Psychosocial Wellbeing of People with Cancer and Heart Disease: The Case of Clients in Ayder Referral Hospital, Northern Ethiopia

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Abstract
The purpose of this study was to gain a detailed understanding of psychosocial experiences of people with cancer and heart disease. One hundred twenty people with cancer and heart disease were surveyed. They were asked to indicate their degree of agreement related to their experience to the disease on each scale. A large proportion of patients reported experiencing severe to mild psychosocial problems in their day to day activities. Patients reported experiencing problems in the areas of anxiety (90.9%), depression (90.8%), psychological (73.3%), social (65.8%), coping (83.3%), and psychosocial wellbeing (88.3%). T-test indicated significant gender difference. Whereas, one-way ANOVA indicated the absence of significant disease type difference for psychosocial wellbeing. In conclusions many people with cancer and heart disease were experiencing psychosocial problems since they are diagnosed with their disease.
Keywords: Psychosocial wellbeing, Cancer and Coronary Heart Disease

Introduction

Cancer and heart disease are major health problems throughout the world. CVD is the most widespread and the most costly health problem in the industrialized world. With rising cardiovascular problem there has been increasing interest in the observed association between poor cardiovascular health and poor psychological health (Anyadubalu, 2010).

The annual cost of cancer including both direct medical cost and indirect cost due to disability, work loss, and premature mortality, were estimated to be $98 billion in 1997. Because, of its increasing prevalence, disease burden on the individual, and economic cost to the nation, cancer should be seen as a prominent health problem (Nezu &, Nezu, 2003).

Proper psychosocial support for people with cancer and heart disease achieves far better medical outcomes than physical care alone, but still in the case of our country most of the persons who are suffering from cancer and heart disease whenever they are moved to health centers they are given only medical treatment. Therefore, in the promotion of the psychosocial wellness of people with cancer and heart disease, the physicians, the family of the patient, the patient himself, and friends can play a significant role, in addition to counselors and social workers.

Taking the above in to account there is a need to conduct studies in hospitals to identify the specific health related problem of cancer and heart patients. This study attempts to explore the psychosocial wellbeing of people with cancer and heart diseases. Therefore, the main objective of this study was to identify the psychosocial wellbeing of people with cancer and heart diseases at Ayder referral hospital Tigray, Ethiopia**.**

Materials and Methods

Research Design

Quantitative research design were used to gather numerical data related to the psychosocial wellness of cancer and heart patients, using survey design which can be analyzed through statistical procedure. A cross-sectional survey design was preferred types of data collection in this study for its advantage of economy and limited time.

Population and Sampling

The target population of the study was consisting of all male and female patients of cancer and heart disease in Ayder Hospital who are receiving medical service in the hospital.

Using both stratified and purposive sampling technique, 66 participants from heart (33 males and 33 females), 66 participants from cancer (33 males and 33 females) were selected when they come to the hospital for medical treatment. Among this sample, 120 participants were involved in filling the questionnaires.

Ethical Consideration

An information sheet describing the aim of the study and explaining that participants could withdraw themselves from participating to fill the questionnaire and not to be interviewed without any negative consequence on treatment of their illness were attached to the questionnaire and explained to the respondents, as well as, it also explained for the participants who are involving in the interview before starting the interview. Participants were

requested to sign a consent form to give their consent to participate in the study. The researcher, also consulted the medical specialist from the department of cardiology..

Results

The results of this study are discussed in two parts. First, descriptive data concerning demographic characteristics and psychological wellbeing are presented. And then analyses of each research question are offered.

Table 1: Means, Standard Deviations, Number of Items, and Alpha Reliability of Anxiety, Psychological Well-being, Coping, Social well-being, Depression and, Total Psychosocial Well-being Measures (n=120)

Variable	No. of items	Alpha reliability	Mean	Std. Deviation	Minimum score	Maximum score
Anxiety	12	.668	21.12	5.093	14	37
Psychological well being	20	.788	41.48	9.661	23	62
Coping	8	.535	16.23	3.884	9	28
Social wellbeing	6	.697	12.88	3.945	6	24
Depression	10	.729	18.41	5.002	10	36
Psychosocial wellbeing	56	.917	110.12	23.924	67	167

As indicated on the above table, the entire sample scores on anxiety ranges from 14 to 37 with a mean of 21.12 and Std. Deviation of 5.093. This means that the majority of the respondents have been found to have mild – severe level of anxiety. On the other hand, the sample scores on psychological wellbeing, ranges from 23 to 62 with a mean of 41.48 and Std. Deviation of 9.661. This reveals that the majority of the respondents have been found to have low level of psychological wellbeing. With regard to respondents' level of depression, the whole sample scores range from 10 to 36 with a mean of 18.41 (S.D = 5.002). This also reveals that many of the respondents have mild – severe depression.

With regards to respondents' level of social wellbeing, the entire sample scores ranges from 6 to 24 with a mean of 12.88 (S.D = 3.945). This show that the majority of the respondents have been found to have low social wellbeing. The entire sample scores on coping strategies, ranges from 9 to 28 with a mean of 16.23 (S.D = 3.884). This also indicates that the majority of the respondents have been found to have poor coping strategies. In addition to this, the whole scores on the above scales ranges from 67 to 167 with a mean of 110.12 (S.D = 23.924), which reveals experience of low level of psychosocial wellbeing among the respondents.

Demographic Characteristics

One hundred and twenty people participated in this cross-sectional descriptive study, of whom 60 are diagnosed with CHD and 60 were diagnosed with cancer and they are currently following their treatment.

Table 2. Demographic Characteristics of the People with Cancer and Heart Disease (n=120)

	N	%
Age(years old)		
31-40	36	30.0
41-50	41	34.2
51-60	31	25.8
61-70	11	9.2
71 and above	1	.8
Gender		
Male	57	47.5
Female	63	52.5
Educational status		
Illiterate	21	17.5
1-8	40	33.3
9-12	37	30.8
Above 12	22	18.3
Marital status		
Single	14	11.5
Married	76	62.3
Divorced	23	18.9
Widowed	7	5.7

* >30 years old

As indicated on the above table, there were 57 males (47.5%) and 63 females (52.5%). The average age of the participants was 47.16 years (aged 31–71 years old). The majority of participants (34.2%) were found in the age range from 41– 50, followed by age range from 31-40(30%) and 51-60(25.8%). The majority were married (62.3%) and divorced (18.9%); 11.5% were single, and 5.7% were widowed. The educational status of the majority (33.3%) were from grade 1-8 and, 30.8% had attended high school education (9-12), 18.3% had attended college (above 12) and, 17.5% have never attended formal education.

Table 3: Mean and Standard Deviation of People with Cancer and Heart Disease

Types of diagnosis	Category	Anxiety	Depression	Psychological wellbeing	Social wellbeing	Coping strategy	Psychosocial wellbeing
Cancer	Mean	21.58	18.98	41.82	13.12	16.38	111.88
	Std. Deviation	5.296	5.261	9.468	3.760	3.787	24.104
	N	60	60	60	60	60	60
Heart disease	Mean	20.65	17.83	41.13	12.65	16.08	108.35
	Std. Deviation	4.881	4.702	9.917	4.141	4.005	23.812
	N	60	60	60	60	60	60

As indicated on the Table 3, the psychosocial wellbeing of those people with cancer and heart disease were determined by sum of individuals mean score values. Those individuals with mean score greater than or equal to 168 for psychosocial wellbeing measure, were considered as having better psychosocial wellbeing, and those with mean score values of less than were considered as having poor psychosocial wellbeing. Likewise, those with mean score equal or greater with 50 and 15, or less than 50 and 15 were considered as having better and poor in their psychological and social wellbeing respectively. On the other hand, those individuals with mean score less than 30 on anxiety measure and 25 on depression measure, were considered as experiencing mild- severe anxiety and depression respectively. Moreover, those with mean score equal or greater than 20, or less than 20 were considered as having better and difficulty in their coping mechanisms respectively.

This result indicates that the people with cancer and heart disease have mean score values of (21.58, 20.65), (18.98, 17.83), (41.82, 41.13), (13.12, 12.65), (16.38, 16.08), and, (111.88, 108.35) to anxiety, depression, psychological wellbeing, social wellbeing, coping, and psychosocial wellbeing measures respectively. This means that the mean scored by both cancer and heart patients were below the standard value and this consequently indicate that both cancer and heart patients have difficulty in their psychosocial wellbeing.

The Psychosocial Wellbeing Level of People with Cancer and Heart disease

To examine the psychosocial wellbeing level of people with cancer and heart disease, data has been collected from the respondents (people with cancer and heart disease). The result of the findings is presented as follows.

Table 4: Level of Anxiety, Depression, Psychological Wellbeing, Social Wellbeing, Coping Strategies and, Psychosocial Wellbeing

Variables	No	%
Mild – moderate anxiety	16	13.4
Moderate – severe anxiety	45	37.5
Severe anxiety	49	40.8
Mild – moderate depression	27	22.5
Moderate – severe depression	36	30
Severe depression	46	38.3
Low psychological well being	36	32.5
Very low psychological well being	49	40.8
Low social well being	40	33.3
Very low social well being	39	32.5
Poor coping	58	48.3
Very poor coping	42	35
Low psychosocial well being	46	38.3
Very low psychosocial well being	60	50

Most of the respondents have difficulties related to their psychosocial wellbeing. Specifically, as indicated on the above table, out of the entire sample as measured by multidimensional wellbeing scale, 73.3% of the respondents have low (32.5%) to very low (40.8) psychological wellbeing. And their level of anxiety as measured by hospital anxiety scale: the majority of the respondents experienced severe anxiety which constitute of 40.8%. While some 37.5% and 13.4% of the respondents' experienced moderate – severe and mild – moderate

anxiety respectively. On the other hand, their level of depression as measured by hospital depression scale: the majority of the respondents were severely depressed which constitute of 38.3%. Whereas 30% and 22.5% of the respondents were depressed from moderate – severe and mild – moderate respectively.

In terms of their social wellbeing as measured by social relation and social integration scale; out of the entire sample, majority of the respondents (65.8) have problems related to their social wellbeing from low (33.3%) to very low (32.5%) in their day to day life. Moreover, the majority of the respondents (83.3%) have difficulty to cope with their psychosocial problems. In general, out of the entire sample as measured by the above scale, 50% of the respondents have very low psychosocial wellbeing and, 38.3% of them have low psychosocial wellbeing.

Psychosocial Wellbeing Difference between Sex of Patients (i.e. cancer and heart patients)

On the basis of participant's response to each items, mean and, std. deviation were computed in order to describe the position of the participants, consequently the mean difference on participant's variables using t-test and ANOVA were computed. More specifically, mean differences in sex and diagnosis type were computed.

Table 5: Sex Difference and Experience of Anxiety

Sex	N	Mean	S.D	T	Df	Sig.
F	63	18.57	2.734	-6.747	118	0.00
M	57	23.93	5.612	-6.542	79.328	

***Significant at .05**

As indicated in Table 5, the mean score of male and female patients were 23.93 and 18.57 respectively with std. deviation of 5.612, and 2.734 respectively. T-test was significant at, T (1, 118) = 47.255, p<.05. Hence, female patients were showed higher level of anxiety than male patients.

Table 6: Sex Difference and Psychological Wellbeing

Sex	N	Mean	S.D	T	Df	Sig.
F	63	36.56	7.596	-6.926	118	0.00
M	57	46.91	8.782	-6.876	111.381	

***Significant at .05**

As seen in Table 6, the mean score of males and females were 49.91 and 36.56 respectively with std. deviation of 8.782, and 7.596 respectively. T-test shows, T (1, 118) = 3.248, p<.05. Which was statistically significant, consequently, female patients experienced lower level of psychological wellbeing than male patients.

Table 7: Sex Difference and Coping Strategies

Sex	N	Mean	S.D	T	Df	Sig.
F	63	14.57	3.156	-5.500	118	0.00
M	57	18.07	3.807	-5.448	109.160	

***Significant at .05**

As revealed in Table 7, the mean score of male and female patients are 18.07 and 14.57 respectively with std. deviation of 3.807, and 3.156 respectively. The t-test on coping shows, T(1, 118) = 2.100, p<.05, which was statistically significant. As the result indicates female patients' experienced poor coping mechanism than male patients.

Table 8: Sex Difference and Social Wellbeing

Sex	N	Mean	S.D	T	Df	Sig.
F	63	11.16	2.903	-5.651	118	0.00
M	57	14.79	4.087	-5.557	99.970	

*Significant at .05

As Table 8 displays, the mean score of male and female patients were 14.79 and 11.16 respectively with std. deviation of 4.087, and 2.903 respectively. T-test for social well-being was significant, T(1, 118) = 4.242 , p<.05, showing that female patients experienced lower social wellbeing than male patients.

Table 9: Sex Difference and Experience of Depression

Sex	N	Mean	S.D	T	df	Sig.
F	63	15.94	3.364	-6.643	118	0.00
M	57	21.14	5.115	-6.512	95.244	

***Significant at .05**

As indicated on the above Table, the mean score of male and female patients were 21.14 and 15.94 respectively with std. deviation of 5.115, and 3.364 respectively. T-test for depression was also significant, T(1, 118) = 3.581 , p<.05. as a result, female patients experienced higher depression than male patients.

Table 10: Sex Difference and Psychosocial Wellbeing

Sex	N	Mean	S.D	T	df	Sig.
F	63	96.79	16.448	-7.895	118	0.00
M	57	124.84	22.278	-7.779	102.366	

***Significant at .05**

As indicated on Table 10 above, the mean score of male and female patients were 124.84 and 96.76 respectively with std. deviation of 22.278, and 16.448 respectively. The t-test for psychosocial wellbeing was significant, T(1, 118) = 5.239 , p<.05. Hence, female patients showed lower psychosocial wellbeing than male patients.

Psychosocial Wellbeing Difference between People with Cancer and Heart Disease.

Table 11: A Summary Table of One-way ANOVA for the Effect of Disease type on the Psychosocial Wellbeing

Variables	Groups	Sum of Squares	Df	Mean Square	F	Sig.
Anxiety	Between Groups	26.133	1	26.133	1.008	.318
	Within Groups	3060.233	118	25.934		
	Total	3086.367	119			
Psychological wellbeing	Between Groups	14.008	1	14.008	.149	.700
	Within Groups	11091.917	118	93.999		
	Total	11105.925	119			
Coping	Between Groups	2.700	1	2.700	.178	.674
	Within Groups	1792.767	118	15.193		
	Total	1795.467	119			
Social wellbeing	Between Groups	6.533	1	6.533	.418	.519
	Within Groups	1845.833	118	15.643		
	Total	1852.367	119			
Depression	Between Groups	39.675	1	39.675	1.594	.209
	Within Groups	2937.317	118	24.893		
	Total	2976.992	119			
Psychosocial wellbeing	Between Groups	374.533	1	374.533	.652	.421
	Within Groups	67733.833	118	574.016		
	Total	68108.367	119			

***p>.05**

Table 11 shows the findings from the one-way ANOVA that was conducted with cancer and heart disease as independent variables and psychosocial wellbeing as the dependent variable. For anxiety and depression scale the result of ANOVA was not significant at, F (1, 118)=1.008,p>.05 and at, F(1, 118)=1.594, p>.05 respectively. Hence, there were no significant level of difference in experiencing anxiety and depression between cancer and heart disease patients. Similarly, ANOVA for psychological wellbeing was not significant, F(1, 118)=.149, p>.05. Therefore, there were no significant variations on the level of psychological wellbeing between cancer and heart disease patients. The ANOVA for social wellbeing was also not significant, F (1, 118) =.418, p>.05. Thus, the result reveals that statistically significant difference was not observed on the social wellbeing of cancer and heart disease patients. Moreover, ANOVA for coping strategies was not significant, F (1,118) =.178, p>.05. Consequently, there were no significant variations on coping level between the two groups. Beside this, the apparent psychosocial wellbeing difference among the illness groups did not attain conventional levels of statistical significance, F(1, 118)=.652, p>.05. The result shows that, there were no psychosocial wellness differences between the people with diabetes and heart disease.

Discussion

Psychosocial Wellbeing level of People with Cancer and Heart Disease

Findings of this study indicate that 38.3% of people with cancer and heart disease have severe depression in this study, as assessed by Hospital depression scale which was higher than the 32.7% clinical cut-off for depression reported in other clinic samples (Walker, 2008). In the current study 30% and 22.5% of the participants were depressed from moderate – sever and mild – moderate level respectively. This findings are also supported by Fhkams'(2006) study who found that major depression in patients with chronic disease have been reported to be as high as 26% to more than 40%.

In the current study 40.8% of the patients exhibited severe anxiety and 37.3% of them experienced moderate – severe anxiety. The finding shows significantly higher anxiety rates in people with cancer which was consistent with previous studies (Chapa, Jones, Smith, Donner &, Friedmann, 2009). Anxiety tends to have similar effects to depression on CAD. The prevalence of anxiety is reported to be higher in CAD patients than in the general population (Bergvic, 2008).

The high prevalence of psychological disturbance in people with cancer and heart disease were provided in this study. In consistent to this study Fhkams' (2006) found high-level of psychological distress in the people with CHD. This is also supported with results reported by Walker (2008) in which cancer affect psychological wellbeing of those people. People with cancer and heart disease in the current study also, exhibited low (32.5%) to very low(40.8%) psychological wellbeing in their day to day activities with their disease.

The lower level of social relationship and social integration in this study was consistent with the findings in most other studies of patients with cancer (Degazon &, Parker, 2007). However, Anyadubalu (2010) found that a majority of the CHD patients were social persons, and so perceived no relationship in their social lives and their attack of CHD, which is not consistent to the findings in this study. The result in this study indicate that people with cancer and heart disease show low(33.3%) to very low(32.5%) social wellbeing from the time they diagnosed with their disease.

The use of ineffective coping strategies was related to ineffective psychosocial adaptation to cancer and heart disease in this study. These findings concerning the poor coping strategies are consistent with Taylor, Frier and Deary (2002). In this study people with cancer and heart disease showed poor (48.3%) to very poor (35%) coping strategies in dealing with their psychosocial problems related to their disease.

In general, this study has identified very low(50%) to low(38.3%) psychosocial wellbeing in the people with cancer and heart disease that were assessed based on the instrument that measure psychosocial wellbeing. These findings concerning the lower level of psychosocial well-being in the people with cancer and heart disease are consistent with Taylor, Frier and Deary (2002).

Gender and Group Difference on the Psychosocial Wellbeing of People with Cancer and Heart Disease

Significant gender differences were observed regard to the experience of depression. This result is consistent with those of Plach, &,Heidrich.(2002) and Chapa, Jones, Smith, Donner &,Friedmann.(2009) who have asserted that higher depression in women (28%) than men(18%) in the people with heart disease. The finding of significantly higher anxiety rates in women than men was consistent with previous studies (Rubin &, Peyrot, 1999). Similarly, Rubin &, Peyrot (1999) found that significant gender difference in experiencing anxiety.

Even more significant gender differences with regard to psychological functioning were reported in the current study. Inconsistent to this finding, Fhkams(2006) detected the nonexistence of significant gender difference in psychological wellbeing in the CHD patients. However, Rubin &, Peyrot (2001) detected the existence of significant gender difference in psychological functioning in the cancer patients. Significantly more females than males reported experiencing severe problems in the area of social functioning as reported in this finding. Koch, Kralic &, Sonnack (1999) also found differences between male and female patients with regard to overall social activities with their disease. This study found that significant gender difference in the area of coping strategy. Inconsistent to this study, Degazon &, Parker (2007) found absence of significant gender-related differences in coping strategies.

Gender differences were found in psychosocial wellness of people in this study, but other investigators have reported men and women report psychosocial problems without significant difference in psychosocial problems (Degazon &, Parker, 2007). In contrast to this study, Dixon, Lim, Powell & Fisher (2000) also found no significant gender-related differences in psychosocial outcomes of heart patients.

Beside this, the apparent psychosocial well-being differences among the illness groups did not attain conventional levels of statistical significance in this study. The result shows that there were no psychosocial wellness differences between the people with cancer and heart disease found for any of the psychosocial wellbeing-scales. In contrast to this finding, Rubin &, Peyrot (1999) compared psychosocial wellness in those people, with cancer, and heart disease and reported that better quality of life in cancer than heart patients.

Conclusion and Implications

Conclusion

The aim of the present study was to explore the psychosocial wellbeing of people with cancer and heart disease. Quantitative study was conducted to understand the psychosocial well beings, from the patients' perspectives. Many people with cancer and heart disease were experiencing Severe to mild psychosocial problems. Being female was associated with lower experience of psychosocial wellbeing in the individuals with cancer and heart disease. However, types of the diagnosis not act as a variation for the psychosocial wellbeing of people between cancer and heart patient. Results indicated that anxiety, depression, psychological disturbance, social difficulty and coping problem were central to the essence of this experience. Previous research findings can be seen as relevant in that they reveal the psychosocial experiences of people with cancer and heart disease, but they do not address the lived experiences of those patients.

Implications

Psychological perspective

- Those people with cancer and heart disease research who are psychologically challenged due to their medical health conditions should be referred to a counselor or health social worker. Such psychological challenges include: feeling depressed, intense fear and worry, anxiety, loneliness, alteration of mood and thoughts of making suicide.

Social perspective

- The interdisciplinary team should aim to provide preventive interventions for patients and families (include training parents in effective behavior management skills). These interventions should emphasize appropriate family involvement and support (i.e., teamwork) in cancer and heart disease management, effective problem-solving and self-management skills.
- The researcher recommends counseling for the patients who view social life as uncomfortable and upsetting in that they will be experiencing more social problems which can lead to deterioration of their health condition.

References

Anyadubalu, C.C.(2010). The experiences of coronary heart disease patients: biopsychosocial perspective. *International Journal of Human and Social Sciences, 5(10),614-621.*

Baranyai, R.(2006). *Biopsychosocial and behavioural correlates of coronary heart disease*. Retrieved February, 11, 2015 from http://phd.sote.hu/ mwp/phd_ live/vedes/export/baranyaireka.e.pdf

Bergvik, S. (2008). *Psychological factors in the recovery of Coronary Artery Disease patients in Northern Norway*. Retrieved march 01, 2015 from http://www.ub.uit.no/munin/bitstream/handle/10037/2104/thesis.pdf?sequence=5

Chapa, D., Jones, D., Smith, J., Donner, T. & Friedmann, E.(2009). Depression, quality of life, and glycemic control in individuals with cancer. *Journal of the American Academy of Nurse Practitioners, 21, 214–224*.

Degazon,C.E. & Parker,V.G.(2007). Coping and psychosocial adaptation to cancer in older blacks born in the southern US and the Caribbean. *Research in Nursing & Health,* 30, 151–163.

Dixon, T., Lim, L.L.-Y., Powell, H. & Fisher, J.D.(2000). Psychosocial experiences of cardiac patients in early recovery: a community-based study. *Journal of Advanced Nursing 31(6), 1368-1375.*

Fhkam, J.W.(2006).Psychological distress in elderly patients with congestive heart failure. *Asian J Gerontol Geriatr, 1(3), 121–32...*

Nezu, A.M., Nezu, C.M., Geller, P.A.(2003). *Handbook of psychology Vol 9: Health psychology*. New Jersey: John Wiley & Sons, Inc.

Plach, S.K. & Heidrich, S.M.(2002). Social role quality, physical health, and psychological well-being in women after heart surgery. *Research in Nursing & Health,* 25, 189–202.

Rubin, R.R. & Peyrot, M.(2001). Psychological issues and treatments for people with cancer. *Journal of Clinical Psychology*, 57(4), 457–478.

Rubin, R.R. & Peyrot, M.(1999). Quality of life and cancer. */Metabolism Research and Reviews, 15, 205-21.*

Walker, K.T.(2008). *A bittersweet existence: The lived experiences of four young women with cancer*. Retrieved February 06, 2015 from https://qspace. library.queensu.ca/jspui/bitstream/1974/1339/1/Walker_Kaitlyn_T_200807_MEd.pdf

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