MODEL ASUHAN KEPERAWATAN BERBASIS *KNOWLEDGE MANAGEMENT* MENINGKATKAN KEPATUHAN PASIEN DALAM PENGOBATAN TUBERKULOSIS

(Knowledge-Management-Based-Nursing Care Model Improves Patient Adherence to Tuberculosis Treatment)

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ABSTRAK

Pendahuluan. TB paru tetap menonjol sebagai salah satu masalah kesehatan masyarakat di dunia. Pasien non-kepatuhan terhadap pengobatan merupakan kontributor yang signifikan untuk resistensi obat. Penelitian ini bertujuan untuk mengembangkan dan menguji keampuhan model asuhan keperawatan untuk mencegah non-kepatuhan. **Metode** Penelitian ini terdiri dari dua tahap: tahap satu, pengembangan model, menggunakan analisis deskriptif, dan tahap dua, pengujian model, menggunakan desain kuasi-eksperimental. Peserta, terdiri kedua pasien dan perawat di dua pusat kesehatan di Surabaya, direkrut oleh consecutive sampling. Data dikumpulkan melalui wawancara, dikelola sendiri-kuesioner, check-list dan diskusi kelompok terfokus. Analisis data dilakukan dengan menggunakan kedua kuadrat terkecil parsial dan uji Wilcoxon. **Hasil.** model secara statistik efektif untuk meningkatkan hampir semua aspek kepatuhan pasien terhadap pengobatan TB (pengetahuan, disiplin dalam mengambil obat keteraturan kontrol, dan kemampuan untuk memantau hasil pengobatan dengan p <0,05), kecuali untuk kemampuan untuk mengatasi obat yang merugikan efek (p=1.000). Hal ini dimungkinkan karena jarang melakukan pasien sadar akan efek samping obat, sehingga pengalaman mereka mungkin terbatas. **Diskusi.** Penelitian ini menyimpulkan bahwa model asuhan keperawatan KM terbukti efektif untuk meningkatkan kepatuhan pasien terhadap pengobatan. studi di masa depan disarankan untuk mengevaluasi dampak dari model asuhan keperawatan KM dalam populasi yang lebih besar.

Kata kunci: Tuberkulosis paru, kepatuhan pasien, model pelayanan keperawatan, manajemen pengetahuan.

ABSTRACT

Introduction. *Pulmonary tuberculosis remains prominent as one of public health problems in the world. Patients' non-compliance to treatment is a significant contributor to drug resistance. This study aimed to develop and to test the efficacy of a nursing care model to prevent non-compliance.* ***Method*** *This study consisted of two phases: phase one, model development, used a descriptive analytic, and phase two, model testing, employed a quasi-experimental design. Participants, comprised both patients and nurses at two health care centres in Surabaya, were recruited by consecutive sampling. Data were collected by interview, self-administered-questionnaires, check-list and focused group discussion. Data analyses were performed using both partial least squares and Wilcoxon signed rank test.* ***Results.*** *The model was statistically effective to improve nearly all aspects of patients' compliance to TB treatment (knowledge, discipline in taking medications regularity of controls, and abilities to monitor the results of treatment with p < 0.05), except for abilities to cope with drug adverse effects (p = 1.000). This is possible because seldom do patients aware of the medication side effects, so their experiences were probably limited.* ***Conclusion****. This study concludes that the KM nursing care model was proven effective to improve patients' adherence to treatment. Future study is suggested to evaluate the impact of the KM nursing care model in bigger population.*

Keywords: *Pulmonary Tuberculosis, patient compliance, nursing care model, knowledge management.*

INTRODUCTION

Tuberculosis (TB), primary a lung infection caused by *Mycobacterium tuberculosis*, remains one of the most prominent public health worldwide. Patients' compliance to treatment is central to deter the disease from drug resistant. Generally patients' compliance is related to their psychological, perception, and motivational state. Non-compliance behaviour was proven as the main contributor to the increase of Multi Drug Resistant TB (MDR TB) cases.

The World Health Organisation (WHO 2013) reports that in 2012 the total incidence of TB is about 8.6 million cases, and 1.3 million people have died from the disease. Globally Indonesia is ranked fourth as the most TB-burdened country (WHO 2013). The TB prevalence is around 730 thousand cases with the prevalence rate of 297 per 10.000 (WHO 2013). Most of the cases are highly concentrated in

Java, in which East Java as the second-most burdened province from TB after West Java province. Surabaya, the capital city of East Java, was reported to have the most prevalence among other regions in the province.

That non-compliance to treatment behaviour is significant to the success of TB eradication, new nursing care model development is necessary. This article aims to report one of the developed nursing care model that is proven significant to improve patients' adherence to Pulmonary Tuberculosis treatment.

METHOD

Study comprised of two phases, the first phase aimed to develop a model while the second phase was conducted to test the efficacy of the model. The design used in the first phase of the study was a descriptive approach that explored contributing factors to nursing care model for pulmonary TB patients in two health care centres (Pusat Kesehatan Masyarakat = Puskesmas) in Surabaya. The Model was developed through interviews with Tb patients and community nurse, a focused group discussion and a discussion with TB expert. The data gained from the aforementioned activities were used to develop a nursing care model based on knowledge management. The developed model was then applied to patients using a quasi-experimental design of one group pre-post intervention test in the second phase of the study.

This study involved TB patients who were select consecutively at two of the available primary-public health services in Surabaya, and nurses who worked as the chair of TB programs at the two Puskesmas. The data were collected in three months, and from 29 TB patients and 2 nurses. Medical records of the patients were also accessed as supporting evidence for analysis.

More than 50% of the respondents were male; mostly (76%) came from Javanese background of culture where about 62% of them have monthly salary less than US$ 200. About 62% of the respondents were new patients and diagnosed with TB less than 6 months. The main mode of transport that was used by them were moped (83%). The most of respondents lived within the range of less than 5 kilometres away from the nearest Puskesmas.

All of nurses participated in the study were females, graduated from nursing academy and currently worked as managers of TB program for more than three years. Their ages were mostly older than 40 years. Nevertheless, none of the Puskesmas known to have any nursing care standard for TB patients, partly because the nurses did not have the requirement to document the given care. Given the two Puskesmas have provided the standard to care for TB patients, the nurses' knowledge about caring patients was 100% thorough.

All of the controlled variable were analysed using partial least square, while patients' adherence was measured using Wilcoxon signed rank test and Mann Whitney U Test with significant level of $p \leq 0,05$.

The ethical clearance of this study was obtained from the ethical committee at the Faculty of Public Health Universitas Airlangga. Ethical issues anticipated in this study were beneficence, justice, and humanity.

RESULT

Data obtained from questionnaires shows that nurses' knowledge about *knowledge management* nursing care model were above average scores ($\geq$75%), except in the assessment. Table 1 shows that 50% of nurse respondents already knew which patients' capacity that is required to be evaluated, as to determine whether they have any tendency to comply with TB management.

However, the nurses' performance in preventing patients' non-adherence behaviour were varied (table 2). In the aspect of assessment internalisation, most nurses (97%) were in average score. However, the nurses scored better in diagnosing, planning, and implementing care. However, most nurses reached good scores in three aspects, including *Socialisation* (83%), *combination* (100%) and *internalization* (97%). Instead, almost none of the nurses did proper phase in socialisation with patients (0-7%).

The knowledge management based nursing care model intervention does impact patients' adherence in taking TB medications (table 3). This nursing care model specifically improves patients' knowledge (table 4), discipline in taking medicine (table 5), ability in countering the adverse effect of the medication (see table 6), and the ability in monitoring the medication results (see table 7).

Table 1. Nurses' knowledge about knowledge-management based nursing care model

No	Nurses' Knowledge Assessment	Knowledge level	
		Know (%)	Do not know (%)
1	First step in nursing care process	100	0
2	Nursing care standard: Assessment	75	25
3	Assessment toward factors interfering patients' adherence	100	0
4	Patients capacity that affects adherence to treatment	50	50
5	Assessment toward patients' adherence indicators	100	0
6	Defining assessment priority at the initial process with patients	50	50
7	Nursing Diagnosis components	75	25
8	Intervention to improve patients' adherence	100	0

Table 2. Nursing care performance before the implementation of Knowledge Management-based nursing care model

No	**Evaluated Aspects**	***Knowledge management components***	**Category**		
			Good (%)	**Fair (%)**	**Poor (%)**
1	Assessment	*Socialisation*	0	38	62
		Externalization	66	34	0
		Combination	66	34	0
		Internalization	0	97	3
2	Nursing Diagnosis	*Socialisation*	0	97	3
		Externalization	69	0	31
		Combination	97	0	3
		Internalization	17	0	83
3	Planning	*Socialisation*	7	93	0
		Externalization	72	28	0
		Combination	72	28	0
		Internalization	10	90	0
4	Intervention Implementation	*Socialisation*	0	97	3
		Externalization	0	83	17
		Combination	66	17	3
		Internalization	45	41	14
5	Evaluation	*Socialisation*	83	0	17
		Externalization	0	100	0
		Combination	100	0	0
		Internalization	97	0	3

Table 3. The Comparison of the average of patients' adherence toward TB management between intervention and control group

GROUP	PRE (%)	POST (%)
Intervention	86	100
Control	86	91

Table 4. The comparison of patients' knowledge about TB medication, pre and post intervention of knowledge-management based nursing care model

Grade	Category	Intervention group				Control group			
		Pre intervention		Post intervention		Pre intervention		Post intervention	
		f	%	f	%	f	%	f	%
3	Fully Understand	10	62,5	16	100	4	80	2	40
2	Moderately informed	3	18,75	0	0	1	20	3	60
1	Do not know	1	18,75	0	0	0	0	0	0
	Total	16	100	16	100	5	100	5	100

Table 5. The comparison of patients' self-discipline in taking TB medication before and after the intervention of Knowledge Management based nursing care model

Grade	Category	Intervention group				Intervention group			
		Pre intervention		Post intervention		Pre intervention		Post intervention	
		f	%	f	%	f	%	f	%
3	Discipline	10	62,5	16	100	2	40	4	80
2	Moderate discipline	5	31,25	0	0	3	60	1	20
1	Non-discipline	1	6,25	0	0	0	0	0	0
	Total	16	100	16	100	5	100	5	100

Table 6. The comparison of patients' ability to counter the adverse effect of TB medications before and after the intervention of Knowledge Management based nursing care model

Grade	Category	Intervention group				Control group			
		Pre intervention		Post intervention		Pre Intervention		Post intervention	
		f	%	f	%	f	%	f	%
3	Sufficient	12	75	16	100	5	100	5	100
2	Moderate	4	25	0	0	0	0	0	0
1	Incapable	0	0	0	0	0	0	0	0
	Total	16	100	16	100	5	100	5	100

Tabel 7. The comparison of patients' ability to monitor the success of TB treatment, before and after before and after the intervention of Knowledge Management based nursing care model

Grade	Category	Intervention group				Control Group			
		Pre intervention		Post intervention		Pre intervention		Post intervention	
		f	%	f	%	f	%	f	%
3	Able to monitor	10	62,5	16	100	2	40	2	40
2	Moderate ability	6	37,5	0	0	3	60	3	60
1	Unable to monitor	0	0	0	0	0	0	0	0
	Total	16	100	16	100	5	100	5	100

As can be seen from Table 3, prior the intervention using knowledge management model was given, patient's adherence's score in both groups to treatment was 86%, showing that both groups were homogeny before the intervention was given. However, after the intervention, the treatment group achieve 9% higher in adherence's score as compare to the control group. Table 4 shows that the majority of respondents in the control group (80%) were fully understand about TB medication program while in the intervention group only 62.5% of respondents who had fully understand about the program. Table 4 describes that 75% respondents have already knew how to overcome the unpleasant effect of taking TB medications. On the other hand, all of the respondents in control group were able to counter the side effects of the medications. In terms of monitoring the results of the medication program, 40% of control group member were able to perform evaluate properly (see Table 7). This number was 12.5% lower when compared to the respondents in the intervention group.

Improvements were reported in all respondents (100%) from intervention group, particularly in aspects of knowledge, oral and injection medication-taking self-discipline, countering medication's adverse effects, and monitoring medication program results. On the other hand, the control group's results were varied. In terms of knowledge, 20% of the respondents remained moderately informed, and their ability in countering the adverse effects of the medications remained unchanged. However, their self-discipline in taking medications was improved by 80%.

The statistical assessment using the Mann Whitney U Test showed that there was no difference between the two groups during the pre-intervention of knowledge-management based nursing model ($p>0,05$). Instead, all measured aspect was shown to be significantly different between the two groups after the intervention. For instance, the Mann Whitney U test results in knowledge about TB medications ($p=0,074$), oral medication-taking self-discipline ($p=0,074$), regularity to control ($p=0,001$), and the ability in monitoring the medication results ($p=0,074$). However, there was no significant difference between the two groups in the aspects of countering the adverse effects of the medication ($p=1,000$).

DISCUSSION

Nurses' knowledge about the intervention (nursing care process) theory was sufficient. However, the implementation of their knowledge in assessing patients' ability that contributes to their adherence toward the real situation was compromised. This is possibly related with the overloading administration and delegation tasks, while doctors had to take over their roles in assessing the patients. This finding infers that nurses may compromise the proper assessment process and hinder patients from a successful therapy.

This finding adds the available behaviour theory that explains about knowledge as the main contributor to individual acts. Theoretically, behavioural adaptation occurs through changing processes that involve aspects of knowledge, attitude, and practice (Notoatmodjo 2010). Previous research suggest that aspect of knowledge has a close relationship with behaviour (Asna 2011; Maseda et al. 2013; Nugrahini et al. 2012).

Nurses' performance in patients' assessment, particularly in aspects of socialization, externalization, and combination was deficient. The deficiency was also found in the rest of nursing process, except in evaluation phase, the aspect of socialization. This result was suspected to relate with nurses' insufficient knowledge about nursing assessment process. The result showed in Table 4.4 implies that nurses' skill and knowledge in prioritizing diagnosis and understanding in the need of adherence were insufficient. Thus, it influences their skills in assessing patients. Cross & Cummings (2004) assert that nurses' performance has a strong relationship with their knowledge. This statement was also highlighted in different literatures, such as one in Suprapti (2010) that involved staff of Department of Water Resource Management in Central Java province (Suprapti 2010).

Patients adherence is evaluated through five indicators, including: knowledge, and self-discipline about medication and management, ability in countering the adverse effect of medication, regularity in control and monitoring, and the ability in evaluating the result of treatment. This research result implies that knowledge management based nursing model could improve patients' adherence toward TB medication program. This is possibly because the model reinforces nurses to encourage patient to adhere to treatment.

During the assessment phase, nurses as respondents are empowered to assess patients that they will bee able to ensure the clinical decision-making, diagnosis, and care-plan development is patient-centred. Thus, the patients are expected to be self-reliant.

In the implementation phase, the nurses are ready to help patients solve their problems, and acts as either mentor or counsellor, while in the evaluation phase; the nurses are able to evaluate their patients without prejudice. These thorough process would improve patients to adhere to TB treatments (Potter et al. 2013).

Nurses perform nursing care based on the knowledge, experience, attitudes, and standards. Nursing care improve patient knowledge and attitudes, so that then change the desire and ability of patients to follow treatment as prescribed (Potter et al. 2013).

Patients' knowledge improvement can be explained in two ways: because they obtain adequate information from nurses, or because positive patient-nurses contact, all of which acts as driven factors. Therefore, knowledge management based nursing care model is believed to facilitate quality patient-nurse interaction and improve patients' comprehension toward treatments and medication management.

Through socialization, externalisation, combination, and internalisation process, knowledge management nursing model facilitates patients' new perspective regarding medication adherence. Nurses are expected to assist patients to access learning through dynamic, tacit, and explicit interactions; initiated from the initiation of knowledge identification, development, distribution, utilization and retention (Setiarso et al. 2009).

Patients' improvement in taking medication is partly because the nurses take their roles as educator, reliable source of information, trainer, and caregiver. Thus, patients' adherence improves. According to Peplau's interpersonal relationship theory, Knowledge management nursing care model enables patients' reliability in adherence to treatment, and transform patients from care receptor to as partner to nurses in achieving shared-defined goals (Johnson & Webber 2015).

However, the result of this study does not indicate that the nursing model is able to empower patients in countering the side effects of TB medications. It is suspected that this

resulted from the short duration of the treatment, which was limited to two weeks of implementation. The limited time of implementation also causing patients' ability to counter medication side effects cannot be assessed further, and the majority of the patients could not share their lived-experience in managing the side effects of medication. However, the nursing care model was proven to facilitate good relationship between patients and nurses, and improves patients' knowledge that encourages their motivation in regular control.

Integrated health education within the nursing care model facilitates the clients in achieving better health outcomes. This comprehensive nursing care model does improve patients' self-concept and reliability to treatment, which proper and routine health check are some of the examples (Burton et al. 2013).

Knowledge management nursing care model was proven to be mutually beneficial for both party. The nurses are allowed to provide health education, act as consultant, encourage patients to actively participating in their care, trust their clients, and encourage their patients to be reliant, all of which is consistent to the principles of learning in the sphere of nursing (Burton et al. 2013).

CONCLUSION AND RECOMMENDATION

Conclusion

Knowledge management nursing care model was proven effective in improving patients' adherence to treatment; this includes patients knowledge and ability in managing their medications, and actions and attitude in taking medications. The patients improved their regularity in taking TB medication, accessing health services, and evaluating their medication progress.

Recomendation

Knowledge management based nursing care model can be adopted as a way to improve TB patients' adherence to treatments. Further research is suggested to evaluate the influence of this nursing care model within the larger population and using method of randomized control trial.

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