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Effect of Elderly Health Problems on Caregivers' Health at Rural Areas in Sharkia Governorate, Egypt

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Abstract:
Background*: Increasing life expectancy and the progressive aging have resulted in a huge health problems and age related functional limitations of older adults which result in increasing level of dependency. Caring for an elderly relative can result in problems such as care-giving burden, stress and depression.*
Aim of the study*: The current study aimed to investigate the effect of elderly health problems on caregivers' health at rural areas in Sharkia Governorate, Egypt.*
Design: *A cross- sectional descriptive research design was used to conduct this study.*
Setting*: The present study was conducted at Ekwa village, Diarb Negm district in Sharkia Governorate.*
Sample: *The present study enrolled 110 elderly and their caregivers (110) were selected by using a multistage cluster random sampling technique.*
Tools: *Two categories of tools were used; A) Tools for elderly persons which included socio-demographic characteristics & medical history, assessment of elderly needs, and General Health Questionnaire. B) Tools for caregivers which included socio-demographic characteristics, modified version of burden interview, and caregiver self-assessment questionnaire.*
Results: *Elderly had at least two diseases (comorbidity) especially diabetes and hypertension (22.8% and 26.8%) respectively, 50% of them were stressed and 58.2% of them were dependent in activities of daily life. In addition, 57.3% of caregivers aged around 40 years, and 57.3% were females, whereas, 45.5% of caregivers had sufficient or insufficient income. Moreover, 63.6% of caregivers left their job for caregiving and most (90.9%) of them were distressed.*
Conclusion: *Caregiving is a stressful task as it has a notable effect on caregiver's health especially when elderly are older, dependent, stressed, have comorbidity and with increasing caregiving hours.*
Recommendations: *Rural areas should be enriched with affordable elderly care services to reduce caregivers' burden, experimental study is suggested to manage caregiver's burden, and the study can also be replicated in urban areas or on larger samples.*
Keywords: *Elderly, Elderly Health Problems, Caregivers, Caregiver's Health, Rural Areas, Sharkia Governorate*

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I. Introduction

The world's population is aging; virtually every country in the world is experiencing growth in the number and proportion of older persons in their population. As population aging, the increasing share of older persons in the population is poised to become one of the most significant social transformations of the twenty-first century. [1] In Egypt, Life Expectancy at birth gained 10 years from the period 1980-1985 to the period 2005-2010, increasing from 59.9 years to 69.9 years. It is expected to reach 77.3 years in 2045-2050. The proportion of the elderly population (65+) has also been increasing and is expected to reach 12.3 % in 2050. [2] In Egypt the percent of older people "60 years of age and more" was 4.4% in 1976, 5.75% in 1996, and raised to 6.27% in 2006. The percentage is projected to be 6.9% in 2015, 9.2% in 2021, and it is expected to reach 20.8% in 2050. This means that, around 20 million Egyptians will be categorized as elderly by that time; this is a big number that resembles a full nation in some parts of the world. [3]

Old age is not a disease in itself, but the elderly are vulnerable to long term diseases of insidious onset such as cardiovascular illness, stroke, cancers, diabetes, musculoskeletal and mental illnesses. They have multiple symptoms due to decline in the functioning of various body functions. [4] Aging in rural communities poses unique challenges that can have an impact on older adult's health. [5] Early health problems in rural areas

might be due to lack of medical facilities and poor economic conditions, the rural aged suffer from nutritional and psychological problems when compared to urban area. [6] As population aging people tend to take the responsibility of caring for their older family members in their own home, caregivers serve as home health aides and companions. They may help feed, dress, and bath the patient. Caregivers arrange schedules, manage insurance issues, and provide transportation. They are legal assistants, financial managers, and housekeepers. [7]

Caregiving is a stressful task that can require great physical effort, particularly in special cases such as mentally impaired relatives who develop behavioral problems and even aggressive habits. Caregiving competes with leisure time, which is usually spent with family members and helps maintain healthy family relationships. The time for leisure shortened when caregiving lasts for hours or must be combined with a regular workday. Caring for co-residing elderly, in particular, not only influences a family's daily life but decreases the well-being of both caregivers and their family members. [8] Family caregivers are essential partners in the delivery of complex health care services, unlike professional caregivers such as physicians and nurses. Informal caregivers, typically family members or friends, provide and manage multiple health conditions of elderly. [9]On the other hand, family caregivers invest much time in providing care, making it difficult for them to find time to care for their own health. Furthermore, caregivers may be unlikely to assume healthy behaviors given that a low percentage of them are reported to undergo medical check-up and there are a few opportunities for them to become aware of any illnesses they may have and increase the risk of caregiving burden. [10]

Caring for an elderly relative can result in problems such as care-giving burden, stress and depression. The burden of caregiving refers to the physical, psychological, and social impact that caring for older persons has on the caregiver. [11]Caregiver burden has been defined as a multidimensional response to the negative appraisal and perceived stress resulting from taking care of an ill individual. Caregiver burden threatens the physical, psychological, emotional and functional health of caregivers. [12]Shared care-giving can reduce the stress among the caregivers in many ways. Care-giving has been associated with burden from having to carry out numerous tasks ranging from cooking and cleaning to managing patient's symptoms, thus, the ability to share these tasks with others will reduce the burden of the primary caregiver. This may lead to more time-off from care-giving, therefore, allowing time for caregivers to engage in their own leisure activities and to look after their own health. [13] Highlight the importance of practical interventions by gerontological nurse and other health professionals in order to improve the conditions and functional health of the elderly, as well as guidance and supervision for the care provided by family caregivers. It is remarkable that the goal of these interventions should not only equip family members as caregivers, but also as people who themselves need care. [14]

Significance of the study:

World population continues to grow older rapidly as people tend to live longer. When the global population reached 7 billion in 2012, 562 million (or 8%) were aged 65 and over. [15]In addition, while the benefits of active informal caregiving result in better patient management and lower resource utilization for the healthcare systems, the personal cost to the family caregiver can be substantial. As a result, informal caregivers of older adults often experience significant long-term burden of care. [16&17]Care provision can still come at a certain cost in particular; it is time consuming, mentally stressful, and physically exhausting, which can negatively affect the caregiver's health. [8] Caregiving may presents burden on the informal caregivers' especially in rural areas not only due to financial costs or long term burden of care, but also due to educational level, tradition, customs, values and believes (cultures), which consider caring for elderly in institutions stigma to family members. Hence, the present study was designed to investigate the effect of elderly health problems on caregivers' health at rural areas.

Aim of the study:

The current study aimed to investigate the effect of elderly health problems on caregivers' health at rural areas in Sharkia Governorate, Egypt.

This aim has been achieved through the following objectives:-

1. Identify the elderly health problems in rural areas.
2. Estimate the levels of burden among elderly caregivers' in rural areas.
3. Determine the relationship between the elderly health problems and caregivers health at rural areas.

II. Subjects And Methods

2.1. Research Design:-

Cross sectional descriptive design was used to investigate the effect of elderly health problems on caregivers' health at rural areas in Sharkia Governorate, Egypt.

2.2. Study Setting:-
The existing study was conducted at Ekwa village which was randomly selected Diarb Negm districts Sharkia governorate.

2.3. Subjects:-
The study sample comprised 110 elderly & their caregivers (110), according to the **following inclusion criteria;** both sexes; aged 60 years or more; willing to participate in the study; able to communicate, and diagnosed with one or more health problems. Caregivers' were both sexes, primary caregivers, willing to participate in the study, and able to communicate.
Sampling technique: A multistage cluster sampling technique was the most appropriate method for the selection of the elderly and their caregivers to be included in the study from the above mentioned setting and who fulfilled the study inclusion criteria.
Sample size calculation: The Sample size was calculated based on prevalence of caregiver's burden 21% in elderly rural personnel in Egypt [18], and the number of elderly people in Ekwa Village, Diarb Negm District, Sharkia Governorate was 588 [19] using software EPI- Info Package, with confidence 95% and power of the test 80%, the sample size was calculated to be 110 elderly persons and their caregivers (110).

2.4. Tools for data collection:-
The tools used for collecting data of the present study were divided based on two categories: Tools for elderly persons &Tools for caregivers.
A. Tools for elderly persons: Three tools were used they were:
Tool I: Socio-demographic characteristics and medical history

- **Part 1: Socio-demographic characteristics modified after El-Gilany et al.** [20], it was used to assess the socio-demographic characteristic of the elderly, as it was used to collect data about educational level, occupation, monthly income …etc. **Scoring system:** to determine the socio-economic class of the elderly by using this modified scale, the scoring system was calculated as follows: score less than 50% would be considered as a low social class, score from 50% to less than75% would be considered as a middle class, and score more than 75% would be considered as a high social class.
- **Part 2: Medical history:** This part was developed by the researcher to collect data about past and present diseases, duration of diseases, medication taken and frequency of follow up.

Tool II: Assessment of daily living activities scale by Katz and Akpom [21], it used to assess six main activities of daily life namely bathing, dressing, going to toilet, mobility, continence, and feeding. **Scoring system:** Each of these six functions was measured and scored according to the elderly actual performance, and categorized into one of three levels of dependence, these were "totally dependent "scored 3, "Need assistant" scored 2 and " Totally independent " scored 1,so that a higher score indicates more dependence. The scores of the six domains were summed-up, and the total score ranges from 6 to18. According to Katz and Akpom, the total score classified into three categories: Totally dependent scored13-18; Need assistance; scored7-12, and totally independent if the score was 6.

Tool III: General Health Questionnaire (GHQ-28) [22]
It was used as a screening device for identifying minor psychiatric disorders in the general population and within community or non-psychiatric clinical settings such as primary care or general medical out-patients. GHQ-28: scaled version – assesses somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. Scoring system: For each statement, the respondent checked whether it was worse than before or better than before. These scored 1or zero respectively, with a maximum total of 28 points. The statements are categorized into four domains: "Somatic, Anxiety/insomnia, Social dysfunction, and severe depression." For each domain and for the total scale, the scores were summed-up so that a higher score indicated more stress. These scores were converted into percent scores. They were then categorized into "high stress: 60%+," and "Low stress: <60%."

B. Tools for caregivers: Two tools were used they were:
Tool I: Socio-demographic characteristics and modified version of burden interview

- **Part 1: Socio-demographic characteristics modified after El-Gilany et al.** [20], it was used to assess the socio-demographic characteristic of the elderly, and it was used to collect data about educational level, occupation, monthly income …, etc. Besides one question about effect of caregiving on work. **Scoring system:**, to determine the socio-economic class of the elderly using this modified scale, the scoring system was calculated as follows: score less than 50% would be considered as a low social class, score from 50% to

less than75% would be considered as a middle class, and score more than 75% would be considered as a high social class.

- **Part 2: Modified version of burden interview by Zarit et al. [23]** Zarit Burden Interview (ZBI) is a 22-item instrument for measuring the caregiver's perceived burden from providing family care. The questions focus on major areas such as caregiver's health, psychological well-being, finances, social life and the relationship between the caregiver and the patient. Statements of this scale reflect how people sometimes feel when taking care of another person. There were no right or wrong answers. **Scoring system:** The 22 items were assessed on a 5-point Likert scale, ranging from 1="never", 2= "rarely", 3= "sometimes", 4="quiet frequently" and 5="nearly always" for a maximum total of 110 points. Norms for the Burden Interview have not been computed, but estimates of the degree of burden can be made from preliminary findings. The scores were summed-up so that a higher score indicated more burdens. These scores were then categorized into "no burden: <20," "low: 20-<40," "moderate: 40-<60," and "High: 60+."

Tool II: Caregiver self-assessment questionnaire Developed by **Epstein et al. [24]**

It used to assess caregivers' self-evaluation as they lose sight of their own well-being. It composed initially of 18 questions such as "had trouble keeping my mind on what I was doing", "felt ill", "had back pain". Each question was answered by either yes or no, except question 17 and 18 which were open ended. **Scoring system,** each statement was scored 1 for "yes" and zero for "No" and the scores of statements were summed-up so that a higher score indicated more distress. To interpret the score chances were that, primary caregivers were experiencing a high degree of distress if any of the below was true: If answered "Yes" to either or both questions 4 and 11, If total "Yes" scores = 10 or more, If the score on question 17 was 6 or higher, If the score on question 18 was 6 or higher. **For item 17**, family caregivers were asked to rate their level of stress on a 1-10 basis. **For item 18**, they were asked to rate their perception of their current health in comparison to their health one year ago. A simple scoring system allows family caregiver themselves to score their results and to determine whether or not they were highly stressed.

2.5. Preparatory phase:-

A review of the available past &current related literature and theoretical knowledge of various aspects of the study was done using available books, articles at periodicals or magazines, or internet, to be acquainted with the research problem and develop the study tools.

2.6. Content validity:-

The validity of the tools was done by group of panel who were three experts from nursing and medical faculty staff who reviewed the tools and ascertained clarity, relevance, comprehensiveness, and understandability.

2.7. Content reliability:-

Reliability of tools was assessed through estimating test-retest reliability and measuring their internal consistency. Test-retest reliability was done by the researcher through administrating the same tools to the same subjects under similar conditions on two or more occasions. Internal consistency of the tools was assessed by calculating Cronbach alpha coefficients. Their reliability proved to be high as shown by the values of Cronbach alpha coefficient (0.983for Katz, and 0.978 for GHQ,).

2.8. Pilot study:-

A pilot study was carried out on 10% of the study subjects (11 elderly and their caregivers) .The purpose of pilot study was to test the questions for any ambiguity, and to assess the practicability and feasibility of the tools. It also helped the researcher to determine the time needed for filling out the forms. Those who shared in the pilot study were excluded from the main study sample.

2.9. Fieldwork:-

Once permission was granted to proceed with the study, the researcher started to prepare a schedule for collecting the data by dividing villages into streets (clusters) with the assistance of Omda (the high authority in village) who assigned a facilitator in the same village to facilitate the researcher's work. The researcher asked for the primary caregivers, then interviewed elderly and caregivers separately. The researcher usually started by introducing herself to participants, the aim and nature of study disscused briefly, and reassured them that information obtained is strictly confidential and would not be used for any purposes other than research. Both elderly and caregivers either (males or females) were interviewed individually in their home to collect the necessary data. Time estimated for filling out the questionnaire sheets ranged from 15-20 minutes for elderly and 20-25 minutes for their caregivers. The researcher visited the village 3days/week (Saturday, Monday and Friday) from 2PM to 8PM. Data collection ran over a period of two months from mid of august 2016 to mid of October 2016.

2.10. Ethical Considerations:-

The study protocol was approved by The Research Ethics Committee at the Faculty of Nursing, Zagazig University. An informed consent for participation was taken from each of the elderly subjects after full explanation of the purpose of the study. They were notified that they could withdraw at any time and were assured that any information taken from them would be confidential and used for the research purpose only. The researcher phone number and all possible communicating methods were identified to the participants to return at any time for any explanation.

2.11. Administrative Design:-

An official letter containing the aim of the study was issued from faculty of nursing Zagazig University to Omda of Ekwa village explaining the nature and aim of this study and seeking facilitating the role of researcher.

2.12. Statistical Design:-

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. Cronbach alpha coefficient was calculated to assess the reliability of the tools through their internal consistency. Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher exact test was used instead. In larger than 2x2 cross-tables, no test could be applied whenever the expected value in 10% or more of the cells was less than 5. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. In order to identify the independent predictors of stress, stressors, and independence scores, multiple linear regression analysis was used and analysis of variance for the full regression models was done. Statistical significance was considered at p-value <0.05.

II. Results

Regarding socio-demographic characteristics of elderly in the study sample, it was found that 56.4% of elderly aged less than 70yrs, 57.3% were females and 58.2% were un married. Considering educational level, 78.2% of them were none educated. Referring to pervious job, 69% were un employed /housewifes. Additionaly, 62.7% of elderly had insufficient income and 81.8% owned their residence respectively. As to socio-demographic characteristics of caregivers in the study sample, it was found that 57.3% of caregivers aged 40years or more, 57.3% were females and 59.1% were married. Referring to educational level and job, 41.8% of caregivers had university education and 45.5% were workers. Additionally, 45.5% of caregivers had insufficient income, 73.6% lived in their own house and 63.6% of caregivers left their job for caregiving.

Concerning chronic disease among elderly in the study sample, **table1** shows that 53.6% had hypertension, and each elderly had at least two diseases. The mean duration of illness was 10 years, and 95.5% of elderly were on regular medication.

As to independence in the activities of daily life among elderly in the study sample, **table 2** shows that 58.2% of elderly were dependent in all activities of daily life, meanwhile, 41, 8% were totally independent. **Table 3** illustrates characteristics of general health among elderly in the study sample. As the table reveals, the highly reported stress characteristics were anxiety/insomnia, whereas, the lowest was severe depression. Totally, 50% of elderly were stressed.

Table 4 illustrates caregiving burden and stress among caregivers in the study sample. As the table shows, 40% of caregivers had severe burden, 67.3% had high self esteem. The mean score of fatigue perception was 6.8±2.8 compared to 6.1±3.0 for mean score of good health perception. Totally 90.9% of caregivers were distressed.

Table 5 reveals statistically significant relations between caregiver's burden, elderly independence and total general health questionnaire (**p**=0.03&**p**<0.001 respectively), where high percentage of caregivers who had highburden and were stressed cared for dependent elderly and were stressed. Concerning caregiver burden score, **table 6** demonstrates that general health questionnaire and leaving job for caregiving were the statistically significance independent positive predictors of caregivers' burden score. The model explains 41% of the variables in caregiver's burden score. None of the other elderly characteristics had a significant influence of the score.

III. Discussion

Health problems tend to increase with advancing age and very often the problems aggravate due to neglect, economic status, poor nutrition, and inappropriate dietary intake. Elderly health problems in rural areas might be due to lack of medical facilities and poor economic conditions, the rural aged suffer from nutritional and psychological problems when compared to urban areas. [6] Caregiving has always been important; as the improvements in health care, nutrition and education over the last several decades have resulted in increased life

expectancy and a subsequent growth in the aging population. [25] Today, family caregivers play an essential role in system of care by providing a significant proportion of health and long-term care for the chronically ill, disabled, and aging. [26] Here after, the current study aimed to investigate the effect of elderly health problems on caregivers' health at rural areas in Sharkia Governorate.

Concerning socio-demographic characteristics of elderly in the study sample, the results of the current study clarified that more than half of the participants were females and un married, these findings could be attributed to the comparatively higher longevity of life in females. Additionally, a higher percentage were un employee and living with family, this finding could be due to the adverse effects of changes result from aging process that lead to decrease in the elderly ability to work and increase their level of dependency added to the traditional role of women at rural areas as a housewife. These results go in line with the study carried by **Abdul Manaf et al.** [27] in Malay village, Malasia where there were a higher percentage of females compared to males among the elderly respondents. There was also a much higher percentage of widowhood among the females compared to males. The majority of the respondents were living with family and not working.

Based on the findings of the current study, more than two third of elderly belonged to high social class. This might be attributed to the simplicity of elderly life in addition to their ability to save money as they have no responsibilities towards education of children or marriage, and they have their pension or depend on their family members. In contrast, the results of the study conducted by **Thakur et al.** [28] in India, found that the majority of older population at rural areas belonged to low social class. This difference might be attributed to the differences in the standards of living between Egypt & India. As regards educational level of the studied elderly, the results of the current study pointed out that most of them were illiterate. This might be attributed to the traditional role of most elderly at rural areas as farmers, especially in the past which lead to dropping out from school for farming activities. In agreement with this result, **Tiwari et al.** [29] in India found that the majority of the studied elderly in twelve villages at rural areas were illiterate.

As to demographic characteristics of caregivers in the study sample, the findings of the current study revealed that more than half of caregivers aged 40years or more, were married, and had sufficient income. Such findings might be attributed to that younger family caregivers are un able to take the responsibilities of caregiving of older adults and feel more burdened. Also, the lack of psychological preparation and experience, because younger family caregivers often take up the role without much preparation. In the same context with this result**, Lai** [30] in Canada found that over half of the caregivers were between 35 and 54 years of age. About three quarters of the caregivers interviewed were married, and about half reported sufficient income. In the same stream, study carried out in Canada by **Duggleby et al.** [31] clarified that the mean age of caregivers was 59.0 years and the majority of caregivers were married.

As regards characteristics of caregivers, the findings of the current study clarified that more than half of the studied caregivers were females. This might be attributed to the traditional role of caregiver which is often expected from and performed by females. Also, women provide more intensive care than do men for example, women are more likely to perform tasks such as cooking and cleaning, which often require more time or more frequent contact than do the tasks that males are more able to perform, such as financial management and home repairs. Likewise, **Awad et al.** [32] in Ismailia, Egypt found that caregivers were mostly females. On the contrary, male participation as caregivers was important as shown for example in a study conducted by **Gonçalves et al.** [33] in Portugal who reported an increase in male caregivers.

Concerning educational level of caregivers, more than two fifths of them had university education. Possible explanation of such result is that family caregivers with a higher educational level nowdays may not be engaged in job, and they may have a responsibility towards their children and home, also they may be trusted more in their ability to understand doctor's directions regarding medication schedule compared to those with lower educational level. In the same vein, **Lai** [29] in Canada found that closed to three quarters of the caregivers reported an education level of postsecondary or above. On the contrary, **Anjos et al.** [34] in Portugal clarified that low education may contribute to the role of caregiver being assigned to family members, since entering the labor market is harder for individuals with low education. Thus, it is more probable that these people dedicate themselves to housework and caring for dependent family members as an extension of this activity. The current study findings revealed that elderly had comorbidities, where the commonly reported diseases were hypertension followed by diabetes, cardiac diseases and rheumatic diseases. Such result can be explained by that age related diseases are diverse due to changes in cardiovascular system, respiratory system, endocrine system.., etc. In the same context, the results of study conducted in rural Northeast Thailand by **Sudnongbua et al.** [35] revealed that, elders in rural population have multiple health problems that cause implications for their abilities to work.

Regarding the number of comorbidities or diseases, similar findings have been noted in Thailand by **Liang et al.** [36], where rarely of the rural elderly had no comorbidities, where less than half of them had one or two, nearly about one third reported three or four and the rest of them had five or more. As well, **Dziechciaz et al.** [37] in Poland found that all respondents were suffering from one to several diseases, while less than one

quarter of them were completely dexterous in complex life actions. Based on the results of the study carried by **Thakur et al. [28]** in Markal village, United States of America, the prevalence of hypertension was higher in the rural elderly population. Meanwhile, other studies in Kathmandu**,** [38] and in Tunisia **[39]** found that the prevalence of diabetes was higher in the rural elderly population. Moreover, **Falsarella et al. [44]** in Parazil indicated that less than one quarter of elderly patients at rural areas had been diagnosed with rheumatic diseases, with less than half of them reporting hand and knee joint symptoms.

As to elderly dependence in activities of daily living, it is obvious that more than half of the studied elderly were dependent. This is probably because of increasing age of elderly which is an important risk factor for the emergence of morbidities as arthritis, osteoarthritis or osteoprosis which massively affects activity level. In the same vein, slightly lower percentage was reported by **Tiwari et al. [29]** in Varanasi, India who found that less than half of the elder populations at rural area were dependent in activities of daily living. This point is confirmed by the study carried out by **Xavier et al. [41]** in Brazil who found that the functional dependence in elderly with health problems was prevalent among nearly all participants, with the more compromised ADL being bathing. Health problems are a predictor for dependency in elderly, increasing the chance of functional loss by five times, the chance of functional deterioration by 3.5 times, and reducing the score of the Katz Index by 0.794 points. As well, **Navarro et al. [42]** in Mexico, who found that old age and frailty was a predictor for adverse health-related outcomes, including ADL disability and death.

Referring to caregiver's distress self-assessment, the findings of the present study revealed that nearly all caregivers in the studied sample were distressed. This might be attributed to being worried about their loved person as they feel with great responsibilities towards them. Moreover, elderly persons in the studied sample of the current study were stressed, dependent and had comorbidities. Additionally, the lack of knowledge and skills for care provision often linked to feeling of anxiety and distress that impact negatively the care delivered, as well as in caregiver's own health. Also, the lack of information and lack of support to deal with the care for the impaired elder. As well, insufficient income and spending much time with elderly may put caregivers in the challenges of actually providing informal caregiving. In the same context, **Shankar and Muthuswamy [43]** in Australia found that all caregivers experienced distress arising out of feelings of helplessness and loss of control, tiredness, isolation, fears for their (and their relative's) safety during periods of escalating mental health crisis, and anxiety related to their relative's future. Being an informal caregiver has significant consequences for one's mental health. In the same context, **Osman et al. [44]** in Malaysia found that many caregivers experienced severe mental health problems associated with their care-giving roles. Similar findings were reported by **Mahadevan et al. [13]** in Malaysia who found that caregivers who did not share their care-giving burden were 2.8 times more likely to become stressed.

As to levels of burden among elderly caregivers in rural areas, the result of the present study clarified that less than half of caregivers had severe burden. Such result can be explained by that elderly generally have difficulty accepting the condition of dependency and the need to have someone taking care of them, contributing to the overload among family caregivers. Moreover, most caregivers claim to be affected by a chronic or acute disease, perceive their health as fair or poor, and present severe or mild burden. Furthermore, increased level of burden among primary caregivers may also be related to the long time dedicated to care, in addition to socioeconomic status of the studied elderly and their caregivers. On the other hand, caregivers who live in multigenerational arrangements, where there is a greater number of people in the house can generate more demands from the family caregiver in addition to taking health care of the impaired elder.

Concerning the relation between caregiver's burden and elderly independence in ADL and GHQ, a statistically significant relation was found between caregiver's burden, elderly independence and total general health questionnaire where higher percentage of burden among caregivers was in caring for elderly who was dependent and stressed. This may be explained by the increasing in the level of dependency especially in performing activities of daily living, or in case of worse health condition of elderly with increasing the level of burden among primary caregiver's as they suffer from great responsibilities towards their loved person, households, job and themselves. On the other, hand dependency and worse health conditions of older adults result in increasing caregiving hours/day which is finally lead to burden. In agreement with these results, **Loureiro et al. [14]** in Brazil found that, those families headed by the impaired health condition and dependent elder were the ones with the highest mean burden.

The current study results revealed that general health questionnaire and leaving job for caregiving was statistically significant independent negative predictor of caregivers' stress score, this finding could be due to that it is known that caregiver's stress increasing when elders have two or more comorbidity or when they are impaired in general health. Also, caregiver's have to leave their job when they felt overwhelmed from caregiving. These findings go in line with **Chung et al. [45]** in the United States of America who found that caregivers' depressive symptoms were predicted by their own lower functional status, lower perceived control and severe perceived burden.

Taken as a whole, these findings provide support for emphasizing early community interventions through redesigning in-home services that better meet the health needs of elderly and provide more efficacious respite to caregivers, specifically in rural communities.

IV. Conclusion

Elderly in rural areas aged around 70yrs, had at least two diseases (comorbidity) especially diabetes and hypertension, and propably had insufficient income. Whereas, caregivers in rural areas aged around 40 years, were married, females, working and some had insufficient income. Meanwhile many caregivers left their job for caregiving. Ultimately, caregiving is a stressful task as it has a notable effect on caregiver's health especially when elderly are older, dependent, stressed, have comorbidity and with increasing caregiving hours.

Recommendations

On the basis of the current study findings, the following recommendations are suggested: Rural areas should be enriched with affordable elderly care services to alleviate elderly health problems and consequently reduce caregivers' burden. Caregivers should be equiped with scientifically sound methods of coping with stress. Intervention studies are suggested to assist the caregivers to engage in activities that promote their own health and to build effective buffers against being overwhelmed and distressed.

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Table 1 Chronic diseases among elderly in the study sample (n=110)

Table 4: Caregiving burden in the study sample (n=110)

Chronic disease	Frequency	Percent
Chronic diseases:		
Diabetes	44	40.0
Hypertension	59	53.6
Cardiac	29	26.4
Rheumatic	26	23.6
Others@@	85	71
No. of diseases:		
Range	1-5	
Mean±SD	2.2±1.1	
Median	2.0	
Duration of illness (years):		
Range	<1-26	
Mean ±SD	10.5±6.6	
Median	10.0	
On regular medication:		
No	5	4.5
Yes	105	95.5

Caregiving burden	Frequency	Percent
Caregiving burden (Zarit):		
None	4	3.6
Mild	24	21.8
Moderate	38	34.5
Severe	44	40.0
Self-esteem:		
Low	36	32.7
High	74	67.3
Fatigue perception (max=10):		
Range	1-10	
Mean±SD	6.8±2.8	
Median	8.0	
Good health perception (max=10):		
Range	1-10	
Mean±SD	6.1±3.0	
Median	6.0	
Caregiver distress self-assessment:		
No distress	10	9.1
Distressed	100	90.9

@Responses were not mutually exclusive
@@ (cancer, gastric, renal, renal failure, osteoporosis and hepatic)

Independence in the Activities of Daily Life (ADL) among elderly in the study sample (n=110)

Independent in ADL (Katz scale):	Frequency	Percent
Bathing	54	49.1
Clothing	59	53.6
Toileting	55	50.0
Mobilization	56	50.9
Elimination	57	51.8
Feeding	58	52.7
Total Independent:		
• Independent	46	41.8
• Dependent	64	58.2

characteristics	Frequency	Percent
High stress:@		
Somatic	73	66.4
Anxiety/insomnia	74	67.3
Social dysfunction	69	62.7
Severe depression	59	53.6
Total General Health Questionnaire (GHQ):		
• Stressed	55	50.0
• Not stressed	55	50.0

Table 3: General Health among elderly in the study ample (n=110).

@Responses were not mutually exclusive

Table 5: Relations between caregiver's burden and elderly independence in ADL and GHQ

Elderly	Burden						X^2 Test	p-value
	Low		Moderate		High			
	No.	%	No.	%	No.	%		
Total Katz:								
• Independent	17	37.0	19	41.3	10	21.7		
• Dependent	11	17.2	19	29.7	34	53.1	11.75	0.003*
Somatic:								
• Not stressed	16	43.2	17	45.9	4	10.8		
• Stressed	12	16.4	21	28.8	40	54.8	20.90	<0.001*
Anxiety/insomnia:								
• Not stressed	14	38.9	16	44.4	6	16.7		
• Stressed	14	18.9	22	29.7	38	51.4	12.60	0.002*
Social dysfunction:								
• Not stressed	17	41.5	19	46.3	5	12.2		
• Stressed	11	15.9	19	27.9	39	56.5	21.85	<0.001*
Severe depression:								
• Not stressed	18	35.3	22	43.1	11	21.6		
• Stressed	10	16.9	16	27.1	33	55.9	13.72	0.001*
Total GHQ:								
• Not stressed	21	38.2	22	40.0	12	21.8		
• Stressed	7	12.7	16	29.1	32	58.2	17.04	<0.001*

Table 6: Best fitting multiple linear regression model for the caregiver burden score

Caregiver burden	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	95% Confidence Interval for B	
	B	Std. Error				Lower	Upper
Constant	62.86	5.26		11.953	<0.001	52.43	73.29
Elderly:							
No. of diseases	7.08	2.80	0.42	2.531	0.013	1.53	12.64
No. of medications	-6.31	2.44	-0.41	2.583	0.011	-11.15	-1.47
Katz score	-1.49	0.59	-0.22	2.542	0.013	-2.65	-0.33
GHQ	-0.63	0.16	-0.33	3.883	<0.001	-0.95	-0.31
Caregiver:							
Education	-1.80	0.60	-0.22	3.020	0.003	-2.99	-0.62
Left job	11.34	3.08	0.28	3.681	<0.001	5.23	17.45

R-square=0.41Model ANOVA: F=13.72, p<0.001

*Eman Shokry Abd Allah. "Effect of Elderly Health Problems on Caregivers' Health at Rural Areas in Sharkia Governorate, Egypt." IOSR Journal of Nursing and Health Science (IOSR-JNHS) , vol. 06, no. 06, 2017, pp. 39–49.