



Effectiveness of nurse led intervention on Quality of Life (QoL) among patients with Tuberculosis

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ABSTRACT

Each year about 2.2 million people develop TB in India and an estimated 220,000 die from the disease. According to the World Health Organization (WHO), it's the most deadly infectious disease in the world, killing 1.5 million people in 2014. TB is most common in developing countries. Tuberculosis is usually preventable and curable under the right conditions. To assess the effectiveness of the nurse-led intervention on Quality of Life (QoL) among patients with tuberculosis. A Quasi-experimental study with time series design with a comparison group was conducted in two selected Hospitals of Kanpur 50 active tuberculosis patients(25 experimental and 25 in the comparison group) formed the sample for the study The researcher used structured questionnaire to elicit demographic data and WHO QoL BREF scale to assess Quality of life. The nurse-led interventions were individualized teaching on tuberculosis to patients and family education in the prevention and management of tuberculosis. To experimental group the comparison group followed ward routine, the post-intervention and assessment of the quality of life were done at 15 days and 60 days for both the group. There was a significant difference in the quality of life in 15 days and 60 days at $p < .001$ level The Mean difference was high in all domains of quality of life in the experimental group except physical domain. The highest mean difference in QoL was found in environmental health and the lowest in physical domain with 95% CI after an intervention that infers the nurse-led intervention was effective whereas the Mean difference in all domains in the comparison group was very low. The Association of pre-intervention level of QoL among subjects with their selected clinical characteristics in the comparison group showed that extension of tuberculosis and the zone affected by tuberculosis in the social domain and symptoms of tuberculosis in environmental the domain is influenced at $p < .05$ level of significance There was no significant association of QoL with demographic variables. The intervention was effective in improving QoL among Tuberculosis patients.

Keywords— *Quality of Life (QoL), Tuberculosis (TB), WHO BREF, QoL scale*

1. BACKGROUND OF THE STUDY

Tuberculosis (TB is one of the greatest public health problems in the world.) is one of the most important causes of mortality and morbidity in developing countries. It accounts for 25% of all preventable deaths. Treatment of TB is considered a cost-effective health intervention in developing countries; prompt diagnosis and successful treatment shorten the chain of transmission. Development of serious complications such as the emergence of drug resistance has made TB control incredibly difficult in many settings. So the World Health Organization insists to set targets to half the world prevalence and reverse the incidence of TB by 2015 and to eliminate TB as a public health threat by 2050.

Nurses make up by far the largest group of health care workers in any part of the world and as in most areas of health care they often undertake the bulk of the work in TB control¹ (Akin S, et al., 2011) Health education plays an important role in change of patients knowledge and attitude regarding tuberculosis. Since the treatment of TB is considered a cost-effective health intervention in developing countries; prompt diagnosis and successful treatment regular follow up care can shorten the chain of transmission. The researcher during his clinical experience had observed that inadequate regular nursing interventions are planned and conducted for patients with Tuberculosis. The present study is very much nursing focused and has many nursing implications.

2. NEED FOR THE STUDY

In TB control, poor treatment adherence is a major cause of relapse and drug resistance. Nurses have a critical role in supporting patients in TB treatment process. Yet, very little research has been done to inform policymakers and practitioners on nurses' experiences of treatment adherence among patients with TB. The Sustainable Development Goals (SDGs) for 2030 were adopted by the United Nations in 2015. One of the targets is to end the global TB epidemic. The WHO End TB Strategy, approved by the World Health Assembly in 2014, calls for a 90% reduction in TB deaths and an 80% reduction in the TB incidence rate by 2030, compared with 2015. ((Global Tuberculosis Report 2016 from the World Health Organization) Nurses are the door to the

community and community health nurses can contribute to the achievement of SDG for Tuberculosis by case finding, case holding, care of tuberculosis patients in the family, educate for drug compliance, counsel for misconception regarding tuberculosis, and help to improve quality of life of patients.

Health education continues to be one of the most important strategies in the fight against TB. Efforts are directed at nurses, all healthcare workers and patients to make them more informed and aware of all aspects of TB disease, its treatment and the basic rules to prevent the spread of infection to others in the community. Health education plays a key role in encouraging patients to seek a diagnosis for TB and to adhere to the treatment.

3. OBJECTIVES

- Assess the pre-intervention level of QoL among patients with tuberculosis among experimental and comparison group.
- Compare the pre and post-interventional level of QoL among the experimental group.
- Compare the post-interventional level of QoL between experimental and comparison group.
- Associate the post-interventional level of QoL with selected demographic variables of experimental and comparison group.

4. HYPOTHESES

RH₁: There will be a significant difference in QoL between the pre and post interventional score among the experimental group

RH₂: There will be a significant difference in post-interventional QoL score between experimental and comparison group

RH₃: There will be a significant association of post-interventional health-related quality of life score with selected demographic variables of experimental and comparison group

5. REVIEW OF RELATED LITERATURE

Sudeepa Khana et al., (2017) carried out a study to develop an intervention to improve psychosocial well-being for MDR-TB patients in Nepal. The finding revealed the negative impacts of MDR-TB treatment on mental health, with greater impacts, felt among those with limited social and financial support, predominantly married women. The findings from this study emphasize the need for tailored psycho-social education and support

Cheng-Ting Li, Kuei-Hui Chu, Bereka Reiher, Takeieta Kienene, and Li-Yin Chien (2017) carried out a cross-sectional survey to examine the health-related quality of life and related factors among patients with smear-positive and smear-negative pulmonary tuberculosis within 2 years after completion of directly observed treatment, short course (DOTS), and to compare their HRQoL with a comparison group of community-dwelling individuals without TB in South Tarawa,. The study subjects were 206 pulmonary TB patients who had completed DOTS and 214 individuals without TB, HRQoL was measured using the Short Form (36) Health Survey (SF-36). The study observed that the patients with TB had a statistically significantly higher physical component summary (PCS) score and mental component summary (MCS) score on the SF-36 than the comparison group after adjustment for background characteristics. Multiple linear regression showed that older age and presence of persistent symptoms after completion of DOTS were related to a lower PCS score in TB patients. Patients who were smear-positive before DOTS treatment had higher MCS scores than those who were smear-negative.

Shrishail S Patil (2016) conducted a follow-up study to evaluate the impact of tuberculosis treatment on health-related quality of life (HRQoL) of patients with active and inactive tuberculosis by evolving HRQoL questionnaire (SF-36v2). A total of 70 patients (56 men and 14 women) diagnosed with tuberculosis, Raichur for a period of 6 months. The HRQoL of TB patients was assessed in three phases: at the onset of treatment, at one month (middle of intensive phase) and two months (end of intensive phase), after the initiation of anti-tuberculosis therapy and individualized teaching. The study concluded that The HRQoL improved with the treatment, the scores on component summary measures revealed the improvement of both physical and mental health among study patients at the end of the intensive phase.

6. METHODOLOGY

The study was conducted from 1st January to 31st March 2018. A Quasi-experimental time series pre and post-test design with a comparison group were used as research design with QoL were dependent and Nurse-led intervention was independent variables 50 Patients who met the inclusive criteria were selected by purposive sampling (25 each in experimental and comparison group) were the sample. A structured questionnaire to elicit demographic data, WHO QoL BREF scale to assess the QOL of subjects were the tool for data collection The interventions were Nurse-led intervention comprising individualized teaching and family education on Tuberculosis.

The study was conducted from Jan 1st to 31st March 2018. The ethical consideration was kept in mind .and interview questionnaire was administered to collect demographic data. Clinical data were elicited from patients.QOL in Hindi version was explained to patients in both the group and asked the patients to circle the appropriate response. Individualized education was given to patients of the experimental group and Family education using LCD projector was conducted 4-5 members including bystanders of the experimental group The same procedure was repeated on 15th day and 60th day A log was maintained to ensure and monitor the care and drug adherence. A staff nurse was trained Post-intervention quality of life was assessed on 15th and 60th day. The comparison group was followed ward routine and their quality of life was assessed on 15th and 60th day.

The comparison group was given individualized education and family education after 8 weeks.

7. RESULTS AND DISCUSSION

7.1 Assessment of demographic profile

Among the subjects, 19(76%) were 36-45 years in both the group In terms of gender, 18(72%) in the experimental group and 17 (68%) in the comparison group were males. With regards to educational status 12(48%) were higher secondary and graduates and

above in experimental group whereas in comparison group 14(56%) were passed higher secondary school.13(42%) in experimental group and 17 (68%) in comparison group had the income of 15001 to 20,000 per month 15(60%) in experimental group and 13(52%) in comparison group had no other sources of income. In both, the group 14(56%) and 16(64%) in the comparison group belonged to the joint family. 17(68%) in the experimental group and 22(88%) in the comparison group were married. Regarding overcrowding 15(60%) in experimental and 24 (96%) expressed overcrowding in house. In both, the group 22(88%) and 24 (96%) in the experimental and comparison group had 3-5 members in the family. Regarding the source of information about tuberculosis 15(60%) and 16(64%) in experimental and comparison group obtained from mass media 7 (28%) in the experimental group and 11(44%) in the comparison group were new admissions. In both, the group 14(56%) belonged to Category number 1 Continuous phase 8(32%) in the experimental group and 11(44%) in the comparison group had the symptom of 15(60%) in experimental and 17(68%) in the comparison group had a moderate extension. With regards to Zone 14(56%) in experimental and 10(40%) had multiple sites affected. 24(96%) in experimental and 21(84%) in the comparison group were Sputum positive patients.

7.2 Pre Intervention QoL among subjects of experimental and comparison group

Table 1: Comparison of the domain-wise pre-intervention level of quality of life domain wise among subjects of experimental and comparison group, N=50

Domain	Experimental Group (n = 25)		Comparison Group (n = 25)		Student Independent 't' test
	Mean	S.D	Mean	S.D	
Physical	38.72	7.39	40.64	4.28	t = 1.124 p = 0.268, N.S
Psychological	31.80	9.13	26.04	6.42	t = 2.579 p = 0.013, S**
Social	23.04	13.65	18.40	9.64	t = 1.388 p = 0.172, N.S
Environmental	21.40	11.02	19.36	4.53	t = 0.856 p = 0.398, N.S

**p<0.01, S – Significant, N.S – Not Significant

As per the above table student independent 't' test shows there was no significant difference in all domains except psychological domain at p<0.001 level of significance

7.3 Comparison of Post Intervention QoL Between experimental and comparison group

Table 2: Frequency and percentage distribution and level of post-intervention level of QoL among Tuberculosis patients in experimental and comparison group (QoL Item 1), N = 50(25+25)

Quality of life	Level of Quality of life Item 1	Experimental group n=25		Comparison group n=25		Chi-square value
		No.	%	No.	%	
Post test II (60 days)	Very poor	0	0	5	20.0	$\chi^2=42.889$ d.f=3 p = 0.000 S***
	Poor	0	0	18	72.0	
	Neither poor nor good	16	64.0	2	8.0	
	Good	9	36.0	0	0	
	Very good	-	-	-	-	

***p<0.001, S – Significant

On Chi-square analysis, there was a high statistical difference in the quality of life in the post-test between experimental and comparison group at p<0.001 level as per the above table

Table 3: Frequency and percentage distribution of post-intervention level of satisfaction regarding health status among Tuberculosis patients in experimental and comparison group (QoL Item 2), N = 50(25+25)

Satisfaction regarding health status	Quality of life item 1	Experimental group n=25		Comparison group n=25		Chi-square value p-value
		No.	%	No.	%	
Post-test II (60 days)	Very dissatisfied	0	0	6	24.0	$\chi^2=44.000$ d.f=3 p = 0.000 S***
	Dissatisfied	0	0	17	68.0	
	Neither satisfied nor dissatisfied	6	24.0	2	8.0	
	Satisfied	19	76.0	0	0	

***p<0.001, S – Significant

On Chi-square analysis, there was a high statistical difference in Satisfaction regarding health status in the post-test between the experimental and comparison group at p<0.001 level as per the above table.

Table 4: Comparison of post-intervention Mean and S.D of QOL score of subjects between experimental and comparison group, N = 50

Domain	Post Intervention (After 60 days)	Experimental Group (n=25)		Comparison Group (n=25)		Mean Difference	Students' Independent 't' test
		Mean	S.D	Mean	S.D		
Physical	Post Intervention II	54.76	4.65	39.16	4.19	15.60	t = 12.464 p = 0.000, S***
Psychological	Post Intervention II	66.40	4.91	23.56	6.40	42.84	t = 26.567 p = 0.000, S***
Social	Post Intervention II	63.00	5.14	15.88	3.85	47.12	t = 36.634 p = 0.000, S***
Environmental	Post Intervention II	63.36	3.36	16.52	4.20	46.84	t = 43.552 p = 0.000, S***

***p<0.001, S – Significant

On analyzing with students independent 't' test, there was a highly significant difference in the quality of life between experimental and comparison group at p<0.001 level in all domains as shown in table 4 and figure 1.

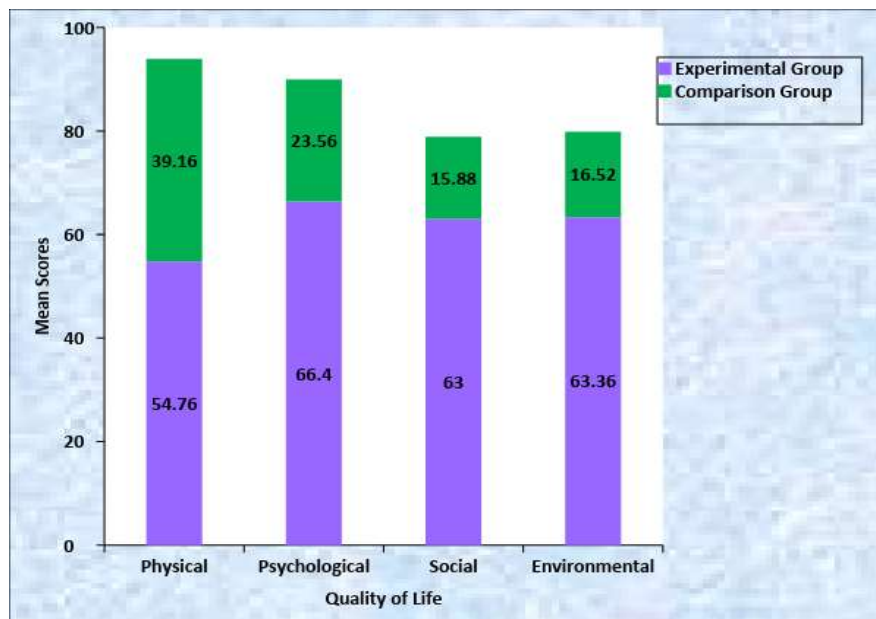


Fig. 1: Comparison of post-intervention II mean score of QOL of subjects between experimental and comparison group.

7.4 Comparison of Pre and Post Intervention QoL among experimental group

Table 5: Comparison of pre and post intervention (1) Domain wise QoL among subjects in the experimental group, N = 50

Group	Domain	Pre-test		Post-test I		Paired 't' test	
		Mean	S.D	Mean	S.D	t-value	P
Experimental Group n=25	Physical	38.72	7.39	49.36	4.81	6.417	0.000*** (S)
	Psychological	31.80	9.13	49.84	3.79	8.882	0.000*** (S)
	Social	23.04	13.65	45.16	6.81	7.659	0.000*** (S)
	Environment	21.40	11.02	44.84	3.06	9.867	0.000*** (S)
	Overall	28.72	8.75	47.16	2.44	10.473	0.000*** (S)

***p<0.001, S – Significant, N.S – Not Significant

On analysis paired 't' shows a highly significant difference in the quality of life in all domain between pre and post intervention 1 (after 15 days) among an experimental group of patients.

Table 6: Comparison of post-intervention I, II level of domain wise QoL among subjects in the experimental group, N = 50

Group	Domain	Post-test I		Post-test II		Paired 't' test	
		Mean	S.D	Mean	S.D	t-value	P
Experimental Group n=25	Physical	49.36	4.81	54.76	4.65	4.266	0.000*** (S)
	Psychological	49.84	3.79	66.40	4.91	12.688	0.000*** (S)
	Social	45.16	6.81	63.00	5.15	9.137	0.000*** (S)
	Environment	44.84	3.06	63.36	3.35	19.517	0.000*** (S)
	Overall	47.16	2.44	61.68	1.68	20.458	0.000*** (S)

***p<0.001, S – Significant, N.S – Not Significant

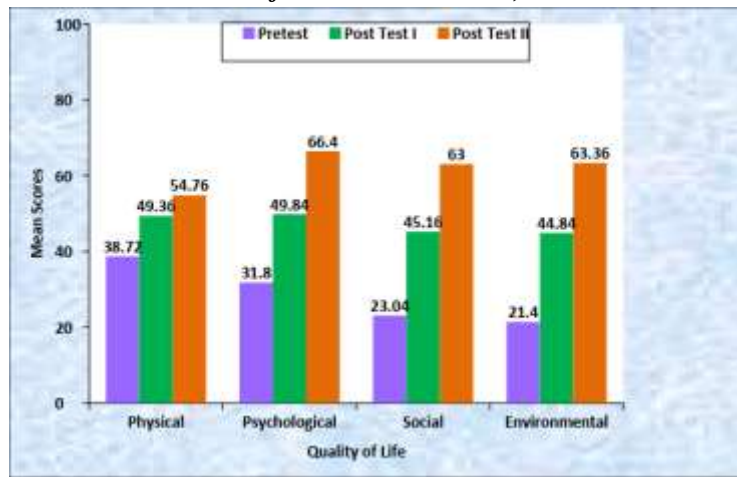


Fig. 2: Comparison of pre and post intervention of domain-wise QoL among subjects in the experimental group

On analysis. Paired ‘t’ shows in all domains there was a highly significant difference between pre and post 1 and post 2 interventional level quality of life at $p < 0.001$ level as table 6 and figure 2.

Table 7: Comparison of pre and post intervention of domain-wise QoL among subjects in the experimental group, N = 50

Group	Domain	Pretest		Post-test I		Post-test II		One-way Repeated Measures ANOVA	
		Mean	S.D	Mean	S.D	Mean	S.D	F-value	P
Experimental Group n=25	Physical	38.72	7.39	49.36	4.81	54.76	4.65	56.625	0.000*** (S)
	Psychological	31.80	9.13	49.84	3.79	66.40	4.91	158.798	0.000*** (S)
	Social	23.04	13.65	45.16	6.81	63.00	5.15	116.859	0.000*** (S)
	Environment	21.40	11.02	44.84	3.06	63.36	3.35	228.471	0.000*** (S)
	Overall	28.72	8.75	47.16	2.44	61.68	1.68	236.630	0.000*** (S)

*** $p < 0.001$, S – Significant, N.S – Not Significant

One way repeated measures ANOVA test F value 236.630 (Overall) with a p-value 0.001 that is the highly significant difference as per the above table.

Table 8: Comparison of pre and post intervention of domain-wise QoL among subjects in experimental and comparison group, N = 50

Group	Domain	Pre-test		Post-test II		Paired ‘t’ test	
		Mean	S.D	Mean	S.D	t-value	P
Experimental Group n=25	Physical	38.72	7.39	54.76	4.65	9.765	0.000*** (S)
	Psychological	31.80	9.13	66.40	4.91	14.771	0.000*** (S)
	Social	23.04	13.65	63.00	5.15	13.770	0.000*** (S)
	Environment	21.40	11.02	63.36	3.35	16.638	0.000*** (S)
	Overall	28.72	8.75	61.68	1.68	18.103	0.000*** (S)
Comparison Group (n=25)	Physical	40.64	4.28	39.16	4.19	1.190	0.246 (N.S)
	Psychological	26.04	6.42	23.56	6.40	1.486	0.130 (N.S)
	Social	18.40	9.64	15.88	3.85	1.241	0.226 (N.S)
	Environment	19.36	4.53	16.52	4.20	2.183	0.039* (S)
	Overall	26.08	3.43	23.64	1.95	2.756	0.011** (S)

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, S – Significant, N.S – Not Significant

As per the above table. paired ‘t’ test shows there was a highly statistical difference observed between pre and post intervention(in an experimental group whereas there was no significant difference observed in comparison group except in environmental domain that shows a low significance at $p < 0.05$ level.

Table 9: Effectiveness of nurse-led intervention on QOL in the experimental group, N = 50(25+25)

Group	Max – Min Score	Pretest		Post Test II		Mean Difference with 95% CI
		Mean	S.D	Mean	S.D	
Physical	1 – 100	38.72	7.39	54.76	4.65	16.04 (12.65–19.43)
Psychological	1 – 100	31.80	9.13	66.40	4.91	34.6 (29.76–39.43)
Social	1 – 100	23.04	13.65	63.00	5.15	39.96 (33.97-45.95)
Environmental	1 – 100	21.40	11.02	63.36	3.35	41.96 (37.31-46.61)

Table 9 shows the Effectiveness of nurse-led intervention on QOL in the experimental group. The mean difference was high in all domains of quality of life in the experimental group except physical domain. The highest mean difference in QoL was found in

environmental health and the lowest in physical domain with 95% CI the finding is consistent within **S et al ., (2004)** carried out a qualitative study to assess the effect of the community-based psychosocial intervention in 2004 at Lima on 1000 MDR tuberculosis patients. The finding revealed that an integrated approach with psychosocial economical and medical support in controlling MDR TB patients was extremely effective at 0.001 level of significance. Hence the H₂ stated earlier was accepted.

Table 10: Effectiveness of nurse-led intervention on QOL in the comparison group, N = 50(25+25)

Group	Max – Min Score	Pretest		Post Test II		Mean Difference with 95% CI
		Mean	S.D	Mean	S.D	
Physical	1 – 100	40.64	4.28	39.16	4.19	1.48 (1.08 – 4.05)
Psychological	1 – 100	26.04	6.42	23.56	6.40	2.48 (0.96 – 5.92)
Social	1 – 100	18.40	9.64	15.88	3.85	2.52 (1.67 – 6.71)
Environmental	1 – 100	19.36	4.53	16.52	4.20	2.84 (0.15 – 5.52)

Table 10 depicts the effectiveness of the nurse-led intervention on QOL in the comparison group. The mean difference with 95% CI the QoL in the comparison group was low in all domains.

The findings are consistent with **Jayewardene KAS and, Medagedara D (2009)** conducted a study with the aim to determine the effectiveness of using family members in the delivery of Directly Observed Treatment (DOT) in a local community, Sri Lanka. Thirty-nine TB patients detected at the Chest Clinic, Kandy between 1st of September and 31st of December 2007 were given DOT using family members (study group). Treatment outcome of the study group was evaluated in December 2008 and compared with the outcome of 42 patients, who had undergone DOT at peripheral health centers during the same period. The study found that sputum conversion rate at the end of the intensive phase of treatment of the study group was 95% and the rate of the comparison group was 88%. Treatment was successfully completed in 95% of patients in the study group and 86% of patients in the comparison group. No defaulters were found in the study group whereas 4 defaulters were in the comparison group. Observed outcome differences between the two groups were statistically significant ($p > 0.05$). Hence H₁ stated earlier is accepted.

7.5 Association of QoL with demographic variables and clinical variables

Chi-square test showed that extension of tuberculosis and the zone affected by tuberculosis in social domain and symptoms of tuberculosis in the environmental domain is influenced at $p < 0.05$ level of significance Other variables had no association It infers that clinical symptoms and environmental factors in the ward have an influence on QoL among tuberculosis patients. Hence the **H3 is accepted for the above variables and for others rejected.**

8. CONCLUSION

The study concluded that tuberculosis patients suffer from low quality of life, effective nurse-led on-pharmacological intervention can improve the QOL of patients and help them to continue to lead a healthy life

8.1 Nursing implications

Clinical practice: The intervention to improve QoL among patients with tuberculosis is a nonpharmacological approach and a cost-effective measure. Nurses in the hospitals and community play a vital role in disseminating Evidence-based practice to enhance QoL of patients with tuberculosis.

Nursing education: While providing learning experiences to nursing students in the hospital or community, students should know or make aware of the stigma and misconception regarding tuberculosis. In order to provide optimal information to patients and to help patients and families regular teaching programme to be conducted.

Nursing administration: More funding to be mobilized for CNE programme to conduct conferences and a planned IEC package to be provided in a hospital ward, OPD and Community health centers to create a positive attitude and healthy perception of TB that is preventable and curable.

Nursing Research: Similar studies can be conducted in larger samples and different settings.

8.2 Recommendations

- The study recommends exploring the various type of interventions to enhance QoL among TB patients
- Qualitative or Mixed methods of research can elicit patients and family feeling and perception regarding tuberculosis

8.3 Limitation

The study restricts generalization due to smaller samples.

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