significant with caregiver perceived psychological stress.

Regarding income, caregivers who had not enough income had higher mean score of burden, anxiety, depression and general psychological health than those who had enough income and the differences were significant except with mean score of anxiety. This result may be due to the majority of the older adults had not enough income and live in rural areas, therefore caregivers were more likely to feel the expenses of treatment, transportation, follow up in physicians' special clinics and so on. Also low income can impact to some degree caregivers' social function such as leisure activities resulting in more caregiver burden and psychological stress. This results in line with the study done by **Götze et al (2014)** in Germany who reported that family caregivers' risk of psychological distress was higher if the care was associated with high financial burden. Furthermore, the results of the study done in Egypt by **Salama & Abou El-Soud (2012)** and in Thailand by **Limpawattana et al (2012)** in which income was a predictor of burden. On the other hand, the study of **Alacacioglu (2013)** in Turkey who found that income was not significant with caregiver's level of anxiety and depression.

Caregivers suffering from chronic diseases usually encountered numerous negative effects on both physical and mental health. The results showed that there is statistical significant relation between caregiver burden and caregiver health status. This result may be due to caregivers with a chronic disease had a higher probability to lose physical strength and deterioration of their health to meet patient needs so feel more burdened. This result in line with a study done in Thailand by **Limpawattana et al (2012)**.

On the other hand, caregivers who suffer from disease had slightly higher mean score of anxiety, depression and general psychological health than caregiver who not suffer from disease and with no statistical difference. This may due to the thought of filial piety and commitment to the family according to the Egyptian culture in which caring for the older adults' patients is an obligation for family members even if the

caregiver would suffer from physical illness so suffering from disease not associated with psychological stress. This result in line with the study of **Hunt (2004)** in which high perceived psychological stress was associated with lower general health scores of the spouses of cancer patients. In contrast, the study done in by **Park et al (2013)** in which health problems of the caregivers were significantly associated with their anxiety and depression level.

Hospitalizations among elderly patients with cancer are common and costly (**Manzano et al, 2014**). The present study showed that caregivers who were hospitalized with older adults' patients had higher mean score of burden, anxiety, depression and psychological distress than those who were in the outpatient clinics with statistical significant difference. This result may attributed to hospitalization is associated several stressors such as distance from home, unfamiliar environment, worrying about patient health, employment concerns , financial concerns, changes in sleeping and eating patterns. The same result was reported by the study of **Rhee et al (2008)** in which care setting was statistically significant with caregivers' depression and by **Park et al (2013)** in which care setting (inpatient) was significantly associated with caregivers' anxiety level.

The results of the present study showed that the relationship to the older adult as relatives demonstrated a significant risks among other factors for caregiver burden. The possible explanation was the influence of socio-cultural background. As family is a central value for Egyptian, take caring of the spouse and parents is a willing burden and inevitable duty. Thus, spouse, children and children-in-law reported insignificant burden comparing to the relatives whom are more apart in term of the relationship to the family. The present study revealed that there is no statistical relation between caregiver burden and relation to elderly. This finding was reported by **Papastavrou et al (2009)** and **Hsu et al (2014)**.

On the other hand, there was a statistical significant relation between relationship to older adult and mean score of anxiety, depression and general psychological health with a higher mean score for son/daughter. This result may be due to son/daughter was the main responsible for proving care. This is consistent with the findings of other studies. The study done by **Yousafzai et al (2008)** in Pakistan who reported that the relation to cancer patient was a predictor of psychological distress.

Also, the study of **Zyada et al (2013)** in Egypt showed that the relationship between the caregiver and the care recipient is a predictor of caregiver anxiety and depression and the study done by **Manjeet et al (2014)** in India who reported that caregiver's relationship to the care recipient is an important factor to the emotional distress. In contrast, the study of **Cormio et al (2014)** in Italy did not demonstrate a different effect of the degree of kinship of caregivers on their depression, anxiety level.

The result of the present study showed that, there was no statistical significant difference between caregivers living with older adults and those who not living in the same house regarding mean score of burden, anxiety, depression and general psychological health. This result may be due to caregivers living with the older adult have to manage more stressful and difficult circumstance of caring, as well as spend more time and energy undertaking the care tasks, which would compromise caregiving burden and psychological stress. Also the caregivers who not living with the older adults may experience extra burden and psychological stress when the caregiver has to leave their home and children for several hours a day in order to take care of the older adult, the conflict in organizing activities and time to care their families and the older adults and worrying about health of the patient in the time they are away from them. The same result was found by **Hsu et al (2014)** in which there was no statistical significant relation between living with elderly and caregiver burden. On the other hand, this result in contrast with a study done in Egypt by **Zyada et al (2013)** which showed that living with the care recipient in the same residence is a predictor of caregiver anxiety and depression.

Regarding the availability of secondary caregivers, the result of the present study showed that caregivers who were primary caregivers had higher mean score for burden, anxiety, depression and general psychological health than those who had secondary caregivers helping in the care of the older adults' patient. This is may be due to the fact that being the main caregiver means taking the main responsibility for caregiving, which is a very distressful job. Despite this, there were no statistical significant differences between those who had secondary caregivers and those who had not regarding studied variables. These results indicate that the strain of caregiving may be determined to a large extent by the caregivers' psychological response to their role, rather than by the objective tasks they perform to care for their older adults' patients.

These results in agreement with the study done in The United States of America (USA) by **Kim et al (2012)** who reported that the number of helpers did not have a significant effect on decreasing caregiver burden and the study done in Malaysia by **Mahadevan et al (2013)** who reported that perceiving support from other was not significant to caregivers' emotional stress. On the other hand, the study of **Salama & Abou El-Soud (2012)** in Egypt found a significant relation between having secondary caregiver or not and caregiver burden. Also, a study done in Egypt by **Zyada et al (2013)** found that having more than one additional caregiver to help is a predictor of caregiver anxiety and depression.

Concerning period of caregiving, the present study revealed that duration of caregiving was not statistically significant with caregiver burden and depression, although the mean score of burden and depression increase with increasing period of caregiving. While there is statistical significant relation between period of caregiving and mean score of anxiety and general psychological health. This result in agreement with a study done in Pakistan by **Yousafzai et al (2008)** who reported that duration of caregiving significantly associated with caregiver's psychological stress. In Korea the study of **Park et al (2013)** revealed that the duration of caregiving was not significant predictors of anxiety and depression. Moreover, the study of **Hsu et al (2014)** in California who reported that the length of time caring for elderly patient not significant with caregiver burden. On the other hand, there was a statistical significant relationship that existed between duration of care and caregivers' burden in the study done by **Akpan-Idiok & Anarado (2014)**.

Additionally caregivers who spend more hours daily in caring older adults had higher mean score of burden, anxiety, depression and general psychological health than those who spend less hours daily with statistical significant difference. This result may be justified by the fact that spending more time means spending more physical and psychological effort and the caregivers would not have more time for themselves which may affect their work, personal life and also makes it difficult to find spare time away from their caregiving to relax or attend social activities and relieve themselves. Consistent with previous studies: the study of **Kim et al (2012)** who reported that the number of hours devoted to caregiving was a significant predictor of caregiver burden, the study of **Zyada et al (2013)** in Egypt reported that the duration of caregiving

(>6 months) is significantly correlated to caregiver anxiety and depression and is a predictor of caregiver burden and the study of **Brinda (2014)** who reported that longer hours of informal caregiving significantly worsened caregivers' burden. While **Park et al (2013)** study found that time spent in caregiving per day has a significant effect on anxiety but not depression.

In the present study there was statistical significant correlation between caregiver burden, anxiety, depression and general psychological health. Thus caregivers who suffered from burden had high level of anxiety, depression and psychological distress. The result demonstrated that caregiver burden was a positive predictor of psychological health status and vice versa. Consistent with previous studied: In Canada, the study of **Dumont et al (2006)** revealed that high psychological distress was significantly associated with the caregiver's burden. In Cyprus, the study of **Papastavrou (2009)** revealed that all the Pearson correlation coefficients between burden and depression were highly significant ($p < 0.01$) and positive (i.e. when burden is high then depression is also high). In the United Kingdom (UK), the study of **Phillips (2009)** revealed that caregiving burden were associated with anxiety score. In Turkey, the study of **Evci et al (2012)** showed that there is correlation between caregiver burden and general psychological health. In USA, the study of **Macaraeg & Smith (2013)** revealed that caregiving burden is closely associated with psychological distress. In Germany, the study of **Oechsle et al (2013)** reported that caregivers' anxiety and depression were significantly correlated ($p < 0.001$). In Spain, the study of **Costa-Requena et al (2014)** reported that caregiver psychological distress was a significant predictor of burden.

The high caregiving burden and psychological distress among family caregivers of older adults with cancer in this study reflect that caregivers are hidden patients. Despite this, those caregivers are neglected by physician, nurses and other health professionals. In the study setting, physician and nurses are responsible management of cancer, while caregivers not included in the care plan, they receive little guidance from providers, don't know how to assume the caregiver role, aren't familiar with the type and amount of care needed, and don't know how to access and utilize resources, and lack knowledge about cancer.

According to **Given & Sherwood (2006)**, caregivers of older adults with cancer often feel underprepared when taking on a caregiver role because they are misinformed, or don't have full information, on the progression the disease may take or the treatment needed for it. There is also a lack of information or communication between the caregiver and medical staff regarding how they should provide care. Often, caregivers have little knowledge of the resources available to them to assist in their roles, or to help them cope with the psychological difficulties they themselves are having. Educating the caregiver has been shown to decrease stress levels.

These findings highlight the importance of early assessment, nursing diagnosis and potential interventions to reduce cancer family caregivers' burden and psychological distress and help them to cope with their caregiving role. Nurses and other healthcare teams should acknowledge informal caregiver and older adult patient as one unit of care and need to balance patients' and caregiver's need for information, support and sense of medical partnership.