The Difference in Burden Experienced by Male and Female Caregivers of Dementia Patients in Lebanon: A Cross-Sectional Study

Zaki Abou Mrad

American University of Beirut Faculty of Medicine

Aram Bidikian

American University of Beirut Faculty of Medicine

Rudy El-Asmar

American University of Beirut Faculty of Medicine

Razan Hallak

American University of Beirut Faculty of Medicine

Dana Khoury

American University of Beirut Faculty of Medicine

Bakhos Tadros

American University of Beirut Faculty of Medicine

Michael Timonian

American University of Beirut Faculty of Medicine

Ahmed A. Mohamed

American University of Beirut Faculty of Health Sciences

Lina Fakh

American University of Beirut Medical Center

Fatima Haidar Bazzoun

American University of Beirut Faculty of Health Sciences <https://orcid.org/0000-0001-6349-662X>

Monique Chaaya (✉ mchaaya@aub.edu.lb)

American University of Beirut <https://orcid.org/0000-0002-2695-8079>

Husam Ghush

Ain Wazein Medical Village

Research Article

Keywords:

Posted Date: January 17th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1166948/v1>

Abstract

Background Studies have shown that dementia caregivers are inclined to sacrifice their well-being leaving them susceptible to an increased risk of anxiety, low quality of life, and depression. With the proportion of female caregivers being unusually high, most studies focused exclusively on the burden of care in female caregivers, resulting in a knowledge gap regarding male caregiver burden. This study aimed to assess the difference in the burden of care experienced by male and female caregivers of dementia patients and the association of burden of care with psychological wellbeing according to gender.

Methods This was a cross-sectional survey of dementia patients' caregivers from various locations in Lebanon, administered over the phone using structured questionnaires from February to April 2019. The population consisted of 50 females and 11 males' informal unpaid caregivers above the age of 18 in daily contact with the patient. The sample was conveniently selected and identified through two main non-profit organizations. The patient and the caregiver's sociodemographic information were recorded. The psychological distress was measured using the General Health Survey Questionnaire (GHQ 12) whereas the burden of care was measured using the Zarit Burden Interview 22 (ZBI 22).

Results A large proportion of caregivers reported a severe level of burden (41 %). Only item 17 of the ZBI questionnaire (Feeling of life loss control since relative's illness) was substantially higher among females. Of the caregivers, 70.5% experienced moderate to severe distress, being significantly higher in females. The sex of caregivers was the only socio-demographic factor significantly associated with the burden of care. Female caregivers who experienced severe burden had significantly higher odds of distress compared to those with no or mild to moderate burden (adjusted OR=15.55). No association among male caregivers.

Conclusion This study demonstrated that female caregivers experience a greater burden compared to males when assessed about anger. This could be explained by the different gender roles imposed by the Lebanese society on its members. Caregivers should be part of the holistic treatment of dementia patients since they represent an essential pillar of the informal care provided.

Introduction

With the increased life expectancy in both developing and developed countries, the world is facing a prolonged increase in the survival of older populations. The World Health Organization (WHO) stated that the global average life expectancy improved by 5.5 years between 2000 and 2016 [1]. Corresponding with prolonged survival, various chronic morbidities that commonly affect the elderly are becoming increasingly prevalent, along with the need for informal care. One of the most prevalent chronic diseases is dementia. It is estimated that approximately 47 million people worldwide had dementia in 2015. These figures will remain on the rise in parallel with an increase in life expectancy, which is predicted to double every 20 years [2].

Dementia is commonly referred to as the 'disease of the elderly' since 97% of dementia patients are classified as late-onset (>65 years) [3]. Dementia is a chronic disorder comprised of a decline in cognitive and behavioral capacities which is associated with disturbances in emotional control, social behavior, or motivation [4]. As the disease progresses, patients become incapable of leading an autonomous life. The diagnosis of dementia entails a burden on multiple levels: the patient him/herself, the caregivers, and the healthcare system [5] [6]. Studies indicate in the case that dementia patients are not provided proper assistance, their quality of life would drop, and their rate of institutionalization would rise [7]. Thus, requiring continuous help will eventually be deemed inevitable. Family members constitute the majority of caregivers of patients living with dementia and they fall under the category of 'informal care' [8]. Studies have shown that caregivers are more prone to sacrifice their well-being and comfort [9] and are thus at an increased risk of anxiety, low quality of life, and depression [6]. A recent scoping review conducted by Kane and colleagues [10] aimed to examine empirical studies concerned with dementia caregiving in the Middle East and North Africa (MENA), reported that due to psychosocial, cultural, and religious belief systems in this region, the responsibility of care for the elderly falls on the shoulders of family members, particularly women. They also found that the burden of caregiving extended beyond psychological burden and on to financial, physical, and emotional wellbeing.

A meta-analysis of differences between caregivers and non-caregivers in psychological health has concluded that the burden of caring for patients living with dementia is higher compared to the burden of caring for patients with other chronic disorders [11]. Previous literature reveals that the higher the cognitive impairment of the patient, the greater the burden of caregiving and the lower the quality of care offered [12]. In support of previous studies, the notion of time brings yet another dimension to the burden of care in dementia patients. They require long-term care which implies that family members will have to deal with this disorder for quite some time. This further increases the physical and mental burden associated with caregiving [13].

Lebanon is a small country located in the Middle East characterized by the highest proportion of elderly among the neighboring countries, expected to reach 26% in 2050 [14]. Most of the elderly in Lebanon are looked after by members of their family and the act of caregiving is viewed as a way of thanking and honoring them [13]. It was shown that in 2013, the crude prevalence of dementia was 7.4%, which translates into approximately 30,000 living with dementia [15]. Earlier studies have shown that the burden of care can be affected by multiple demographic factors. One such factor is the caregiver's sex. In Lebanon, research on caregiver demographics showed that 75% were females and 66% were married [16]. With the proportion of female caregivers being so high, many previous studies focused on the burden of care in female caregivers exclusively and this led to a gap in knowledge about male caregiver burden [13].

There is a shortage of studies that tackle the effect of the burden on the caregiver's quality of life-based on their genders. In a study that assessed the determinants of the burden of care in caregivers of dementia patients, it was found that the overload, patient relationship quality, adverse life events, caregiver sex, caregivers' level of neuroticism, caregiver role captivity, and the level of caregiver confidence, accounted for over 80% of the variance in caregiver burden [17]. However, the caregiver

gender didn't even rank in the top 5 strongest predictors out of these 7 factors [18]. While it was shown on multiple occasions that being a female caregiver predicts an increased risk of burden among caregivers [17], other papers reached different conclusions. Our study aimed to assess the association of the burden of care on caregivers' psychological wellbeing and investigate whether this relationship differs by gender in Lebanon.

Materials And Methods

Study Design and Sample

This was a cross-sectional study of dementia patients' caregivers selected from different locations in Lebanon. The target population included female and male informal caregivers, above the age of 18, not paid, and having daily contact with a dementia patient. A total of 61 caregivers (50 females and 11 males) participated in the study and they were identified either from the community through the study investigators, or the Alzheimer's Association Lebanon - a local NGO whose mission is to improve the quality of life of dementia patients and their caregivers, or from *Ain Wazein Medical Village* a private non-profit – nongovernmental Organization. The caregivers were family members, either direct relatives such as spouse, brother, sister, son and daughter or extended family members such as cousin, nephew, niece, and sibling in law. The study was conducted using a structured questionnaire filled over the phone, from February 2019 till April 2019, inclusive. Investigators contacted potential participants using a uniform text to introduce themselves and read the consent forms. All caregivers contacted consented orally and survey was completed on the phone. A paper copy of the consent forms was available at the two organizations to participants in case they requested it. The study was approved by the Institutional Review Board (IRB) at the American University of Beirut Medical Center (protocol # SBS-2018-0648) and by *Ain Wazein Hospital IRB (Protocol # CRU244)*.

Measurement

Sociodemographic information of caregivers and patients:

Sociodemographic information of the patient such as age, gender, and time since diagnosis as well as sociodemographic characteristics of caregivers (age, gender, education, living with the patient, relationship to the caregiver, marital and employment status) were reported by the caregivers. Age was grouped into 4 categories (less than 41, 41-50 years, 51-60 years, 61 years and above).

Burden of care:

The burden of care was measured using a validated Arabic version of the Zarit Burden Interview, a 22-item questionnaire with responses ranging from '0 – never' to '4-always' [19]. The total score ranging from zero to 88, was categorized into three groups: little or no burden (0-21), mild or moderate burden (21-

40), and moderate to severe burden (41-88) [18]. In this study, the total score was used as a binary exposure measure (0-40 as no to moderate burden; 41 and above as severe).

Psychological distress of caregiver:

The psychological distress of caregivers is the main outcome and was measured using the General Health Survey Questionnaire (GHQ 12) which is a reliable questionnaire validated in Arabic [20] . It is a 12-item questionnaire with a 4-point scale and responses ranging from 'better than usual' to 'much less than usual'. GHQ 12 measures several aspects of health, such as physical performance; role limitations due to physical and emotional health problems; general health; daily energy, and social functioning. A 4-point scale (from 0 to 3) was used to generate a total score ranging from 0 to 36. A Score greater than 11 indicated the presence of moderate to severe psychological distress. The score was thus categorized into two groups :1- no to mild distress (A score between 0-11) and 2- moderate to severe distress (a score greater than 11).

Statistical Analysis:

Data was entered and analyzed using SPSS version 24 and STATA version 13. Descriptive statistics were run for sociodemographic characteristics of caregiver and dementia patients, burden of care, and psychological distress stratified by sex. We checked for potential confounders by examining the association of each covariate with burden of care, the main exposure variables by computing Chi Square tests. Multiple logistic regression analysis was done to investigate the association between burden of care and psychological distress, stratified by sex, and adjusted for potential confounders whose association with burden of care generated a p-value of >0.2. Odds ratios of distress with their 95 % confidence intervals were reported.

Results

Table 1 presents the basic socio-demographic characteristics of the total sample stratified by sex. The ages of the 61 caregivers ranged from 26 years to 75 years with a mean age of 51 ± 11 years. Almost 60% of caregivers were sons or daughters of the patients, 16 % spouses and one-fourth were brothers/sisters, cousins, nieces/nephews, and sons/daughters in law. The highest proportion of caregivers (64 %) were living with the patient and had finished tertiary education/college (67 %). More than half (55 %) of the caregivers had a paid full-time job. In our sample, the caregiver was most commonly a married female with a mean age of 49 years, having had completed university-level education, and employed. The patient cared for was most commonly a female with a mean age of 80, usually the caregiver's mother, and having been diagnosed with dementia for over 5 years.

No differences in the caregivers' or patients' basic sociodemographic characteristics between the male and female caregivers were noted. A high proportion of caregivers reported a moderate to severe burden (77 %) with more than half being severe, with no statistical differences by sex. However, when we examine sex differences for individual items of the Zarit Burden scale, only item 17 (Feeling of life loss control since relative's illness) was significantly higher among

females (supplement table 1). Furthermore, 70.5% of the caregivers experienced moderate to severe distress, being significantly higher among females (table 1).

To assess potential confounders, we cross-tabulated all socio-demographic characteristics of caregivers and patients with the dichotomized burden of care. Other than the sex of the caregiver, none of the patient's or caregivers' socio-demographic characteristics was statistically significantly associated with the burden of care. The unadjusted association of burden of care with distress was statistically significant with an OR of 9.20 (95 % CI of 1.88-44.99). For the final analysis, the age of the patient and that of the caregiver were included in the multiple logistic regression analysis as their p-values were less than 0.2. (**Table 2**). Results revealed that controlling for age of patient and caregiver, female caregivers who experienced severe burden had a significantly higher odds of severe distress compared to those with no or mild to moderate burden, (Adjusted OR = 15.55; 95 % CI 1.63 – 146.56). The association of burden with distress among males was non-significant.

Discussion

The results of this study demonstrate that a substantial proportion of the family caregivers in the study expressed a severe burden of care as a consequence of the care they provide to their relatives living with dementia. A substantial proportion of them were suffering from moderate to severe psychological distress. This is consistent with the available literature which also demonstrated that these levels are much higher than those reported among general community samples or non-caregivers [21] [22] [23]. Contrary to what would be expected based on previous literature [17], the overall burden of care did not differ according to the sex of the caregiver possibly due to the limited sample size. However, when the Zarit Burden Interview (ZBI) items were assessed individually, Item 17 (Factor 3: Anger and Frustration or consequences of caregiving) showed a significant difference where female caregivers demonstrated a higher burden when asked if they felt that they “lost control of their life after the patient’s illness”. This could mean that, when the sample size increases, the difference in burden between males and females could mostly be found under the terms of “anger and frustration”, indicating a difference in how the different sexes emotionally perceive their role as caregivers. Unlike other studies that showed that the higher the cognitive impairment of the patient, the higher the burden of caregiving; the results of this study did not find any association between the cognitive impairment of the patient and the burden of care [12].

Psychological wellbeing was strongly associated with the burden of care for female caregivers. While the goal of this study was to assess the difference in burden experienced by the different sexes of caregivers with its effect on their distress, the numbers sampled did not allow for this relationship to be studied effectively. Furthermore, the estimates had very large confidence intervals which indicates a low precision of estimates. What is definitely consistent is the association of burden to distress among females with very strong associations, with the magnitude of association not being a function of the sample size. The positive association among males was of moderate magnitude, however non-significant, which could also be the result of the very small sample we were able to reach. It is also important to note that most of

the caregivers in the current sample had at least college-level education and many of them had access to resources provided by the Alzheimer's Association Lebanon. Thus, it is expected that they have been more prepared to cope with such a burden than the general population of caregivers. Still almost half of our sample experienced moderate to severe burden and 70% of them experienced distress. Therefore, with a larger, more comprehensive sample, a further rise in these values is expected.

Limitations

The main limitation of this study is the sample size and the inability to recruit an adequate number of male caregivers. The sample size was not powerful enough to detect a significant association between the burden experienced and distress among male caregivers. The small sample size was the result of several obstacles that hindered the data collection. The IRB approval of Ain Wa Zein Medical Village, a major caregiver recruitment center for our study, was obtained late, allowing for the recruitment of only a few participants. Several social organizations were approached for recruitment but were not successful in referring caregivers for interviews. Another limitation to the study is the nature of the sample being a convenient one because of the lack of a sampling frame for the investigators to start with, and the stigma surrounding dementia which does not encourage caregivers to talk about it. Furthermore, due to the cross-sectional nature of the study, temporality between the variables cannot be established. It is very unlikely that distress preceded the burden experienced by the caregiver, but possible. We were also unable to collect data on potential confounders such as the health status of the caregiver and the physical health of the patient. This was mostly due to the interviews being done by phone calls using a short questionnaire, which hindered our ability to collect that information. This could attenuate the relationship between burden and distress, but it is unlikely these variables will act as total confounders especially when the association is strong.

Strengths

The use of validated tools such as the ZBI and the GHQ enhances the internal validity of the study by limiting information bias. The phone interviews conducted possibly reduced the social desirability bias that could have swayed the results.

Conclusion

This study confirms the effect of the burden on the caregiver's quality of life and the need to include informal caregivers in the treatment of dementia patients to better assist and improve assistance and the caregivers and patients' quality of life. We propose creating a supportive social network that brings together dementia caregivers and allows them to share their experiences and provide mutual support. Caregivers should be part of a support system to improve their coping skills, reduce their stress, and decrease the burden.

In the Lebanese culture, girls are raised on traditional values and customary beliefs that prepare them to be caregivers and individuals who must shoulder the responsibility of their family members, be it their

children, parents, and/or siblings. In addition to those responsibilities, women in Lebanese society must also manage their personal lives. In contrast, boys are raised more freely and are encouraged to be more independent, with traditions maintaining the impression that males are supposed to be the stronger figures, while females are supposed to be the subordinate figures. The effects of such upbringing might interfere with how males and females perceive emotional and physical burdens when they are bestowed with the caregiver role.

In this present study, we aimed to assess the differences in burden experienced by male and female family caregivers of dementia patients. Although our sample size was not large enough to clearly demonstrate the major discrepancies, some differences were noted between the two genders. The clearest difference was highlighted by the Zarit Burden Interview (ZBI) item 17 that falls under factor III on “anger and frustration”. Female caregivers experienced more burden than their male counterparts when asked about the loss of control over their life, and as the sample size grows with further data collection, more differences may be elaborated in terms of the burden experienced generally and “anger and frustration” specifically. These differences can potentially be explained by the different gender roles that the Lebanese society imposes on its members. Given that and the fact that caregivers represent an essential pillar in the care provided to dementia patients, they should be considered as part of the holistic treatment of dementia. Although not directly related to the study, but the difficulty we encountered in recruiting a caregiver of a dementia patient indicates the need for a national registry in Lebanon. A dementia registry in Lebanon could have facilitated and secured access to caregivers and enhanced the assessment of their needs and burden. Dementia registries have been proven to benefit research and surveillance and provide data for long-term planning of social and health-related resource allocation. They also provide a full scope of data on the effectiveness of treatment and management, monitor the quality of diagnosis and care, and lower fiscal costs [24].

Declarations

Ethics approval and consent to participate

The study was approved by the Institutional Review Board (IRB) at the American University of Beirut Medical Center (protocol # SBS-2018-0648) and by Ain Wazein Hospital IRB (Protocol # CRU244). All participants were consented on the phone.

Consent for publication

Not applicable

Availability of data and materials

All data generated or analyzed during this study are included in this published article (and its supplementary information files).

Competing interests

None to declare

Funding

No funding

Acknowledgement

Not applicable

Authors' contributions

Zaki Abou Mrad^{1‡}, Aram Bidikian^{1‡}, Rudy El-Asmar^{1‡}, Razan Hallak^{1‡}, Dana Khoury^{1‡}, Bakhos Tadros^{1‡}, Michael Timonian^{1‡}, contributed to conceptualization of the study, data collection, analysis and writing the first draft and approved the final one

Ahmad Mohamad was involved in data analysis, write up of the draft manuscript and approved the final draft

Lina Fakhri contributed to data collection and write up of manuscript and approved final draft.

Husam Ghosn contributed to conceptualization, facilitated data collection and approved final draft.

Monique Chaaya contributed to conceptualization of the study, analysis and writing the manuscript.

Fatima Bazzoun contributed did major editing of the first draft and write up of some parts of the paper and approved final draft

References

1. "Life expectancy," 15 May 2018. [Online]. Available: <https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-life-expectancy-and-healthy-life-expectancy>.
2. M. W. A. G. M. A. G. W. Y. P. M. Prince, "World Alzheimer Report," 21 September 2015. [Online]. Available: <https://www.alzint.org/resource/world-alzheimer-report-2015/>.
3. E. L. Cunningham, B. McGuinness, B. Herron and A. P. Passmore, "Dementia," The Ulster Medical Journal, vol. 84, no. 2, pp. 79-87, 2015.
4. H. Al Sinawi, T. Qassem and A. Al Harrasi, "Dementia in the Arab World," in Handbook of Healthcare in the Arab World, Cham, Springer International Publisher, 2020, pp. 1-14.
5. J. Hugo and M. Ganguli, "Dementia and cognitive impairment: epidemiology, diagnosis, and treatment," Clinics in Geriatric Medicine, vol. 30, no. 3, pp. 421-442, 2014.
6. N. Karg, E. Graessel, O. Randzio and A. Pendergrass, "Dementia as a predictor of care-related quality of life in informal caregivers: a cross-sectional study to investigate differences in health-related

- outcomes between dementia and non-dementia caregivers," *BMC Geriatrics*, vol. 18, no. 1, p. 189, 23 08 2018.
7. H. Brodaty and M. Donkin, "Family caregivers of people with dementia," *Dialogues in clinical neuroscience*, vol. 11, no. 2, pp. 217-228, 2009.
 8. W. H. Organization, "Dementia: a public health priority," World Health Organization and Alzheimer's Disease International, 24 August 2012. [Online]. Available: <https://www.who.int/publications-detail-redirect/dementia-a-public-health-priority>. [Accessed 01 July 2016].
 9. G. Tremont, "Family Caregiving in Dementia," *Medicine and Health Rhode Island*, vol. 94, no. 2, pp. 36-8, 2011.
 10. T. Kane, S. H. Hammad, N. Islam, N. Al-Wattary, J. Clark and S. Daher-Nashif, "Dementia caregiving in the Middle East and North Africa: A scoping review," *Transcultural Psychiatry*, vol. 0, no. 0, pp. 1-15, 19 08 2021.
 11. M. Pinquart and S. Sörensen, "Differences between caregivers and noncaregivers in psychological health and physical health: a meta-analysis," *Psychol Aging*, vol. 18, no. 2, pp. 250-67, 2003.
 12. A. Morlett Paredes, P. B. Perrin, S. V. Peralta, M. E. Stolfi, E. Morelli and J. C. Arango-Lasprilla, "Structural equation model linking dementia cognitive functioning, caregiver mental health, burden, and quality of informal care in Argentina," *Dementia*, vol. 16, no. 6, pp. 766-779, 20 11 2015.
 13. J. Séoud, C. Nehmé, R. Atallah, C. Zablit, J. Yérétzian, L. Lévesque, F. Giroux and F. Ducharme, "The health of family caregivers of older impaired persons in Lebanon: An interview survey," *International Journal of Nursing Studies*, vol. 44, no. 2, pp. 259-272, 30 May 2007.
 14. B. Mirkin, "Population levels, trends and policies in the Arab region: Challenges and opportunities: UNDP in the arab states," United Nations Development Programme, 13 February 2013. [Online]. Available: https://www.arabstates.undp.org/content/rbas/en/home/library/huma_development/population-levels-trends-and-policies-in-the-arab-region-chall.html. [Accessed 25 09 2021].
 15. L. Gallicchio, N. Siddiqi, P. Langenberg and M. Baumgarten, "Gender differences in burden and depression among informal caregivers of demented elders in the community," *International Journal of Geriatric Psychiatry*, vol. 17, no. 2, pp. 154-163, 2002.
 16. K. Phung, M. Chaaya, S. Atweh, K. El Asmar, G. Karam, R. Khoury, L. Ghandour, H. Ghusn, S. Assaad, M. Prince and G. Waldermar, "Dementia and family burden of care in Lebanon," *BJPsych. International*, vol. 14, no. 1, pp. 7-9, 02 2017.
 17. P. Campbell, J. Wright, J. Oyeboode, D. Job, P. Crome, P. Bentham, L. Jones and C. Lendon, "Determinants of burden in those who care for someone with dementia," *International Journal of Geriatric Psychiatry*, vol. 23, no. 10, pp. 1078-1085, 2008.
 18. B. Stagg and A. J. Larner, "Zarit Burden Interview: pragmatic study in a dedicated cognitive function clinic," *Progress in Neurology And Psychiatry*, vol. 19, no. 4, pp. 23-27, 2015.
 19. Y. G. Bachner, "Preliminary assessment of the psychometric properties of the abridged Arabic version of the Zarit Burden Interview among caregivers of cancer patients," *European Journal of Oncology*

- Nursing, vol. 17, no. 5, pp. 657-660, 10 2013.
20. A. Alhamad and A. E. Al-Faris, "THE VALIDATION OF THE GENERAL HEALTH QUESTIONNAIRE (GHQ-28) IN A PRIMARY CARE SETTING IN SAUDI ARABIA," *Journal Of Family and Community Medicine*, vol. 5, no. 1, pp. 13-19, 5 January 1998.
 21. E. E. Udoh, D. E. Omorere, O. Sunday, O. S. Osasu and B. A. Amoo, "Psychological distress and burden of care among family caregivers of patients with mental illness in a neuropsychiatric outpatient clinic in Nigeria," *PLoS ONE*, vol. 16, no. 5, 2021.
 22. E. Berglund, P. Lytsy and R. Westerling, "Health and wellbeing in informal caregivers and non-caregivers: a comparative cross-sectional study of the Swedish general population," *Health and Quality of Life Outcomes*, vol. 13, no. 109, 2015.
 23. A. M. POT, D. J. DEEG and R. VAN DYCK, "Psychological well-being of informal caregivers of elderly people with dementia: Changes over time," *Aging & Mental Health*, vol. 1, no. 3, pp. 261-268, 1997.
 24. K. Kryszynska, P. S. Sachdev, J. Breitner, M. Kivipelto, W. Kukull and H. Brodaty, "Dementia in registries around the globe and their applications: A systematic review," *Alzheimers Dement.*, vol. 13, no. 9, pp. 1031-1047, 2017.
 25. K. T. Phung, M. Chaaya, M. Prince, S. Atweh, K. El Asmar, G. Karam, R. M. Khoury, L. Ghandour, H. Ghushn, T. R. Nielsen and G. Waldemar, "Dementia prevalence, care arrangement, and access to care in Lebanon: A pilot study," *Alzheimer's & Dementia*, vol. 13, no. 12, pp. 1317-1326, 06 2017.
 26. W. Gunhild and M. Chaaya, "Prevalence of Dementia in Lebanon: A Nationwide Community-Based Cohort Study," *Grantome*, 01 September 2011. [Online]. Available: <https://grantome.com/grant/NIH/R21-AG039333-01>. [Accessed 29 September 2021].
 27. "Psychological distress and burden of care among family caregivers of patients with mental illness in a neuropsychiatric outpatient clinic in Nigeria," *PLoS ONE*, 2021.

Tables

Table 1 percent distribution of caregivers by selected sociodemographic characteristics, burden, and psychological wellbeing, stratified by sex.

Characteristics	Total number N = 61	Male N = 11	Female N = 50	P value
1. Socio demographics				
Age				
Less than 41	13 (21.7%)	1 (9.1%)	12 (24.5%)	0.589
41 to 50	15 (25%)	3 (27.3%)	12 (24.5%)	
51 to 60	22 (36.7%)	4 (36.4%)	18 (36.7%)	
61 and above	10 (16.6%)	3 (27.3%)	7 (14.3%)	
Education				
Secondary or lower	20 (32.8%)	5 (45.5%)	15 (30%)	0.323
Tertiary	41 (67.2%)	6 (54.5%)	35 (70%)	
Live with patient				
Yes	39 (63.9%)	7 (63.6%)	32 (64%)	0.982
No	22 (39.1%)	4 (36.4%)	18 (36%)	
Marital Status				
Not married	17 (27.9%)	5 (45.5%)	12 (24%)	0.151
Married	44 (72.1%)	6 (54.5%)	38 (76%)	
Employment				
Employed	34 (55.7%)	9 (81.8%)	25 (50%)	0.054
Unemployed	27 (44.3%)	2 (18.2%)	25 (50%)	
Relation to patient				
Spouse	10 (16.4%)	2 (18.2%)	8 (16%)	0.861
Son/Daughter	36 (59%)	7 (63.6%)	29 (58%)	
In-laws or other	15 (24.6%)	2 (18.2%)	13 (26%)	
Impact of stressful life event				
No to slight				0.307
Moderate to severe	36 (59%)	8 (72.7%)	28 (56%)	
	25 (41%)	3 (27.3%)	22 (44%)	

2. <i>Burden of care</i>				
<i>Mild</i>	14 (23%)	3 (27.3%)	11 (22%)	0.591
<i>Moderate</i>	22 (36%)	5 (45.4%)	17 (34%)	
<i>Severe</i>	25 (41%)	3 (27.3%)	22 (44%)	
3. <i>Psychological wellbeing</i>				
<i>Mild</i>	18 (29.5%)	6 (54.5%)	12 (24%)	0.044*
<i>Moderate to severe</i>	43 (70.5%)	5 (45.5%)	38 (76%)	

Table 2. Multiple Logistic regression analysis showing an adjusted association between the level of burden and psychological wellbeing experienced by the caregiver, stratified by sex (unadjusted OR = 9.20, 95% CI 1.88-44.99)

		<i>The burden of care (mild to moderate)</i>	<i>Adjusted OR#</i>	<i>95% C.I. for EXP(B)</i>		
<i>Sex</i>			<i>P value</i>	<i>Lower</i>	<i>Upper</i>	
<i>Female</i>	<i>severe</i>		<i>15.55</i>	<i>0.017*</i>	<i>1.63</i>	<i>146.56</i>
<i>Male</i>	<i>severe</i>		<i>1.787</i>	<i>0.714</i>	<i>0.08</i>	<i>40.02</i>

#Adjusted for the age of patient and caregiver

*statistically significant p-value <0.05

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [supplementaltables.docx](#)