



Effect of education based on family-centered empowerment model on the quality of life of elderly patients with chronic obstructive pulmonary disease (COPD)

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General Note

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ABSTRACT

Chronic obstructive pulmonary disease (COPD) is one of the most commonly diagnosed diseases in the world, which impairs the quality of life of affected people. Maintaining and improving the quality of life of COPD patients require the serious support of their families. In this study, the effect of education based on family-centered empowerment model on the quality of life of elderly with chronic obstructive pulmonary disease (COPD) has been examined. This study is a non-randomized clinical trial, which was conducted in 2017. In this study, by convenience sampling method, 80 patients were selected from COPD patients who were visiting the lung clinics of Imam Khomeini and Shariati Hospitals in Tehran. Those who met the study's inclusion criteria were selected and then asked to complete the written consent form. In order to collect data, a researcher-made demographic questionnaire and a standard quality of life questionnaire (SF-36) were used after validity and reliability check. For data analysis, SPSS statistical software version 20 was used. In order to achieve the specific objectives of the study, inferential statistics and independent t-test, paired t-test and Chi-square test were used. Comparison of the quality of life of elderly patients with COPD before and after the education in the control and the intervention groups showed that, before the intervention, there was no significant difference between the two groups in terms of the mean score of quality of life, but after the intervention, the difference between the mean score of quality of life in the two groups was statistically significant ($P < 0.001$). In other words, the quality of life of patients in the intervention group had improved considerably after the intervention. The results of this study showed that, the implementation of a family-centered empowerment program improves the quality of life of elderly people with COPD. Therefore, administrators and planners of educational programs should consider the implementation of family-centered empowerment program in the training of elderly patients with chronic diseases.

Keywords: Family-centered empowerment model, quality of life, chronic obstructive pulmonary disease (COPD)

1. INTRODUCTION

Chronic diseases are now considered to be the main challenges of global health, as they account for two thirds of total mortality in the world. In the United States, chronic disease is the main cause of poor health, disability and mortality, and accounts for the biggest portion of health system's expenditure. About half of the adult population in the United States (50.9%) has at least one chronic disease (Bauer et al., 2014) and according to the latest report of World Health Organization (WHO) on the state of chronic diseases in 2010, chronic obstructive pulmonary disease (COPD) is one of the reasons for this high mortality rate (Schmidt et al., 2011). In the recent decade, with the advent of science and technology as well as changes in people's lifestyle, the nature of diseases and mortality rate have changed, so that, infectious and contagious diseases have been controlled and replaced by chronic diseases (Rafii et al., 2011).

Chronic obstructive pulmonary disease (COPD) is one of the most common chronic diseases (Nunes et al., 2009). Chronic illness is a medical condition or a health problem that is associated with symptoms and disabilities and requires long-term treatment (Zakerimoghadam et al., 2006). Chronic obstructive pulmonary disease (COPD) is progressive and irreversible disease, which the main characteristics of; air retention during the exhalation phase, chronic bronchitis and pulmonary emphysema (Steger et al., 2008). One of the important problems in COPD patients is their quality of life. While there are several definitions of quality of life, this concept is still widespread and ambiguous. The three main aspects of quality of life include physical, psychological and social aspects. In evaluating the quality of life, not only we examined the physical- psychological aspects, but also the mindset and the

individual's perceptions of their performance in everyday life. The quality of life, which is a major variable in clinical studies, has been shown to be an indicator of research effectiveness and quality of care (Kao et al., 2008).

Regarding the role of nurses, increasing the awareness of patients and their families and as a result, improving their quality of life, is one of the important nursing practices in the chronic diseases management, and it can be a difference between success and failure in adapting to illness (Avsar and Kasikci, 2010). The role of family in supporting and educating patient is one of the important and effective factors in the quality of education (Whelpton et al., 2015). Family, as the most important pillar of society, is responsible for providing proper and appropriate health care for patient (Kaakinen et al., 2014). Educating patients about health, life-satisfaction and self-care can be done with the help of families. Many of the health-related actions and beliefs of patients are based on the experiences and observations that they have made throughout their lives in the family environment. Therefore, as families significantly affect the health-related actions of patient, the role of family in patient education should be considered as an important factor, which regulates the health care (Falvo, 2010). Educating the family members about disease control and even prevention can be very helpful as there is a strong relationship between the family and the health of its members (Yoon and Kim, 2008). The family-centered empowerment model can be a good model for promoting health and improving the quality of life (Musick and Mare, 2006). Empowerment is the promotion of conscious efforts to take care of own self, families and communities in order to take responsibility for own health and maintaining health (Blissitt, 2011). Empowering the elderlies is a lifelong process and has a significant impact on their desire to return to life and society. Empowerment can be considered as the rehabilitation of individuals, which its purpose is to enable the elderlies to raise the potential of their life and survival (Monfared et al., 2015). In the rehabilitation of elderlies, families must be aware and active, and able to adapt to different situation (Dewing, 2003). Family-centered care model empowers elderlies and their families, and reduces their dependency on family. It also respects the family's choice, values, beliefs and culture. It is built based on family principles, and includes both families and elderlies in planning, implementing, and evaluating health care services (Davidson, 2009).

Since there is no treatments for COPD available, therapeutic measures are taken to control symptoms and avoid exposure to harmful environments. The physical and rehabilitational methods such as non-pharmacological treatment are used to control and improve symptoms in people with COPD (Zakerimoghadam et al., 2006).

In general, in pulmonary rehabilitation, patients learn to change their lifestyle by adhering to proper diet and medication regimen, walking, Pursed-Lip breathing and avoiding the risk factors (such as cigarette smoke and other environmental contaminations), which helps daily routine activity and improves quality of life (Jokar et al., 2014).

Studies suggest that, providing nursing skills based on empowerment thinking is considered the current needs of health systems. Since most research in the country is currently based on patient education, the role of family as an important collaborative resource in advancing treatment goals has not been considered adequately. Also, considering the widespread prevalence of chronic obstructive pulmonary disease (COPD), adherence to the treatment plan for controlling the disease, and improving the health of patients and their quality of life, are essential and vital factors that must be considered, given the need to create a good conditions for admission and adherence to the treatment plan as a value especially in chronic diseases.

Considering the family structure in our country and the aforementioned arguments, as well as researcher's experiences, most educational programs in the country are patient-centered or family education is considered as an independent process. Therefore, the role of the family as a social environment for learning to change behavior has been neglected. Thus, the need for further research on family-centered education in line with the principle of empowerment seems necessary. In this regard, this study was conducted to investigate the effect of education based on family-centered empowerment model on the quality of life of elderlies with chronic obstructive pulmonary disease (COPD) attending educational hospitals of Tehran.

2. MATERIALS AND METHODS

This study was a non-randomized clinical trial. A total of 80 samples were collected from all COPD patients attending the pulmonary clinics of Imam Khomeini and Shariati Hospitals in Tehran that met the inclusion criteria (patients and active members of the family were able to understand and speak Persian language, had no mental illness, and were over 60 years old). They were selected by convenience sampling, so that, COPD patients who attended the pulmonary clinic of Imam Khomeini Hospital were selected as the intervention group and COPD patients who attended the pulmonary clinic of Shariati Hospital were selected as the control group. To enter the research, a written consent was obtained from them.

Before the intervention, the questionnaires were completed for all patients and then, the education was carried out for the intervention group based on a family-centered empowerment model, which included perception of threat, problem solving, educational participation, and evaluation with the presence of a participant and at least one active member of his/her family. The training sessions were designed to cover 4 areas; drug regimen (related to the drug regimen), nutrition (related to the diet),

respiratory training (Pursed-Lip breathing with an emphasis on the use of motivational spirometer) and effective cough and daily activity according to the patients' condition. After analyzing the data, facilities, limitations, needs and weaknesses of the patients were identified and necessary changes were done to the empowerment training method (intervention was implemented as a family-centered empowerment education based on the mentioned steps, and in the control group, only physician's prescription was checked).

Three months after the intervention, the questionnaires were once again completed by the participants in both intervention and control groups via telephone or face-to-face at the clinic. To analyze the data, IBM SPSS Statistical software version 20 was used. In order to categorize and summarize the findings, descriptive statistics including absolute and relative frequency distribution tables, and distribution of central and dispersion indexes were used, and to reach the main objectives of the research, the inferential statistics, independent t-test, paired t-test and Chi-square test were used.

Intervention:

Educational sessions were conducted to implement an education based on family-centered empowerment model according to the stages of the model (threat perception, problem-solving, educational participation and evaluation) as follow:

Stage 1:

The first stage of the family-centered empowerment model was the threat perception, in which the patient, through training sessions and group discussions, improved his/her perceived sensitivity in relation to the disease and its control. The purpose of implementing this stage was to make sure the patient was aware of the dangers and effects of deficiencies in self-care and treatment. At this stage, we tried to increase the knowledge of patients about the areas of diet regimen, drug regimen, activity, and respiratory exercises by holding two educational sessions in two separate days in the form of lectures and discussion (questions and answers).

Stage 2:

Problem solving, which was done as a group work, was the second stage of the model. The purpose of this method was to increase self-efficacy, self-esteem and self-control of the patients. For this purpose, problem solving sessions were held in groups of 6 to 8 patients in two sessions for each group. At this stage, patients were faced with their problems and the process of solving the problem and interacted with each other under the indirect supervision of the researcher by citing objective examples of their own situation and what they should do to solve similar problem. In this way, they effectively collaborated with each other to choose solutions for their problems. They also discussed about the practical solutions in regard to daily activities, the use of different food groups and respiratory exercises, as well as drug regime.

Stage 3:

At this stage, booklets and pre-prepared educational pamphlets were provided for the participants and their family members. In fact at this stage (educational participation), the information was transferred to the active member of family by the patient. Also, a patient and an active member of his/her family were invited to a meeting, where the patient could transfer his/her previously learned points to his/her active family member under indirect guidance and supervision of the researcher. This method helped the researcher to evaluate and measure the amount of learning by the participant, and his/her active family member. In cases where there was a problem such as transfer of inaccurate information, the researcher immediately intervened and resolved by the problem.

Step 4:

This stage consisted of two evaluation steps, including the process and final evaluations. A process evaluation was conducted during the intervention process in all sessions with oral questions and a checklist related to the issues taught. Before the beginning of each educational process, the evaluation of the topics taught at the previous session was carried out and the necessary training was performed based on the evaluation results, in order to increase the knowledge of participant and his/her active family member (Vahedian et al., 2010).

The final evaluation, which was the result of the process evaluations, was done 3 months after the intervention using sf36 quality of life questionnaire to measure the effect of patient's empowerment on his/her knowledge and quality of life.

The educational content, including the diet and drug pamphlets, breathing exercises, and daily activities, were included in the family and patient booklet according to the needs and requirements of the patients. For the control group however, only the clinic's routine education including treatment prescription was carried out. It should be noted that, educational content was given to 12

professors of Medical-Surgical Nursing Department of Nursing & Midwifery School, Tehran University of Medical Sciences for approval.

Ethical considerations:

After obtaining permission from the Ethics Committee of Tehran University of Medical Sciences (IR.TUMS.VCR.REC.1395.73), the researcher attended the research environment, and after explaining the aims of the research, how to complete the questionnaire, confidentiality of information, and obtaining the informed consent, began to collect the data.

The characteristics of data collection tools:

1. Patient's personal information questionnaire, which was consisted of two parts:

A) The first section, which included questions about the patient's personal information, and the second part, which included information on chronic obstructive pulmonary disease.

B) Quality of Life Questionnaire (SF-36): The most common and comprehensive standard tool for quality of life measurement is the 36-item SF questionnaire, which serves as a standard measure of health outcomes at the international level. The SF-36 questionnaire is classified into three levels as follow: 1) Questions, 2) Eight scale that each of them is a combination of 2 to 10 questions (physical performance, physical limitation, physical pain, general health, vitality, social function, mental problems, and mental health), and 3) Two brief measures that are derived from the integration of the scale as follow: 1) Physical health (physical function + physical limitation + physical pain + general health), and 2) Mental health (social function + mental problems + mental health + vitality). The score of each scale varied from 0 to 100 with 0 showing the worst and 100 showing the best position on the scale. Montazeri et al (2005) examined the reliability and validity of SF-36 questionnaire. The reliability of the tool was evaluated using statistical analysis of internal consistency and validity test through comparison of known groups and convergence validity. Internal consistency analysis showed that, the standard reliability coefficients of the questionnaire ranged from 0.77 to 0.90.

Method of calculating sample size and number:

Since, similar and reliable study to show the quality of life of COPD patients was not found, the following formula was used to estimate the maximum sample size and the quality of life of COPD patients by choosing $p_0 = 0.5$ and anticipating an increase after the intervention to the level of $p_1 = 0.8$, and also considering $\alpha = 0.05$ (0.95 confidence level) and $\beta = 0.2$ (0.80 test power).

$$N = \frac{2(z_{1-\alpha/2} + z_{1-\beta})^2(p \cdot q)}{(p_0 - p_1)^2} = \frac{2(1.96 + 0.842)^2(0/65)(0/35)}{(0/5 - 0/8)^2} \cong 40$$

$n = 40$ subjects were assigned to each group

3. RESULTS

The demographic information of the two groups (intervention and control) is presented in Table 1. The results showed that, there was no significant difference between the two groups in terms of age, sex, marital status, occupation, level of education, people living with the patient, income level, health insurance, smoking status, time of diagnosis, main source of information, and increase activity with shortness of breath. In other words, the two groups were homogeneous.

Table 1 Personal and disease characteristics of the samples

Variable		Intervention		Control		Test result
		Quantity	Percentage	Quantity	Percentage	
Gender	Male	20	50	21	52.5	Pearson chi-square $\chi^2 = 0.050$ df=1 P=0.823
	Female	20	50	19	47.5	
Age (year)	Below 60	3	7.5	8	20	Independent T test T=1.584 df=78
	61-70	28	70	29	72.5	
	71-80	9	22.5	2	5	

	81 and above	0	0	1	2.5	P=0.117
Marital status	Single	2	5	2	5	Fishers Exact Test =1.142 P=0.900
	Married	23	57.5	24	60	
	Divorced	3	7.5	1	2.5	
	Widow	12	30	13	32.5	
Education	Illiterate	6	15	5	12.5	Pearson chi-square $\chi^2 = 4.663$ Df=4 P= 0.324
	Primary	5	12.5	6	15	
	Secondary	13	32.5	9	22.5	
	High school	14	35	12	30	
	University	2	5	8	20	
People who live with the patient	Alone	7	17.5	3	7.5	Fishers Exact Test = 2.835 P= 0.611
	With spouse and children	19	47.5	22	55	
	With children	8	20	7	17.5	
	With parents	1	2.5	3	7.5	
	With others	5	12.5	5	12.5	
Income level in terms of adequacy	Adequate	14	35	12	30	Pearson chi-square $\chi^2 = 3.836$ df=2 P= 0.147
	Almost adequate	13	32.5	21	52.5	
	Inadequate	13	32.5	7	17.5	
Health insurance status	Have	25	70	34	85	Pearson chi-square $\chi^2 = 2.581$ Df=1 P= 0.108
	Do not have	12	30	6	15	
Smoking	Smoker	6	15	5	12.5	Pearson chi-square $\chi^2 = 0.251$ Df=2 P= 0.882
	Non-smoker	28	70	30	75	
	Have quit	6	15	5	12.5	
Time of diagnosis (year)	Less than 2	19	47.5	16	40	Fishers Exact Test =2.304 P=0.528
	2-5	12	30	16	40	
	5-9	6	15	3	7.5	
	Over 10	3	7.5	5	12.5	
Source of information	Physician	39	97.5	34	85	Fishers Exact Test =6.445 P=0.039
	Nurse	1	2.5	0	0	
	Personal study	0	0	1	2.5	
	Training	0	0	2	5	
	Others	0	0	3	7.5	
Increase activity with shortness of breath	Yes	39	97.5	34	85	Fishers Exact Test =4.305 P=0.108
	No	1	2.5	6	15	

Table 2 Comparison of the aspects of quality of life of elderly patients with COPD before and three months after the training in the intervention Group

Stage Aspects of quality of life	Before the training	After the training	Results of paired t-test
	Mean ± standard deviation	Mean ± standard deviation	
Physical performance	57.75±30.63	58.12±30.58	t=0.101 P=0.920
Physical limitation	63.12±40.81	48.75±45.27	t=2.29 P=0.27
Physical pain	52.77±19.12	45.83±20.92	t=3.053 P=0.004
Perception of general health	17.13±38.62	35.75±16.35	t=1.84 P=0.066
Energy and vitality	51.62±14.33	49.62±11.28	t=1.243 P=0.221
Social performance	55.93 ±18.55	45.93±18.64	t=3.937 P<0.000
Emotional limitation	60.83±43.94	47.50±47.67	t=2.013 P=0.051
Mental health	53.60±14.14	51.00±13.73	t=1.819 P=0.077
Total quality of life	51.90±16.59	48.27±15.10	t=2.428 P=0.020

The results of paired t- test showed a statistical significant relationship between the scores of aspects of quality of life in terms of physical pain (P = 0.004), social function (P< 0.000) and the total quality of life (P = 0.020), and no statistical significant relationship was found between other aspects of the quality of life. Also, the comparison of the mean and standard deviation of total quality of life score showed that, the mean and standard deviation of total quality of life score was reduced (before the intervention was 16.59 ± 51.90, and after routine intervention, it became 15.10 ± 48.27).

Table 3 Comparison of aspects of quality of life before and after the intervention in the intervention group

Stage Aspects of quality of life	Before the training	After the training	Results of paired t-test
	Mean ± standard deviation	Mean ± standard deviation	
Physical performance	58.12±29.23	71.62±28.17	t= -4.359 P<0.000
Physical limitation	63.75±43.46	73.12±40.97	t=-2.360 P=0.023
Physical pain	55.55±26.14	61.11±22.22	t=-2.360 P=0.023
Perception of general health	41.37±22.12	41.00±20.45	t=0.207 P=0.837

Energy and vitality	56.87±16.70	60.12±12.53	t=-1.867 P=0.069
Social performance	57.50±23.30	62.81±17.09	t=-1.879 P=0.068
Emotional limitation	65.00±45.88	75.00±42.53	t=-1.740 P=0.090
Mental health	59.70±14.94	62.90±12.77	t=-1.854 P=0.071
Total quality of life	55.32±19.49	60.52±16.56	t=-3.635 P=0.001

The results of paired t-test showed a statistical significant relationship between the scores of aspects of quality of life in terms of physical performance ($P < 0.000$), physical limitation ($P = 0.023$), physical pain ($P = 0.023$), and total quality of life ($P = 0.001$), and no statistical significant relationship was found between other aspects of quality of life. Also, comparison of mean and standard deviation of total quality of life score (before intervention 55.39 ± 19.49 and after intervention 16.56 ± 60.52) in the intervention group indicated an increase in total quality of life score.

Tables 4 Comparing the quality of life of elderly patients with COPD before and after the training in the control and intervention groups

Quality of life	Group	Before the training		After the training		Results of t-test
		Mean	Standard deviation	Mean	Standard deviation	
	Control	51.90	16.59	48.27	15.10	T= -0.844 P=0.401
	Intervention	55.32	19.49	60.52	16.56	T= -3.456 P=0.001

Comparison of the mean and standard deviation of quality of life of elderly patients with COPD before and after education in the control and intervention groups showed no statistically significant difference between the mean score of quality of life in the two groups before the intervention, so the two groups were homogeneous in terms of quality of life. The results of independent t-test showed a statistically significant difference between the mean score of quality of life in the two groups after the intervention ($P < .001$). By comparing the mean score of the two groups, we can see that, the mean score of quality of life in the intervention group has been significantly increased.

4. DISCUSSION

In this research, the effect of family-centered empowerment program on the quality of life in elderly people with COPD was investigated. The findings of this study included the results of a survey of 80 samples, which has been analyzed in this section.

Results related to the individual characteristics of the study samples showed no statistical significant difference between the control and intervention groups in terms of age, gender, marital status, occupation, educational level, health insurance, level of income, and BMI including frequency distribution of gender, as well as marital status, economic status, having support or living in loneliness, number of family members, history of smoking (cigarette or hookah), number of hospital admissions due to chronic obstructive pulmonary disease, time of disease diagnosis, source of information, how the disease was diagnosed, and having shortness of breath with activity. In other words, the two groups were homogeneous.

Comparing the quality of life of elderly patients with COPD before and three months after the intervention in the control group showed that, the mean and standard deviation of total quality of life score has decreased (before the intervention 51.59 ± 16.59 and after the routine intervention 48.27 ± 15.10). Results of a study by Khezri et al., (2016) on the effect of self-management

empowerment model on the quality of life of the elderly people with hypertension are consistent with the finding of present study as the mean score of quality of life in the control group showed no changes after one month follow-up.

By comparing the quality of life of elderly patients with COPD before and three months after the intervention in the intervention group, the mean and standard deviation of total quality of life score showed a higher quality of life in these individuals (before the intervention was 55.32 ± 19.49 and increased to 60.52 ± 16.56 after the intervention). In line with the present study, the results of a study by Razazan et al., (2014) on the effect of Self-Management Empowerment Model on the quality of life of adolescents and young people with major thalassemia showed that, the implementation of self-management empowerment model increased the quality of life score in all aspects of quality of life, and also the mean and standard deviation of total quality of life score showed a significant difference before and after the intervention from the participants' point of view. Participants in the research had a significant difference after the training compared to before. The results of present study showed that, the overall quality of life of elderly people with COPD three months after the training based on self-management empowerment model has increased in the intervention group. The results of different studies are consistent with the finding of present study as they show the importance of using this model to improve the quality of life of patients with other chronic diseases (Zarandi et al., 2016; Teymouri et al., 2011; Mahmodi et al., 2012).

Comparing the quality of life of elderly patients with COPD before and after the training in the control and the intervention groups showed no significant difference between the mean score of quality of life in the two groups before the intervention. Therefore, the two groups were homogeneous in terms of quality of life. The result of independent t-test showed a significant difference between the mean score of quality of life in the two groups after the intervention ($P < 0.001$). In other words, the mean score of quality of life in the intervention group had increased significantly. In a study by Mich, et al (2003) on the effect of self-care education on quality of life in patients with chronic heart failure, the results showed that, self-care behaviors gradually increased 1, 2 and 3 months after the intervention in the intervention group, so that, 3 months after the training, the patients in the intervention group had a better quality of life than the patients in the control group. The results of other studies also confirm the results of present study. In a prospective study by Alikari et al., (2015), an educational program in the form of counseling, pamphlets and educational films had a positive effect on the quality of life of patients undergoing hemodialysis. In line with this study, a study by Shams et al., (2016) entitled: "The Effect of Self-care Curriculum on Quality of Life in Patients with Diabetes attending the Urmia Diabetes Association", found that, self-care education in people with diabetes improved their quality of life particularly, the physical health aspect. Results of a randomized controlled trial of a family-centered self-management program to improve self-efficacy, control of blood glucose and quality of life among Thai people with type 2 diabetes that was conducted by Wichit et al (2017), are also in line with the findings of present study, as the implementation of program led to improved quality of life in the intervention group, but there was no improvement in the control group. The results of Raheb et al (2018) also demonstrated that the self-care skills training program based on empowerment model had an effect on quality of life among patients undergoing hemodialysis. Moreover, Self-care education interventions performed by Boomdar Deir, Ahadi, Finlayson, has increased the quality of life in the intervention group consisting of MS patients, which is in line with the findings of present study (Bombardier et al., 2008; Ehde et al., 2015; Finlayson et al., 2011; Zhang et al., 2018).

5. CONCLUSION

The results of this study showed that, the implementation of a family-centered empowerment program improved the quality of life of elderly people with COPD. The findings also showed that, the quality of life of patients in the control group who did not receive the empowerment program was at a lower level compared to the intervention group, and this highlighted the lack of a complete and accessible training resource for these patients. Therefore, administrators and planners of educational programs/projects should consider the implementation of family-centered empowerment programs in the training of elderly patients with chronic diseases, especially COPD, chronic heart disease, and so on.

Due to the importance of implementing this method as an effective educational method that can improve the quality of life of patients, nursing managers should educate nurses and facilitate the implementation of such programs in clinical settings.

FUTURE ISSUES

The researchers are recommended to take into account the importance of quality of life and conduct further studies to assess the impact of other educational methods on the quality of life of patients with chronic diseases. It is also suggested that, in subsequent studies, the effect of family-centered empowerment education on the quality of life of elderly people with chronic obstructive pulmonary disease should be investigated over a longer period of time in order to examine its long-term effects.

LIMITATION

Inability to control some of the influential variables, such as the identity of subjects, their social and psychological status, etc, was among the limitations of this study.

DISCLOSURE STATEMENT

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