

The Effect of Family Psychoeducation on Social Support among Congestive Heart Failure Patients

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Abstract

The prevalence of CHF is increasing every year. The impact of a psychosocial condition requiring comprehensive treatment for CHF in all aspects. One contributing factor to success is the involvement of the family. **Purpose:** This study aimed to determine the differences of social support towards clients with CHF who were receiving family psychoeducation. **Method:** This study used a Quasi -experimental pre-post test without a control group". A sample of 25 respondents and sample retrieval techniques with a purposive sampling procedure. The instrument used was an ISSB questionnaire for measuring social support. The intervention group was provided with family psychoeducation that performed 5 sessions. **Result and conclusion:** The finding this study showed was a significant change before and after the family support family psychoeducation ($p\text{-value } 0.00 < \alpha$). Characteristics of the family and the client is not associated with social support. Family psychoeducation research way recommended developed in a public hospital.

Keywords: Congestive heart failure, patients, family caregivers, family psychoeducation and social support

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INTRODUCTION

Disorders of the cardiovascular system have an impact on the physical and psychological client. Psychologically, disruption of the cardiovascular system affects functional status, employment status and relationships between people (Sullivan, 2009). Clients who experience cardiovascular system disorders will experience psychosocial problems and a decreased quality of life (Hwang, 2012). The occurrence of psychosocial problems and decreased quality of life in clients with cardiovascular system disorders is very possible because clients often experience rehospitalization (Sullivan, 2009).

Congestive heart failure (CHF) is heart disease with a high mortality and recurrence rate. High recurrence rates can make a decrease in the quality of life of patients. In addition, CHF requires complex medical treatment but still has a poor prognosis (Volz., Schmid., Zwahlen., Kohls., Saner., & Barth, 2011).

Psychological factors or the presence of psychosocial stressors that

trigger negative emotions such as depression, anger, hostility and, anxiety affect the CHF disease experienced by clients (Smith., Gidron., Kupper., Winter., & Denollet, 2009). Psychosocial stressors trigger an uncontrolled increase in blood pressure and in the subsequent process will interfere with heart contractions (Ratnasingam, 2007). An uncontrolled increase in blood pressure has a 6 times greater chance of experiencing CHF (Rahajeng & Tuminah, 2009). Referring to the conditions above, clients with CHF need good psychosocial treatment so that the condition of the disease experienced by the client does not get worse.

The impact of CHF on the client's psychosocial condition requires thorough handling of all aspects. Psychosocial stressors and social support significantly influence heart disease. Clients of heart disease who experience psychosocial problems will be slower in the healing process, more severe physical symptoms they experience and longer rehabilitation process (Ratnasingam, 2007). In fact, one of the factors supporting the success of therapy is the involvement of clients and family in the therapy process (Brunner & Suddarth, 2009).

Social support is an important element in the success of family members in performing and maintaining new health behaviors (Glanz, Lewis & Rinner, 1997 in Friedman, Bowden & Jones 2003). Having and caring for family members with cardiovascular system disorders can cause stress and burden for the family (Hwang, 2012). Some study results write that family (caregiver) can experience psychosocial problems and a decreased quality of life with illnesses experienced by clients. Family stress can arise due to caring for clients, in addition to stress various other aspects also affect. These aspects are physical, mental, social and financial (Given, 1992; Alspach, 2009; Hwang 2012). Illness that does not heal, the threat of death and the high cost of treatment is a source of stress and financial burden for families. Indeed disruption of the cardiovascular system to cure it requires expensive costs because some disorders of the cardiovascular system require surgery or continuous treatment during life (Lubiantoro, 2011). The existence of this reality requires the role of a mental nurse who is able to provide nursing care to the family by providing information and education through therapeutic communication.

Family psychoeducation research related to families who have family members with heart disease shows that psychoeducation provided for 2 hours in 6 weeks for 57 family participants with family members experiencing stable angina showed improvement in symptoms of the disease in the client (McGillion, Michael., Judy., Bonnie., Sandra., Coyte., Graham 2008). Sullivan et al (2009) explained that family psychoeducation provided for 2.25 hours for 8 weeks to 117 participants with family members experiencing CHF showed improvement in CHF symptoms experienced by clients in 12 months. Nurbani (2009) conducted 5-session family psychoeducation for 5 sessions on stroke for 45 participants (22 intervention participants) wrote that the intervention group experienced a significant decrease in anxiety (p-value 0.003). Referring to the various results of the study, researchers used family psychoeducation as an intervention to see how family support.

METHOD

This study uses a quasi-experimental method, pre-post test design without a control group with family psychoeducation intervention. Psychoeducation is carried out at each caregiver for 4 days with the time agreed in the consultation room using a workbook that has been made. Psychoeducation is carried out for 30 - 45 minutes each time during the 4 meetings. In conducting the study 25 caregiver families were selected by researchers through a purposive sampling technique with the inclusion criteria of the caregiver willing to participate fully, the CHF client who was treated in a stable condition, the caregiver was a family member and lived in the same house as the client.

RESULTS AND DISCUSSION

Social support measuring instrument consists of 29 statements developed from an inventory of socially support (ISSB). ISSB is a measuring tool to measure enacted support. This questionnaire was measured on a Likert scale (1-4) which was assessed with 1 never, 2 sometimes, 3 often, 4 always. The questionnaire consisted of 12 statements of emotional support, 6 statements for appreciation support, 6 statements for instrumental support and 5 statements for information support. Validity and reliability tests were carried out on 30 caregivers with the results of the validity test $> 0.3.74$ and reliability with a Cronbach's coefficient alpha value of 0.909.

Family psychoeducation interventions can increase the support sub-variable by a difference between 2.36 - 7.52 points and change the mean total social support to be higher by around 17.72 points. The results of statistical tests show that there are significant changes in emotional support, appraisal, instrumental, information and total family support between before with after family psychoeducation (p-value $0.0005 < \alpha$).

CHF is one of the chronic diseases with a high risk of death (WHO, 2008). This fact becomes a fear both for clients and families. Problems faced by clients with CHF are not only physical problems but also psychosocial problems. CHF client psychosocial problems can be experienced by clients themselves or families, with the social support of CHF clients will have a more positive attitude to adhere to therapy

Table 1. changes social support before and after family psychoeducation 2019 (n = 25)

Subvariable/ Variable	Intervention FPE	Mean	SD	<i>p value</i>
Emotional support	before	32.36	5.195	0.000
	after	39.88	4.46	
	difference	7.52	0.74	
Appraisal support	before	14.68	2.996	0.000
	after	19.04	2.26	
	difference	4.36	0.74	
Instrumental support	before	14.12	3.38	0.000
	after	19.32	2.14	
	difference	5.2	1.24	
Informational support	before	12.52	3.111	0.006
	after	14.88	2.977	
	difference	2.36	0.13	
Social support	before	73.68	10.54	0.000
	after	91.40	8.48	
	difference	17.72	2.06	

(Eversun-Rose & Lewis, 2005). Facing family members with CHF will make the family worry about the illness experienced by the client ((Volz., Schmid., Zwahlen., Kohls., Saner., & Barth, 2011). Based on these findings, the researcher believes that the quality of social support in the form of emotional support, appreciation, instrumental and information provided by the family can be influenced by psychosocial problems that arise in families who have family members who experience CHF.

The mean emotional support in caring for family members who experience CHF before family psychoeducation is done 32.36 after family psychoeducation increases to 39.88. Meaning of appreciation support in caring for family members who experienced CHF before family psychoeducation was carried out 14.68 after family psychoeducation increased to 19.04. The mean of instrumental support in caring for family members who experience CHF before family psychoeducation is 14.12 after family psychoeducation increases to 19.32. The mean of information support in caring for family members who experience CHF before family psychoeducation is 12.52 after family psychoeducation increases to 14.88. The mean total social support before family psychoeducation was 73.68 after family psychoeducation increased to 91.40. The provision of family psychoeducation

can enhance a family's ability to provide emotional support, appreciation, instrumental and information to family members with CHF. This is because every caregiver has the opportunity to express psychosocial problems encountered while caring for and is taught how to provide emotional support, appreciation, instrumental and information to family members with CHF.

Provision of therapy as many as 4 meetings for 5 psychoeducation sessions. The provision of therapy is carried out in accordance with the frequency and intensity of therapy in previous studies that have used family psychoeducation for physical problems treated in hospitals. Researchers observations after conducting psychoeducation sessions 1 and 2 (assessment of family problems and family education on how to care for clients with CHF and provide family support to clients with CHF) families express more diligently to remind sick family members to take medicine, abstinence from food and families feel more understanding signs and symptoms experienced by the client. In addition, the researcher also observed that after the psychoeducation session 1 and 2 families openly revealed the problems they experienced related to their care and personal problems and that most of the families were able to explain how to care and provide family support. After being given session 3 (family stress management) the family revealed being able to independently take deep breaths and

Table 2. Analysis of the relationship between age and income with social support 2019 (n=25)

Support	Variabel	R	p value
Emotional	age	0.36	0.08
	Income	0.07	0.75
Appraisal	age	0.196	0.35
	income	0.10	0.63
Instrumental	age	0.28	0.17
	income	0.31	0.13
Information	age	0.11	0.59
	income	0.196	0.35
Social support	age	0.29	0.16
	income	0.02	0.93

the 5 finger technique. According to the family, the method taught can help them to reduce anxiety and even annoyance when caring for clients who are difficult to manage. After being given session 4 and session 5 (burden management and family empowerment) the family was able to mention the potential possessed by the family and the alternatives carried out to overcome the burden. Based on an evaluation of the overall psychoeducation results, the family revealed that what was done with the specialist nurse as a therapist was very beneficial.

Previous studies using family psychoeducation therapy on physical problems that cause psychosocial problems have been conducted by Nurbani (2009) in families of stroke patients with a sample of 22 intervention group families and 23 control group families. Psychoeducation has carried out as many as 5 sessions in 5 meetings with a meeting time of 45 minutes every day. From the results of the study found that there was a significant decrease in anxiety in families who care for family members with stroke after receiving family psychoeducation.

In addition, the results of Rahayu's (2011) study on the families of leprosy patients with a sample of 21 intervention group families and 21 control group families. Psychoeducation has carried out as many as 5 sessions in 3 meetings with a meeting time of 45 minutes every 2 weeks. From the results of the study, it was found that there were significant differences in family psychosocial support in families caring for family members with leprosy after receiving family psychoeducation.

Based on the results of research Nurbani (2009) and Rahayu (2011), it can be concluded that the provision of psychoeducation can improve the ability of families to provide family support to family members with CHF. That is because at every psychoeducation session conducted can help families in increasing emotional support, appreciation, instrumental and information. In addition, the implementation of family psychoeducation conducted in public hospitals can be given consecutively every day for each session. However, the place of the entire psychoeducation session for families with physical ailments must still be considered because it could be a place that can affect the psychological condition of the family. This, research experienced at 7 caregivers who completed meeting 4 (session 5) at home because family members had gone home. The family revealed that it felt more relaxed when doing therapy at home.

Family psychoeducation program in chronic diseases is very important because psychoeducation enables families to manage themselves against diseases experienced by a family member so that it will reduce burden disease and improve the quality of family life (Cooper, Booth, Fear & Gill, 2001). It was further written that family psychoeducation on chronic illness is a nursing intervention with the aim of providing families with information and skills regarding diet, physical activity and, stress management for self-care for system disorders experienced. Educational interventions include psychobehavioral methods, exercise, biofeedback, meditation and, psychosocial support.

The results showed that psychoeducation interventions can reduce

anxiety, depression, reduce the duration of acute disease episodes, improve quality of life, increase knowledge, improve the family atmosphere and increase adherence to therapy (Cartwright, 2007). Some other studies show that family psychoeducation therapy can reduce hospitalization by about 50% - 80% (Dixon et al 2001, Steinglass 1995 in Varcolis, 2006).

Family psychoeducation research related to families who have family members with heart disease shows that psychoeducation provided for 2 hours in 6 weeks to 57 family participants with family members experiencing stable angina showed improvement in symptoms of the disease in the client (McGillion, Michael., Judy., Bonnie., Sandra., Coyte., Graham 2008).

Sullivan et al (2009) explained that family psychoeducation provided for 2.25 hours for 8 weeks to 117 participants with family members experiencing CHF showed improvement in CHF symptoms experienced by clients in 12 months. Nurbani (2009) conducted 5-session family psychoeducation for 5 sessions on stroke for 45 participants (22 intervention participants) wrote that the intervention group experienced a significant decrease in anxiety (p-value 0.003). In line with Nurbani (2009), Rahayu (2011) explained that family psychoeducation of family members with leprosy significantly affected family psychosocial support, referring to the various results.

Psychoeducation can help caregivers in increasing family support, reducing family stress and improving family coping (Pargament, 1998; Kennedy, 2002 in Sullivan et al, 2009). The main purpose of family psychoeducation therapy is to exchange information about mental health care due to physical illnesses experienced, help family members understand the physical illnesses of family members such as symptoms, treatment needed to reduce symptoms and others (Varcolis, 2006). A family is a place of health and care behavior. In other words, the family has the function of promoting health and care for sick family members (Friedman, 2010).

Based on the results of the analysis it appears that social support after the intervention provided by family

psychoeducation increased. The results of this study are in line with the literature writing that in principle psychoeducation can help caregivers in increasing family support, reducing family stress and improving family coping (Pargament, 1998; Kennedy, 2002 in Sullivan et al, 2009). The main purpose of family psychoeducation therapy is to exchange information about mental health care due to physical illnesses experienced, help family members understand the physical illnesses of family members such as symptoms, treatment needed to reduce symptoms and others (Varcolis, 2006). Providing information to the client and family about the disease and the use of coping mechanisms that effectively reduce the client's tendency to relapse and the effect of the disease on other family members (Towsend, 2009).

A family is a group of people who are emotionally connected in togetherness to develop patterns of interaction and relationships (Carter & Mc Gldrick, 2005 in Boyd, 2008). Family participation in accompanying medication, diet, physical exercise and positive leisure time filling is a form of active participation in the successful management of CHF (Eversun-Rose & Lewis, 2005). As the main support system for CHF clients, families are expected to be able to fulfill 5 family functions and family duties in the health sector. In families with one member experiencing CHF, the health care function is needed by the client. Clients who have high support have the ability to undergo therapy well compared to clients who receive little social support (Gallagher, Luttik & Jaarsma, 2011).

In families, family members can be found to play an important role in caring for sick family members. A caregiver or family carer is someone in a family who provides care for other people who are sick, even usually the person is very dependent on his caregiver (Oyebode, 2003). The presence of family is very meaningful and makes feeling more comfortable for sick family members.

There is no significant relationship between age with the support of appraisal, instrumental, information and total social support (p-value > α). While for emotional support there is a relationship between age and family support (p-value 0.08 < α). However, when seen from $r = 0.36$ indicating a moderate relationship with a negative

pattern, the more age the lower the emotional support provided.

Individual perception related to the support received can protect individuals from stressors, strengthen self-efficacy and individual values. Individual perceptions about the support or social support received by individuals are very beneficial for the health and well-being of individuals (Ghazarian & Roche, 2010).

Social support is the availability of people who are trusted by individuals, on which individuals can depend, and feel cared for and valued as individuals. This means that social support provided by the family caregiver is an activity and effort physically, mentally and emotionally to be involved in caring for, responding to, and supporting patients (Chappell & Funk, 2011).

Older caregivers provide support without looking at it as a burden. Older people are more experienced in handling stresses from additional responsibilities. Older caregivers may have more time and experience to develop more effective coping skills (Mitchell & Knowlton, 2012).

The characteristics of the CHF caregiver in the study showed the average age of middle adults with average income above the Regional Minimum Wage of Bandung. There is no significant relationship between age with the support of appraisal, instrumental, information and total social support.

Based on the results of data analysis, it can be shown that there is no difference in age and income with the support of awards, instrumental, information and total social support due to caregivers in middle-aged adults. The Caregiver considers that providing social support is a responsibility for older family members. Moreover, with caregiver income above the minimum wage in the city of Bandung, the caregiver in socioeconomic status is not a problem in providing social support.

Emotional support there is a relationship between age ($r = 0.36$) indicating a moderate relationship with a negative pattern, the more age the lower the emotional support provided. The

existence of these results shows that emotional support is associated with age with a negative pattern, researchers assume that in the context of the local community's culture which has the view that older people will think of disease is something that must be accepted with increasing age.

There is no significant difference in the average family support provided by caregivers based on gender, educational background, occupation and caregiver relationships with patients. $p \text{ value} > \alpha$, meaning there is no relationship between sex, level of education, occupation and patient relationship with social support in caring for family members who experience CHF. Social support is a protective factor against blood pressure. People who have more social support don't get stressed easily. People who live under pressure and have a minimum social support system have much higher blood pressure. Poor cardiovascular health can occur in people who are exposed to stress and do not have social support. The family is important as a provider of social support. Families have a protective effect from stress experienced by family members and reduce the risk of hypertension. Family support can stabilize blood pressure in old age (Al-Kandari, 2011).

Family caregivers often experience stress not only by giving care assignments but also with a myriad of other difficulties in daily life. The caregiver can experience stress proliferation, where initial caregiving demands cause secondary stressors such as increased excessive roles or caregiver burden. The primary role of caregivers may not be primarily stressful, but their role can trigger secondary stress effects, such as lack of time and energy to engage in other social roles and feelings of appreciation (Mitchell & Knowlton, 2012).

The results showed no differences in gender, education level, employment and caregiver relationship with social support. According to the researchers, this is due to the fact that the caregiver is more female, the last education is more highly educated, the caregiver is more not working and the caregiver is the nuclear family of the patient. The opinion of researchers in accordance with the culture of the local community girls from nuclear families have the responsibility to care for parents and caregivers who were respondents in the study revealed that girls are

responsible for caring for parents who are sick. A high caregiver educational background makes it easy to receive information from the health team so that it helps the caregiver in providing information support. Researchers see that further research can be done by expanding the relationship between caregivers and patients

LIMITATIONS

It was difficult looking for the CHF client who was treated in a stable condition and the caregiver was a family member and lived in the same house as the client. These are common challenges to applied research in the community.

ETHICAL APPROVAL

The ethical committee of the Faculty of nursing science The University Of Indonesia approved the study protocols and all participants gave their written informed consent.

DISCLOSURE

The authors declare that they have no conflict of interest

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CONCLUSION

Family psychoeducation can be provided to families who have family members with CHF to increase family support in caring for these family members. As an effort to strengthen the results obtained, in addition to family psychoeducation can be given further therapy in the form of self-help groups that will facilitate CHF clients and families who are both experiencing similar problems so that the benefits of providing

therapy can be felt by the community on an ongoing basis. For the Hospital to develop mental health programs in hospitals that can facilitate the handling of psychosocial problems experienced by clients and families who are treated with CHF by involving the counseling department in the hospital.

REFERENCE

1. Al-Kandari, Y. Y. (2011). Relationship of strength of social support and frequency of social contact with hypertension and general health status among older adults in the mobile care Unit in Kuwait. *Journal of Cross-Cultural Gerontology*, 26(2), 175–187. <https://doi.org/10.1007/s10823-011-9139-9>
2. Boyd, M.A. (2008). *Psychiatric nursing contemporary practice*. Philadelphia: Lippincott
3. Brunner & Suddarth's. (2009). *Textbook of medical surgical nursing*. Philadelphia: Lippincott – Raven Publisher
4. Chappell, N. L., & Funk, L. M. (2011). Social support, caregiving, and aging. *Canadian Journal on Aging*, 30(3), 355–370. <https://doi.org/10.1017/S0714980811000316>
5. Cartwright, Mc (2007). Psychoeducation among caregivers of children receiving mental health services. *Journal of Consulting and Clinical Psychology*, 2, 336 – 343.
6. Cooper, Helen.,Katie Booth.,Simon Fear.,Geoff Gill (2001). Chronic disease patient education: lessons from meta-analyses. *Journal of education and counseling* 44 (2001) 107 – 117
7. Eversun-Rose, S.A & Lewis, T.T (2005). Psychology Factors and Cardiovascular Diseases. *Annual Review of Public Health*. 26 (32), 469
8. Friedman, M (2010). *Keperawatan keluarga teori dan praktek* 5th ed. Jakarta : EGC
9. Ghazarian, S. R., & Roche, K. M. (2010). Social support and low-income, urban mothers: Longitudinal associations with adolescent delinquency. *Journal of Youth and Adolescence*, 39(9), 1097–1108. <https://doi.org/10.1007/s10964-010-9544-3>
10. Hwang, Boyoung., Jill Houe-Esguivel., Kirsten E. Fleischmann., Nancy A. Stotts., Kathleen Dracup (2012). Family

- caregiving in pulmonary arterial hypertension. *Journal Heart and Lung* 41(1) 26 -36
11. Lubiantoro, U (2011). Prevalensi CHF di Indonesia. *Jurnal kardiologi Indonesia* 30 : 43-5
 12. Luttik, Marie Louise., I. Lesman-Leegte., Tiny Jaarsma (2009). Quality of life and depressive symptoms in heart failure patients and their partners: the impact of role and gender. *Journal of Cardiac Failure* vol 15 no 7
 13. McGillion, Michael H., Judy Watt-Watson., Bonnie Stevens., Sandra M. Lefort., Peter Coyte., Anthony Graham (2008). Randomized controlled trial of a psychoeducation program for the self-management of chronic cardiac pain. *Journal of Pain and Symptom Management* vol 36 no 2 August 2008
 14. Mitchell, M. M., & Knowlton, A. (2012). Caregiver role overload and network support in a sample of predominantly low-income, African-American caregivers of persons living with HIV/AIDS: A structural equation modeling analysis. *AIDS and Behavior*, 16(2), 278–287. <https://doi.org/10.1007/s10461-011-9886-1>
 15. Nurbani ., Keliat B.A., Yusron, N (2009). *Pengaruh psikoedukasi keluarga terhadap masalah psikososial ansietas dan beban keluarga (caregiver) dalam merawat pasien stroke di RSUPN Dr. Cipto Mangunkusumo Jakarta*. Tesis UI
 16. Pangastuti, D. (2009). *Asuhan keperawatan dengan gagal jantung kongestif di Rumah Sakit Roemani Semarang*. Semarang: Universitas Muhammadiyah Semarang.
 17. Rahajeng, Ekowati., Sulistyowati Tuminah (2009). Prevalensi hipertensi dan determinannya di Indonesia. *Majalah Kedokteran Indonesia*, volume 59, nomor 12 Desember 2009
 18. Rahayu, D.A., Hamid, A. Y., Mustikasari (2011). *Pengaruh psikoedukasi keluarga terhadap dukungan psikososial keluarga pada anggota keluarga dengan penyakit kusta di kabupaten Pekalongan*. Tesis UI
 19. Ratnasingam, George D. Bishop (2007). Social support schemas, trait anger and cardiovascular responses. *International Journal of psychophysiology* 63 (2007) 308-316
 20. Smith, O. R. F., Gidron, Y. Y., Kupper, N., Winter, J. B., & Denollet, J. (2009). Vital exhaustion in chronic heart failure: Symptom profiles and clinical outcome. *Journal of Psychosomatic Research*, 66, 195–201.
 21. Sullivan, Martin J., Laura Wood., Jennifer Terry., Jeff Brantley., Ann Charles., Vicky McGee., Diane Johnson (2009). The Support, Education, and Research in Chronic Heart Failure Study (SEARCH) : A mindfulness-based psychoeducational intervention improves depression and clinical symptoms in patients with chronic heart failure. *American Heart Journal* Volume 157, number 1, 85 - 89
 22. Washburn, SC Homberger C.A (2008). Heart failure management nurse educator guidelines for the management of heart failure. *The journal of continuing education nursing* 39C6
 23. WHO 2008, The world health report 2008 (2008, [http : www.who.int/whr/2008/whr08.en](http://www.who.int/whr/2008/whr08.en)
 24. Varcolis, E.M (2006). *Psychiatric nursing clinical guide: assesment tools and diagnosis*. Philadelphia W.B Saunders Co.
 25. Volz, A., Schmid, J. P., Zwahlen, M., Kohls, S., Saner, H., & Barth, J. (2011). Predictors of readmission and health related quality of life in patients with chronic heart failure: A comparison of different psychosocial aspects. *Journal of Behavioral Medicine*, 34(1), 13–22. <https://doi.org/10.1007/s10865-010-9282-8>