

Caregiver burden among family members of patients diagnosed with cancer in Jimma medical center oncology unit, south west Ethiopia.

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Research Article

Keywords: Cancer, Caregiver Burden, Ethiopia

Posted Date: January 5th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1225187/v1>

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Abstract

Background

Cancer is a type of disease defined by uncontrolled growth and spread of abnormal cells, which can result in death. Globally, around 25 million people are surviving with it. The burden of cancer is growing in developing countries and it frequently comprises patient's vitality. In addition, it has emotional, economical, physical and psychological burden on family, friends, significant others, community and other social resource.

Objective

To assess caregiver burden of cancer patients in Jimma medical center oncology unit, South west Ethiopia.

Method

An institutional based cross-sectional study design was employed. The study was done on 141 respondents using simple random sampling. A pretested semi structured interviewer administered questionnaire was used to collect the data. The collected data was entered in to EPI data version 3.1 then transferred to SPSS version 23 for data analysis. Multivariable logistic regression model was fitted, Adjusted Odds Ratio (AOR) at 95% confidence interval and p-value <0.05 were estimated to determine statistically association between predictors and outcome variables.

Results

The data were collected from the total of 141 respondents with 100% response rate. The mean \pm SD age of cancer patients and care givers were 46.4 ± 12.406 and 32 ± 11.23 years, respectively. The general level of caregiver burden in this study was mild to moderate (71.6%) with ZBI total score of 30 and by using CBI114 (80.9%) had some burden. Caregivers whose their age is greater than 40 years were 4.01 times more likely have high burden than those age between 20-40 old age [AOR=4.01, 95%CI (1.58, 10.17)].

Conclusion

The study disclosed a moderate level of caregiver burden among family caregivers.

Background

Cancer is a type of disease in which several of the body's cells change uncontrollably and are distributed to other parts of the body [1]. Globally, cancer is a leading public health problem and a major cause of death. Lung and breast cancer are the most often diagnosed and leading causes of cancer death in men and women, respectively [2].

In most cases, cancer care requires long-term medical attention and support. Many patients who are long-suffering by cancer depend on family and friends to help with cancer care needs, and their family members frequently take the primary responsibility as the caregiver [3]. Due to the disconcerting nature of the illness, being a caregiver for a family member with cancer requires varied tasks which are physically, emotionally, socially, and financially demanding [4, 5].

Care-giving activities include monitoring symptoms, dealing with different side effects, following medical info, and providing emotional and clinical support [1, 6]. Day-to-day activities are also negatively impacted and as a result numerous caregivers become isolated from other people [7, 8]. In addition, the caregiver's activities influence the coping style of the patient with cancer such as managing depression that can arise from the ordeal of surviving with cancer [9, 10]. Unluckily, negative emotions such as anxiety, depression, and symptoms of post-traumatic stress can be stressful for patients and ultimately impact both patients' and caregivers' health [11].

Family caregivers want preparation to face the supply of their new roles and responsibilities like physical, psychological, spiritual, and social support [12]. In the home family caregivers are anticipated to give complex and dimensional care with little preparation or support. When the need of the care-giving roles is greater than the caregivers' limited resources, they feel overwhelmed and report high stress which leads to much caregiver burden [13].

Globally, cancer is the second leading cause of death, which accounts for 9.6 million deaths in 2018, and 1 in 6 deaths is due to cancer and about 25 million people are surviving with cancer. Each year, 7 million people die from cancer and 11 million new cases are diagnosed globally. In fact, more people die from cancer than from AIDS, malaria, and tuberculosis. Out of all deaths, each year 12.5% of deaths are due to cancer worldwide. The bad news is that the incidence of cancer in developing countries like Ethiopia is rising at an alarming rate while it is decreasing in developed countries [14]. As hospital records in Ethiopia showed, there are more than 150,000 cancer cases annually and presently cancer accounts for 4% of all deaths. Nevertheless, in Ethiopia cancer is the most ignored and least prioritized health issue. In Ethiopia, the number of new cancer cases is expected to rise by 70% over the next 2 decades [14].

In Ethiopia, cancer accounts for about 7.98% of total national mortality. According to population-based data in Ethiopia, the annual incidence and mortality of cancer is around 67,573 cases and over 47,954, respectively. For people under the age of 75 years, the risk of being diagnosed and dying with cancer is 10.2% and 80%, respectively. Among the adult population in Ethiopia, the most prevailing cancers are breast cancer (22.6%), cancer of the cervix (9.3%) and colorectal cancer (7%). About two-thirds of reported annual cancer deaths occur among women [15].

Cancer affects not only those people who suffering from the disease but also those who give care for them. The informal caregivers accomplish many tasks that should be performed by health professionals in the health facilities. The caregivers develop psychological worries, increasing rate of physiological illness, and social problems due to lack of help while they give care for the cancer patients [16].

Informal caregivers of patients with cancer are vulnerable to all kinds of psychological (anxiety, stress, depression) and physical (burn-out, increased mortality, loss of weight, poor immune functioning, and insomnia) burdens [17]. However, in sub-Saharan Africa particularly in Ethiopia, little is known about problem facing the informal caregivers of cancer patients [18].

When the demands exceed their resources, caregivers feel overwhelmed and report high stress which has a negative outcome initially on the caregiver's psychological well being and also physical well-being as the stress continued [19]. Caregivers of cancer patients pass through certain social, financial, and psychological problem at the time they give care [20]. During their intense and unpredictable courses, the caregiver's burden is complex and complicated by multiple competitive priorities. Since caregivers are frequently faced with multiple concurrent stressful events and extended, unrelenting stress, they may experience negative health effects, mediated in part by immune and autonomic dysregulation. Therefore, caregivers become vulnerable to physiological and psychological health problems [21].

Since the caregivers' energy and time focused on the patients' recovery, care-giving interrupt social contentedness and activities, which resulted in social separation and solitariness, changes in family and other human relationship, a sense of sorrow and loss, and constricted time for personal relationships [22]. Care-giving for cancer patients also creates a financial burden for family members, both in outright expenses and in lost income and benefits [23].

Even though studies in developed countries focused on caregiver's health perspectives, there is paucity of the same in developing countries. Different research studies have shown the relationship of burden of caregiver with age, gender, relationship to the patient, unemployment, income of the caregivers, lack of family and social support, duration and stage of disease, previous care experience, and care for another sick patient [24, 25]

Methods

Study Area and period

This study was employed in Jimma medical center (JMC) which is located in Jimma zone, Oromia region, South west of Ethiopia. It is 350km far from Addis Ababa, the capital city of the country. JMC is one of the oldest and only teaching and referral hospital in southwest of Ethiopia with 800 bed capacity and over 15 million people catchment population [26].

JMC is accompanied with various units such as dental clinic, dermatology clinic, laboratory unit, pathology unit, psychiatry clinic, ENT clinic, physiotherapy unit, surgical unit (general surgery,

neurosurgery, orthopedics, urology, and plastic surgery), internal medicine with sub-specialty of cardiology and neurology, ophthalmology, radiology, oncology, gynecology & obstetrics and pediatrics to serve the community. The study was employed from July 20 to August 20, 2021.

Study design

To conduct this study an institutional based cross sectional study design was employed.

Population

Source population

The source populations of the study were all family caregivers of diagnosed cancer patients who were attending JMC oncology unit.

The study population

The study populations were all sampled family members of patients diagnosed with cancer and who were on treatment/ follow-up/ care in JMC oncology unit.

Inclusion and Exclusion criteria

Inclusion criteria

All Family caregiver of cancer patient who had treatment / care follow-up in JMC oncology unit during study period and willing to participate were included.

Exclusion criteria

All family caregivers of cancer patients who were not willing to give information, age < 18 years, and with severe functional or cognitive impairment were excluded.

Sample size determination and sampling technique

Sample size determination

Single population proportion formula was used to determine sample size by considering the Prevalence of family caregiver burden 50%, desired degree of precision of - 5 % and $Z_{\alpha/2}$ is the value of the standard normal distribution corresponding to a significant level of alpha (α) of 0.05, which is 1.96 and sample size was 384. Since the source population was < 10,000, the reduction formula was used to get the new sample size 192, then by adding 10% for non-response rate, the final sample size for the study was 141.

Sampling technique

First, Jimma medical center (JMC) was selected based on the availability of cancer care service. Then, lists of cancer patients who had treatment/follow-up were identified from registration book of JMC oncology unit. Finally, the respondents were selected by simple random sampling technique. Boxes containing papers with codes 0 and 1 was used for the care takers to pick the papers at random without replacement and the care takers who pick 0 was not participate in the study and the one who pick 1 was participated in the study and this was given each respondent an equal chance of being selected without bias.

Study Variables

Dependent variable

Care giver burden (Physical, psychological, emotional, economic and social)

Independent variable

- Socio-demographic factors of caregivers of cancer patients such as age, sex, educational status, marital status, monthly income, patient-caregiver relationship type, number of members in family, number of financial dependent people, occupational status, availability of other support.
- Socio-demographic factors of cancer patients: age, sex, educational status, Residential place, marital status, monthly income, occupational status, Patient's independent level, types of cancer, duration of disease (acute/chronic) since diagnosed, duration of treatment modalities, payment for medical service, stage of cancer, co-morbidity, health-related quality of life such as physical, psychological, emotional, and social well-being.
- Care related factors: place of care, caring time, types of care and duration of care.

Data collection tools

A pretested semi-structured interviewer administered questionnaire was formulated from different literature & modified in to the study context. The questionnaire contained closed-ended and open-ended questions that was used to assess socio-demographic and economic characteristics of care givers of cancer patients. An outcome variable (presence of caregiver burden) was collected which defines

caregiver burden by physical, psychological, social and financial response that might emerge while providing care. Zarit Burden Interview (ZBI) which has 22 items was used to measure the level of care giver burden. The items were defined subjectively and focused on the emotional response of caregivers. Each question is scored on a 5-point scale ranging from never to nearly always present. Total scores range from 0 (low burden) to 88 (high burden). If ZBI total score of <21, 21 to 40, 41 to 60 and > 61 indicates little or no, mild to moderate, moderate to severe and severe burden, respectively [27].

Additionally, Caregiver Burden Inventory (CBI) which consists of 24 items Likert-format scale for which the responses are scored on a five-point (0–4) was also used to measure five dimensions of burden. These dimensions include developmental (describe the caregivers' impression of being left behind, unable to enjoy similar anticipation and possibilities with regard to their peers), time dependency (burden on caregiver due to limited time), physical (impression of chronic tiredness and physical health related problems), social (which describe caregivers' sense of perceived conflict roles), and emotional burden (caregivers' antagonistic feelings toward their patient, which can be evoked by the patient's eccentric and episodic behaviour).

The total score ranges from 0 to 96 and score > 36 shows a danger of “severe burden” and scores near or slightly above 24 show a necessity to desire some form of reprieve care. The internal consistency coefficient for this tool ranged from 0.92 to 0.94 [28]. The Cronbach’s alpha coefficient of this study was 0.88.

Data collection procedure

Semi-structured interviewer administered questionnaire was used to collect the data by four trained data collectors. Data was collected from respondents after informing the purpose of the study and how to fill the questioner by face to face. Continuous follow-up and supervision was made by Principal Investigator (PI) during the data collection period.

Data quality control Assurance

First data was prepared in English and translated to Amharic then re-translated back to English by expert of languages to maintain data consistency. Pretest was made in 10% of sample size in other health facility that have similar service.

Data processes and analysis

The collected data was emended, coded and entered in to Epidata version 3.1 then transferred to SPSS version 23. Farther data cleaning such as editing, recording, checking for missing values, and outliers were done. Data analysis includes basic description and identification of possible indicators of care burdens of families of cancer patient. Multivariable logistic regression model was fitted, Adjusted Odds Ratio (AOR) at 95% confidence interval and p-value <0.05 were estimated to determine statistically association between predictors and outcome variables. Descriptive statistics was computed to

summarize the data. The result of this study was presented using frequencies, proportions, figures and tables.

Ethical Consideration

Ethical clearance was obtained from Jimma University school of Nursing. prior to data collection, letter of permission was locked from Jimma medical center administrator, and informed consent was obtained from respondents after the purpose of the study was explained to them. The personal identities like name of the respondents, confidentiality of the information they gave and privacy of the respondent were maintained.

Results

5.1 Socio-demographic characteristic of the study participant

The data were collected from the total of 141 respondents with 100% response rate. The mean \pm SD age of cancer patients was 46.4 ± 12.406 old age. Among all cancer patients, majority 73 (51.0%), 86 (61%) and 99 (70.2%) of them were in age group of 41-60 years, female, and married in their marital status, respectively. Regarding care giver of the patient, the mean \pm SD age of caregiver was 32 ± 11.23 years and the major age range was 20-40. Majority of caregivers 77 (54.6%), 84 (59.6%) and 58 (41.2%) of them were female, married and able to read and write, respectively (Table 1).

Table 1: Socio-demographic characteristics of cancer patients and caregivers at JMC, south west Ethiopia, 2021 (n=141)

Variables	Description	Frequency (n)	Percentage (%)
Patient Age	20 – 40 year	51	36.2 %
	41 – 60 year	73	51. %
	≥ 60 years	17	12.1%
Patient Sex	Male	55	39 %
	Female	86	61 %
Patient Marital status	Married	99	70. 2%
	Single	26	18. 4%
	Divorced	8	5.7 %
	Widowed	8	5.7 %
Caregiver age	20 – 40 years	110	78 %
	41 – 60 years	28	19. 9%
	>60 years	3	2.1 %
Caregiver sex	Male	64	45.4 %
	Female	77	54.6 %
Caregiver marital status	Married	84	59.6 %
	Single	54	38.3 %
	Divorced	2	1.4 %
	Widowed	1	0.7 %
Caregiver educational status	Read and write	58	41.2%
	Unable to read and write	83	58.8%
Caregiver employment status	Housewife	10	7.1 %
	Farmer	42	29.8 %
	Governmental employee	8	5.7 %
	Student	38	27.0 %
	Daily labor	10	7.1 %
	Merchant	29	20.6 %
	Other**	4	2.8 %
Family income	<3000 EBR	19	13.5 %

3001-7000 EBR	78	55.3 %
7001-10,000 EBR	32	22.7%
>10,000EBR	12	8.5 %

5.2. Health related characteristics

Among patients diagnosed with cancer, majority 93 (66%) of them were known with stage III cancer. Regarding the duration of illness and number of hospitalization, the majority 103 (73.1%) and 99 (71.2%) of patients were stayed with cancer for greater than 6 month duration and had at least one and at most 3 times previous hospitalization, respectively.

Concerning the care giving situation of the caregiver, 54 (38.3%) and 61 (41.3%) were giving care for 5-8 / 8 or more hours per day, and 6 months and above duration (Table 2).

Table 2: Health related characteristics of cancer patients and caregivers at JMC, southwest Ethiopia, 2021 (n = 141)

Variables	Description	Frequency (n)	Percentage
Duration of illness	1 month	6	4.3 %
	1-3 month	18	12.8 %
	3-6 month	14	9.9 %
	6 month-1 year	61	43.3 %
	1year and more	42	29.8%
Number of previous hospitalization	No	42	29.8 %
	1	49	34.8 %
	2	22	15.6 %
	3 or more	28	19.9 %
Stage of cancer	stage I	17	12.1 %
	stage II	27	19.1 %
	stage III	93	66.0 %
	stage IV	4	2.8 %
Number of Co-morbidity	No	97	68.8 %
	1	34	24.1 %
	2	9	6.4 %
	3 or more	1	0.7 %
Caregiver relation to patient	Husband or Wife	27	19.1 %
	Children	66	46.8 %
	Other relatives	48	34.0 %
Caregiver co-residence with patient	Yes	112	79.4 %
	No	29	20.6 %
Duration of care giving	1 month	7	5.0 %
	1-3 month	7	5.0 %
	3-6 month	29	20.6 %
	6 month-1 year	61	43.3 %
	1year and more	37	26.2 %
Duration of care giving per day	1hour and less	3	2.1 %

1-3 hour	7	5.0 %
3-5 hour	23	16.3 %
5-8 hour	54	38.3 %
8 or more	54	38.3 %

5.3. Care giver burden

Regarding the level of the care giver burden, 101 (71.6%), 25 (17.7%) and 15 (10.6%) of them had mild to moderate, little to no burden and moderate to severe burden, respectively (Figure 1).

Regarding the overall care giver burden based on computed mean score of ZBI, less than half 69 (48.9%) and majority 72 (51.1%) of the respondents had low and high caregiver burden, respectively. The mean \pm SD score of CBI was 28 ± 10.2 . In line with this majority, 114 (80.9%) them had some burden / seek some form of care service (Figure 2).

Similarly, to determine mean score of the level of CBI; time dependency, developmental, emotional, social and physical burdens were used. More than half, 78 (55.3%) of the family had high physical burden (Figure 3).

Associated factors of Caregivers burdens among Cancer Patients who had treatment follow-up at JMC

During the bi-variate logistic regression analysis, patient sex, patient educational status, hospitalization, duration of illness, and caregivers age, caregiver relation to patient were the associated factor of caregiver burdens among cancer patients.

On the multivariate logistic regression analysis caregivers age, caregiver sex and relation to patient were significant. Caregivers whose their age is greater than 40 years were 4.01 times more likely have high burden than those age between 20-40 old age [AOR=4.01, 95%CI (1.58, 10.17)]. Female caregivers were 4.14 times more likely to have high burden than male caregivers [AOR=4.14, 95% CI (1.46, 11.78)], and those whose relation is husband or wife to patient were 3.23 times more likely to have high burden than those whose relation to patient with child [AOR=3.23, 95%CI (1.76,16.85)] and then other relatives [AOR=3.23, 95%CI (1.22, 8.52)] (Table 3).

Table 3: Associated factors of caregiver burden among cancer patient who had treatment follow up at JMC, south west Ethiopia,2021 (n=141)

Variables	Category	Care-giver burden level		COR (95%CI)	AOR (95%CI)	PV
		Low	High			
Patient age	20 – 40 years	14	97	1	1	
	> 40 years	11	19	4.01(1.58, 10.17)	4.01(1.5.8, 10.17)*	0.003
Care giver Sex	Male	5	59	1	1	
	Female	20	57	4.14(1.46, 11.78)	4.74(1.59, 14.14)*	0.005
Care giver Relation to patient	Husband or Wife	5	22	1	1	
	Child	6	60	1.81(0.57, 5.74)	3.23(1.76,16.85)*	0.003
	Other Relative	14	34	4.11(1.45, 11.71)	3.23(1.22, 8.52)*	0.018

NB- *p,<0.05, significant

Discussion

Providing care by family caregiver for ill patient is usual norm in Ethiopia. But caregivers face caregiver burden in physical, psychological, social, financial reaction while providing care.

This study showed that the majority of caregivers 101(71.6%) had a mild to moderate level of burden. The mean score of burden among the caregivers of cancer patients was 30.22±9.44 which is lower than the finding of other studies done in morocco (34.16±16.39), Nigeria(37.1±12), Iran (36.92) through using Zarit Burden Interview Scale (ZBI score) assessment. But it is higher than the study conducted n Taiwanese medical center (56.0%). These gap might be due to differences in sampling technique, sociocultural status and economic status of study respondents.

And also by using CBI scale the mean score of caregiver burden was 28, with each sub-scale of CBI score; time dependency burden 8, physical burden 6, social burden 5, developmental burden 5, emotional burden 2, which is lower than a study conducted in Iran with mean score burden of 36.92, each sub scale of CBI was developmental 11.64, time 9.49, physical 7.89, emotional 6.02, social 3. These differences may be due to coping mechanism and socioeconomic status of respondents.

LIMITATION AND STRENGTH OF HE STUDY

The study has been focused on marginalized and neglected group of people who were adequate information and studies are lacking.

As the study is institutional based, respondents may not represent all of the care givers of cancer patients in the region. Use of self-reported information may be subjected to reporting errors and biases.

SIGNIFICANCE OF THE STUDY

The result of this study has importance for practitioner, educators, policy makers, and researchers. It also will help to generate ideas for reducing load from care givers of cancer patients.

Conclusion

The data were collected from the total of 141 respondents with 100% response rate. The mean \pm SD age of cancer patients and care givers were 46.4 ± 12.406 and 32 ± 11.23 years, respectively. Among patients diagnosed with cancer, majority 93 (66%) of them were known with stage III cancer. Regarding the level of the care giver burden, 101 (71.6%), 25 (17.7%) and 15 (10.6%) of them had mild to moderate, little to no burden and moderate to severe burden, respectively. Regarding the overall care giver burden based on computed mean score of ZBI, less than half 69 (48.9%) and majority 72 (51.1%) of the respondents had low and high caregiver burden, respectively. The mean \pm SD score of CBI was 28 ± 10.2 . In line with this majority, 114 (80.9%) them had some burden / seek some form of care service. Caregivers age, caregiver sex and relation to patient were significant.

In this study most of the respondents were adult and they suffer a higher caregiver burden due to conflicts between their care giving tasks, careers, and nuclear families.

Declarations

ACKNOWLEDGEMENT

First of all, we would like to thank our God Almighty for giving us healthy and great help during all the period of this study. Our heartfelt appreciations is also directed to Jimma University, Jimma medical center oncology unit nurses for giving us information needed for work of this paper. Finally, we would also like to give thanks our respondents for their interest and cooperation to participate in this study.

AUTHOR CONTRIBUTIONS

BD, MG and DT had been participating in the study by contributing to conception and design of the study, data collection and data analysis, interpretation of data, drafting and critically reviewing the manuscript. Similarly BD had been participating in preparing and reviewing the manuscript. All these authors read and approved the final manuscript.

CONFLICTS OF INTEREST

Regarding this paper, there is no conflict of interest among the authors.

References

1. Education given to, Aburn G, Gott M (2011) parents of children newly diagnosed with acute lymphoblastic leukemia: a narrative review. *J Pediatr Oncol Nurs* pp. 28:300–305
2. World Health Organization (2018) 12 September 2018 retrieved 2018. December 19,
3. Caring for caregivers and patients: Research and clinical priorities for informal cancer caregiving, Kent EE, Rowland JH, Northouse L et al (2016) *Cancer*, pp. 122:1987-1995
4. A labor of love, Ross A, Sundaramurthi T, Bevans M (2013) the influence of cancer caregiving on health behaviors. *Cancer Nurs* pp. 36:474–483
5. Burden, Nightingale CL, Curbow BA, Wingard JR et al (2016). *Chronic Illness*, pp. 12:236-245
6. Spouses' experience, Li QP, Mak YW, Loke AY (2013) of caregiving for cancer patients: a literature review. *Int Nurs Rev* pp. 60:178–187
7. The impact of caregiving on the psychological well-being of family caregivers and cancer patients, Northouse LL, Katapodi MC, Schafenacker AM et al (2012). *Semin Oncol Nurs.*, pp. 28:236–245
8. Understanding the experience of caregivers: a focus on transitions. Blum K, Sherman DW (2010) *Semin Oncol Nurs*, pp. 26:243-258
9. How are spousal depressed mood, distress, and quality of life associated with risk of depressed mood in cancer survivors? Longitudinal findings from a national sample.. Litzelman K, Yabroff KR (2015). *Cancer Epidemiol Biomarkers Prev.*, pp. 24:969-977
10. Cancer care giving, Kim Y, Carver CS, Shaffer KM et al (2015) predicts physical impairments: roles of earlier caregiving stress and being a spousal caregiver. *Cancer* pp. 121:302–310
11. Effectiveness of family and caregiver interventions on patient outcomes in adults with cancer: a systematic review, Griffin JM, Meis LA, MacDonald R et al (2014). *J Gen Intern Med* Ly Nguyen Thuy and Trang Ta Ngoc Dan. 2015
12. Nursing role implications for family caregiving of cancer patients. *semin oncol nurs*, Grant M, Frel B (2012).
13. The impact of care giving on the (2012) psychological well being of family caregivers and cancer patient *semin oncol nurs*; Katopodi MC, Northouse LL, Weiss D
14. WHO. World health statistics (2010)
15. A perspective from the African organisation for research and training in cancer. *Lancet Oncol*. Challenges and opportunities in cancer control in Africa, Morhason-Bello IO, Odedina F, Rebbeck TR, Harford J, Dangou JM et al (2013)
16. Associations between advanced cancer patients' survival and family caregiver presence and burden. Dionne-Odom JN, Hull JG, Martin MY, Lyons KD, Prescott AT, (2016) pp. *Cancer Med* 5
17. family caregivers involvement in caring for hospitalized patient with cancer, Effendy C, Vernooij-Dassen M, Setiyarini S, Kristanti MS, Tejawinata S et al (2015)

18. Caring for caregivers and patients: research and clinical priorities for informal cancer caregiving, Kent EE, Rowland JH, Northouse L, Litzelman K, Chou WY et al (2016)
19. The impact of caregiving on the psychological well-being of family caregivers and cancer patients, Northouse LL, Katapodi MC (2012) *Ann M. Schafenacker, and Denise Weiss. Seminars in Oncology Nursing*, Vol 28, No 4 (November),
20. Caregiver Burden and Perceived Social Support among Caregivers of Patients with Cancer Ataturk Training and Research Hospital (2015) Izmir Katip Celebi University, Izmir, Turkey,. Fatma Kahrman and Ayten Zaybak.
21. Margaret F, Bevans RN, PhD LCDR, Esther M, Sternberg MD (2012 Jan) *Caregiving Burden, Stress, and Health Effects Among Family Caregivers of Adult Cancer Patients JAMA*. 25:398–403 307(4)
22. Factors associated with, Concato J, Fried TR et al (2008), pp. caregiver burden among caregivers of terminally ill patients with cancer. 20:38–43
23. Understanding economic and other burdens of terminal illness. the experience of patients and their caregivers, Emanuel EJ, Slutsman J et al (2009) pp. *ann intern med*;10:132-451
24. : A hospital based study in 2010 among cancer patients from Delhi. *Indian Journal of Cancer*. Lukhmana, Family caregiver’s burden, Bhasin S, Chhabra SK, Bhatia M (2015)
25. Anxiety (2013) depression and related factors in family caregivers of newly diagnosed lung cancer patients before first treatment. *Psycho-oncology*, Lee, Y., Liao, Y. C., Liao, W. Y., Shun, S. C., Liu, Y.
26. <https://www.lucaincroccifoundation.org/JUMC>,
27. Reliability, Hébert R, Bravo G, Prévile M (2000) .*Canadian Journal on Aging/Revue Canadienne du vieillissement*
28. Application of a multidimensional (1989) Caregiver Burden Inventory. Novac, M and Guest, C.I.

Figures

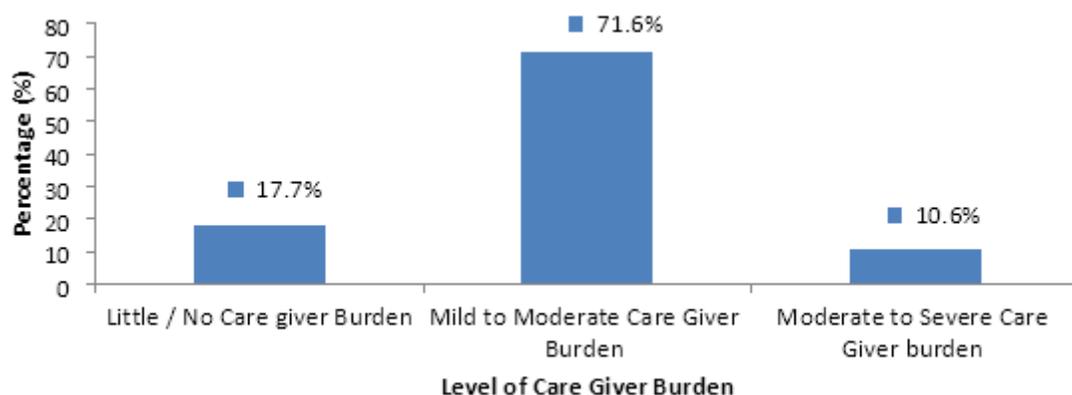


Figure 1

Distribution of care giver burden of the family based on Zarit Burden Score of the study participant, JMC, southwest, Ethiopia, 2021(n=141)

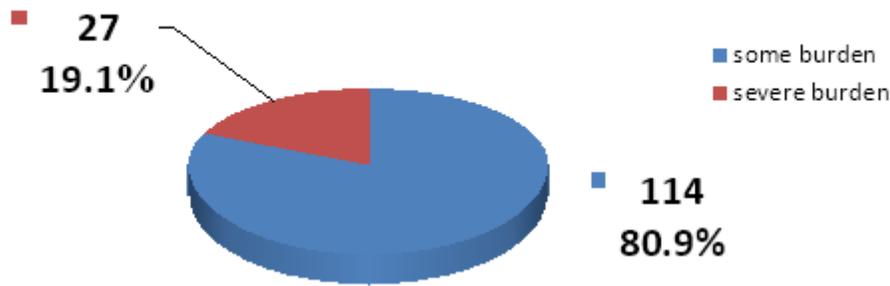


Figure 2

Caregiver burden among family caregivers caregiver inventory interview result on cancer patients at JMC, south west Ethiopia, 2021(n=141)

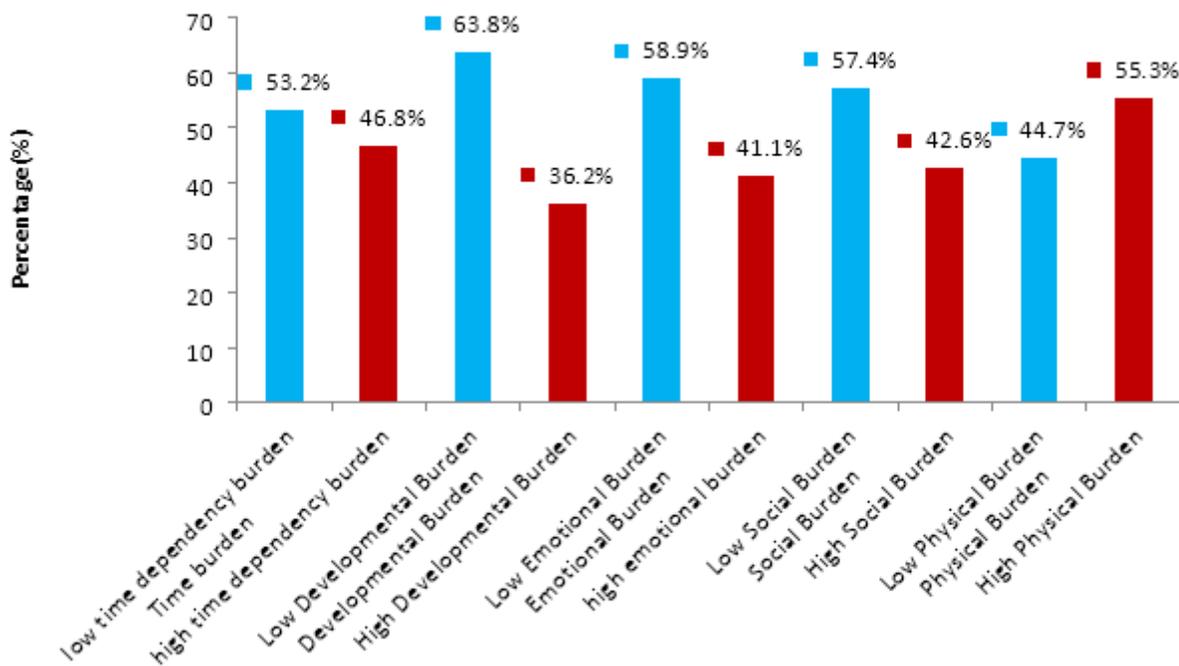


Figure 3

Caregiver burden among family caregivers the detailed Caregiver Inventory interview result on cancer patients at JMC, south west Ethiopia, 2021 (n=141)