Cancer Caregiver Quality of Life: Meta-Analysis

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Abstract

People living with cancer benefit greatly from informal caregivers. There has never been a previous meta-analysis on the quality of life of cancer caregivers or the efficacy of caregiver intervention programmes. The goal of this meta-analysis was to look at the quality of life of cancer caregivers and the impact of various initiatives aimed at improving it. From January 2006 to April 2021, a comprehensive literature search was conducted using PubMed, PubMed Central, Clinical Key, Google Scholar and Cochrane database. The effect of caregiver interventional programs on quality of life was evaluated using a mean difference between experimental and control groups. A random-effect model was used to measure the risk ratio (RR) for calculating the quality of life of cancer caregivers. The final report comprised eight trials with a total of 1142 participants. The caregiver intervention programme was found to improve the quality of life of cancer caregivers, but not statistically significantly (mean difference=0.10; $p<0.00001$). A caregiver interventional program had a positive effect on the quality of life of cancer caregivers, according to this meta-analysis. To prove that caregiver interventional programs are successful strategies for improving the quality of life of cancer caregivers, further randomised controlled trials are required.

Background

Advancement in technology and improvement in cancer diagnosis and care have resulted in a growing number of cancer survivors as evident by data given by International Agency for Research on Cancer (IARC) over 17.0 million new cancer cases and predictions of up to 27.5 million new cancer cases by 2040 globally. [1] By 2020, more than 19.3 million new cancer cases are expected to be diagnosed.[2] Approximately 43.5 million informal caregivers globally and among them one in every four caregivers spending 41 hours/week providing care to an adult or child.[3]

Informal caregivers are often family members or friends who are responsible for caring for people who are suffering from a variety of ailments such as old age, dementia, or cancer.[4] These caregivers provide 70 to 80 percent of cancer treatment and are present with patient throughout the cancer care process from diagnosis till death.[5] Caring for someone with cancer can be highly taxing; 50% of cancer caregivers experience higher levels of stress and depression, [6] and 40% suggesting that they need assistance in handling their own emotional and physical stress.[7, 8]

Caregivers' burden is described as "the degree to which caregivers believe that caring for others has negatively impacted their emotional, social, financial, physical, and spiritual well-being." [9] Increased anxiety, depression, loneliness, lack of social support, helplessness, loss of control, and fear of recurrence are examples of psychosocial symptoms faced by all caregivers including cancer caregivers also. [10] Lack of exercise, poor sleep, exhaustion, weight gain or loss, all of which contribute to decreased immune system function, coronary heart disease, and early mortality, are some of the more behavioural and somatic issues. [11] Lifting and moving heavy loads cause's musculoskeletal discomfort in caregivers in both older children and adult patients.[12] Thus all these affects overall quality of life (QOL) of caregivers.

Furthermore, studies on caregivers of mentally or physically ill patients found that caregivers' quality of life (QOL) had a significant effect on the QOL of the people they were caring for. [13–15] Burden on cancer caregivers will last for years after the patient's initial cancer diagnosis, with evidence of long-term health and QOL consequences. [16, 17] As a result, developing successful and realistic approaches to avoid and mitigate the psychological and physical stressors that minimise caregivers' QOL is critical. [18] The aim of this meta-analysis is to identify and compare cancer patient's caregiver quality of life.

Methods

The analysis protocol was written by using Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA)-2020 [19] guideline to assess and compare quality of life of cancer caregivers. (Fig. 1)

Data sources and selection criteria

Online published research studies from PubMed, PubMed Central, Clinical Key, Google Scholar, and Cochrane from January 2010 and April 2021. The quest was limited to peer-reviewed publications, papers written in English and research concerning human subjects. The search strategy followed the PICO (population, intervention, control, and outcomes) format, P = Caregiver, I = Cancer, C = Patients, O = Quality of life. Medical Subject Headings (MeSH) terms used for population were "Caregiver", "Family caregiver", "Spouse", "Partner", with intervention were "Cancer", "Oncology", with control were "Patient", "Cancer patient" and with outcome were "Quality of life", "QOL" were used to search the literature.

Selection of study

Two reviewers (KKR and CVK) screened titles and abstracts separately to find published studies. The research design included reported randomized controlled trials conducted in English from January 2010 to April 2021. Caregivers who are providing care to adult cancer patients were included. Exclusion criteria included studies involving children cancer patients and studies with qualitative methodology were excluded.

Outcome measures

Both independent authors (KKR and CVK) looked at the primary outcomes of the studies that were included, such as study characteristics and participant profiles. The main goal is to evaluate the quality of life of cancer patients' caregivers.

Data extraction

Data was extracted from the selected studies by two separate authors (KKR and CVK). Any differences in inclusion eligibility were resolved through discussion among the authors. Following the selection of each study, the data was tabulated in the form of author name, publication year, study design, study population, study characteristics, source of data collection, research tools and statistical methods used. Any necessary clarifications were obtained by emailing the correspondence author.

Risk Bias and Quality Assessment

The probability of bias was assessed separately by the writers KKR and CVK. Cochrane risk of bias assessment guidelines by Higgins et al were used. [20] Selection, performance, detection, attrition, reporting and other biases are included in the risk of bias graph and risk of bias overview for each selected RCT. (Figs. 2 & 3)

For each variable, all studies were categorised as low, high, or unclear risk. Any disagreements between the two independent authors were settled by consensus. The Chi-square test was used to evaluate heterogeneity using I^2 statistics of treatment effects among selected trials. Table 1 lists all of the data collected from the studies that were included.

Seven studies i.e. Fegg (2013) [21], Belgacem (2013) [22], Bahrami (2014) [23], Susan (2015) [24], Joanne (2015) [25], Virginia (2015) [26] and Lapid (2016) [27] had low risk of bias followed by one study i.e. Mabel (2015) [28] with moderate risk of bias.

Table 3
Characteristics of Included Studies (n = 8)

Author & Year	Exp Group/ Control Group	Exp Group/ Control Group Age (SD)	Exp Group/ Control Group Male & Female	Treatment Group	Research tool	Control Group	Setting
Fegg et al [21] (2013)	67/62	54.3 (13.5)/ 54.7 (12.9)	M-17 (28%), F- 50 (72%)/ M-19 (23%), F- 43 (67%)	EBT (Existential Behaviour Therapy) treatment for six sessions	WHOQOL-BREF i.e. WHO Quality of Life-BREF	Placebo	Germany
Belgacem et al [22] (2013)	33/34	56.6 (20.4)/ 62.5 (18.1)	M- 40.6%, F- 59.4%/ M- 42.4%,F- 57.6 %	Caregiver Educational Program	SF36 Health Survey comprises 36 items score from 0 (worst quality of life) to 100 (highest quality of life)	Placebo	France
Bahrami and Farzi [23] (2014)	32/32	36.94 (11.3)/ 38.97 (10.2)	M- 43.8%, F- 56.2%/ M- 28.1%, F-71.9 %	Supportive educational program based on COPE model	Caregiver Quality of Life Index-Cancer (CQOL-C)	Placebo	Iran
Mabel Leow et al [28] (2015)	40/40	NA	NA	Caring for Caregiver Programme (CCP)	EORTC Quality of life (QOL)	Placebo	Singapore
Susan C. McMillan et al [24] (2006)	111/109	63.06 (13.58)/ 59.98 (15.27)	M-24%, F-76%/ M-20%, F-80%	Coping skills intervention for Caregivers	Caregiver Quality of Life Index-Cancer (CQOL-C), which is 35 items scored by using a five point Likert-type scale	Placebo	South Florida

Author & Year	Exp Group/Control Group	Exp Group/Control Group Age (SD)	Exp Group/Control Group Male & Female	Treatment Group	Research tool	Control Group	Setting
Joanne M. Shaw et al [29] (2015)	64/64	55.7 (14.9)/52.7 (11.8)	M-27%, F-73%/M-28%, F-72%	Family Connect intervention	Caregiver QOL using the Short Form (SF)-12v2, a 12-item QOL questionnaires with two subscales that assess physical and mental well-being	Placebo	Australia
Virginia Sun et al [26] (2015)	197/157	57.54 (14.31)/57.23 (13.16)	M-39.4%, F-60.6%/M-36.2%, F-63.8%	Palliative care intervention	Caregiver QOL tool	Placebo	California
Lapid, M. I. et al [27] (2016)	47/53	Mean age & SD = NA	Male and Female = NA	QOL intervention for caregivers	Caregiver Quality of Life Index-Cancer Scale (CQOLC) with 35 items on 5-point Likert scales	Placebo	Rochester, USA

Data analysis

The final statistical study was carried out using RevMan Manager version 5.4 (The Nordic Cochrane Centre, The Cochrane Collaboration, Copenhagen) and the protocol from the current edition of the Cochrane Handbook for Systematic Reviews of RCT.

Continuous data on caregivers' quality of life outcomes was presented as a mean difference (MD) with a 95% confidence interval. Chi-square test was used to evaluate heterogeneity using I^2 statistics of treatment effects among selected trials. I^2 of 0% indicates no heterogeneity, 50% indicates minimal heterogeneity, and > 50% indicates substantial heterogeneity, according to the researchers. For the final meta-analysis, the researchers used a fixed-effect model with a significant p-value of 0.05 and an I^2 statistic of 50% (with non-overlapping of CI in forest plot suggesting heterogeneity). All p-values were two-sided, with 0.05 indicating statistical significance. The funnel graph for the mean difference with standard error was plotted to analyse the caregiver quality of life to evaluate possible publication bias.

Results

Study Selection and Characteristics

Initially, the PRISMA-2020 guidelines[30] were used to create the flow diagram that registered, screened, removed, and finally included in the search strategy. Using the PICO format (PubMed-24, PubMed Entral-10, Clinical Key-15, Google Scholar-18 and Cochrane-01) 68 studies were included, and 60 studies were omitted (Fig. 1). As a result of the screening, eight full-text RCTs qualified, meeting all eligibility criteria of this metanalysis.

Table 1 shows the characteristics of the eight trials that were included. A total of 1142 people took part in the eight trials in which caregivers were given training programmes to help them sustain and maintain their quality of life. For the primary outcome of caregiver quality of life, all eight trials had complete results.

To assess the impact of caregiver training programmes on maintaining their quality of life, funnel plots revealed no significant asymmetry from meta-analysis results (Fig. 4). The funnel plot of quality of life of cancer caregivers mean difference revealed no signs of publication selection bias.

Conclusions

Primary Outcome: Effect of Caregiver Interventional therapy of Quality of life

Total pooled result of eight studies (Fegg (2013) [21], Belgacem (2013) [22], Bahrami (2014) [23], Mabel (2015) [28], Susan (2015) [24], Joanne (2015) [25], Virginia (2015) [26] and Lapid (2016) [27]) showed no substantial difference in quality of life of caregiver with or without any intervention with MD- 0.10 (95% CI -0.26 to 0.46; $p < 0.00001$) (Fig. 5). The experimental group had 591 participants, while control group had 551 participants. The pooled analysis revealed high heterogeneity ($I^2 = 88\%$, $p < 0.00001$).

This metanalysis revealed that there is a need to plan, perform, and report research on caregiver quality of life so that can be put into effect, with an emphasis on efficacy. The metanalysis key finding was that experiments and evaluation tools for caregivers were not planned in a systematic ways to maximised the potential for interventions to be adopted effectively. From an existing framework, we can learned about the complexities of operationalizing implementation outcomes.

Limitations

According to this metanalysis, the documentation of cancer caregiver intervention research needs to be improved in order to promote their incorporation into practise. There seem to be two major concerns. To begin with, experiments were not planned in a way that maximised their chances of being implemented successfully. Second, in some cases, there is only a small amount of information available that is applicable to implementation.

Declarations

Authors' contributions

The authors contributed equally to the conception and writing of the manuscript. All authors read and approved the final manuscript.

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Not applicable

Consent for publication

Not applicable

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Figures

Figure 1

PRISMA Guidelines (PRISMA-2020)[19]

Figure 2

Risk of Bias Graph

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Bahrami 2014	+	+	+	+	+	+	
Belgacem 2013	+	+			+	+	
Fegg 2013	+	+	+	+	+	+	
Joanne 2015	+	+	+	+	+	+	
Lapid 2016	+			+	+	+	+
Mabel 2015	+	+	+	+	+	+	
Susan 2015	+	+	+		+	+	
Virginia 2015	+		+	+	+	+	

Figure 3

Risk of Bias Summary (Review the author's judgments on each risk of bias item for each included research in the risk of bias overview)

Figure 4

Funnel plot showing quality of life of caregivers SE (MD): Standard Error (Mean difference)

Figure 5

Forest plot showing quality of life of caregivers