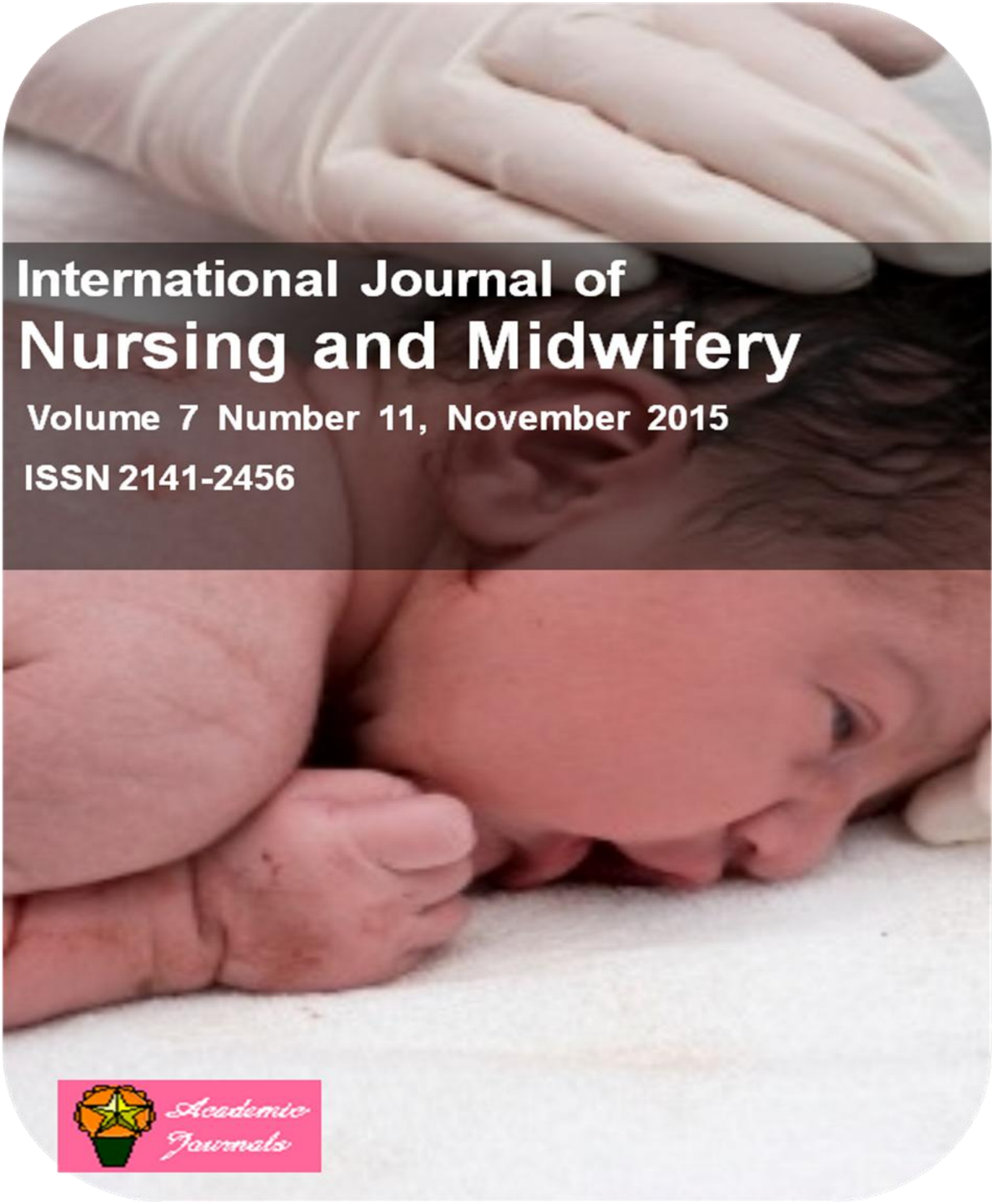

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Table of Content: Volume 7 Number 11 November 2015

ARTICLES

Research Articles

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Full Length Research Paper

Development of performance indicators of nurse practitioners in basic medical care: Applying second order confirmatory factor analysis

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This study aimed to develop the performance indicators of nurse practitioners (NPs) in basic medical care in Thailand. This research was conducted in 2 steps: the 1st step was to establish performance indicators of NPs in basic medical care by interviewing seven experts and six stakeholders about basic medical care; the 2nd step was to validate the basic medical care performance indicators of NPs by questioning NPs across the country. The tested validity of indicator model used second-order confirmatory factor analysis by MPlus program. The sample comprised 510 NPs from 23 provinces in 4 regions of Thailand derived by using multi-stage random sampling. There were 20 indicators in 5 elements: (1) assessment and diagnosis with 5 indicators; (2) caring, providing treatment of common symptoms and doing NP medical procedures with 6 indicators; (3) giving medication to relieve symptoms or treatment according to the guidelines with 3 indicators; (4) a referral and follow up on the treatment with 3 indicators; and (5) continuing patient care with 3 indicators. A model of performance indicators developed was fitted with empirical data. By weight the arranged elements were in this order: 2, 3, 4, 1 and 5; the weights were 0.986, 0.966, 0.945, 0.899, and 0.621, respectively. Performance indicators of the NPs in Basic Medical Care had 20 indicators. The indicators were derived from the person directly involved with the basic medical care; therefore, these indicators can be applied to evaluate the NPs of enhancing performance.

Key words: Indicators, basic medical care, nurse practitioner, second-order confirmatory factor analysis.

INTRODUCTION

Thailand's Ministry of Public Health has a policy to expand health or medical services in rural areas, strengthening primary care services. These primary health care centers require a great number of nurse practitioners (NPs) to do the treatment of diseases. The ministry aims to produce 10,000 NPs in 10 years from 2002 to 2012 (Terathongkum et al., 2009). For this reason, the Thailand Nursing and Midwifery Council (TNC) and nursing education institutions have prepared short 4-month courses to produce NPs. The NPs will be assigned to assess and provide treatment to cure patients, replacing the service of the physicians which are in such a shortage in Thailand. This has resulted in the beginning of standard practice control by the council

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(TNC) for the basic medical care in nursing. It proposed to the Ministry of Public Health a regulation of the nursing profession which duplicates the 2002 regulation of basic medical care. Then, it developed the revised 2008 edition and set a framework on the basic medical care (TNC, 2011) and distribute across the country to be used as a guideline.

However, although trained NPs determined the framework of basic medical care clearly, the basic medical care evaluation of the NPs has not found a clear indicator. For this situation, the researcher became interested in "When we would like to have an indicator for evaluation of the performance of the basic medical care in NPs to determine the level of performance that is sufficient for the safety of patients or not." So, the research question is "What is the indicator for the evaluation of the basic medical care performance of NPs"?

In this study, the framework was used on the basic medical care of TNC as the main framework to set a factor and create basic medical care indicators. This framework consist of: (1) ability to assess the differential diagnosis of any group, then provide appropriate treatment, care and support to imitate the regulation of basic medical care and immunity; (2) providing care, treatment of diseases and common symptoms, referral of complicated or severe symptoms and doing partial medical procedures as defined; (3) giving medication to relieve symptoms or curing the disease which imitates the regulation; (4) following up the treatment; and (5) providing the patient with continuous care (TNC, 2011).

METHODOLOGY

This study was conducted in 2 steps. The first step was to establish performance indicators by creating the primary indicators by reviewing literature and interviewing NP experts, NP preceptors, and stakeholders of basic medical care about a performance indicator evaluation of basic medical care of NPs. The framework for the interviews was based on the Thailand Nursing Council's framework of basic medical care in the five areas earlier shown (TNC, 2011). Thereafter, the interview results were analyzed and synthesized to obtain the factors (element) and the basic indicator and performance of NPs in the basic medical care questionnaire.

The second step was to validate the basic medical care performance indicators of NPs. A quantitative survey designed to achieve the research objective were sent to the NP sample across all the four regions of Thailand: North, Central, Northeastern, and South. Then, the data obtained from the questionnaires were analyzed with second-order confirmatory factor analysis technique toconfirm whether or not the factors and performance indicators of the basic medical care from the initial interviews are consistent with empirical data.

Samples

In the first step, the samples used in the interviews were purposive sampling in two subgroups; one comprised 7 experts in basic medical care (5 NP experts and 2 NP preceptors). The other comprised 6 stakeholders involved in basic medical care (2 NPs, 2 patients and 2 relatives).

In the second step, the total sample comprised 510 NPs who were not in the interview samples, from 23 provinces across the country with experience of at least two years of working and worked at a primary health care unit. They graduated from 4 nursing colleges under Praboromarajchanok Institutes in 4 regions of Thailand: Boromarajonani College of Nursing Lampang, the samples consisted of 103 NPs; Prachomklao College of Nursing, the samples consisted of 86 NPs; Srimahasarakham Nursing College, the samples consisted of 162 NPs; and Boromarajonani College of Nursing Surat Thani, the samples consisted of 159 NPs. The sample was selected by multi-stage random sampling and the sample size was determined with a ratio of 10 respondents per parameter which was considered as the most appropriate (Hair et al., 2010). As the proposed model was relatively complex (estimation of approximately 51 parameters), the study required 510 respondents.

Instrument

Structured interview form: Performance indicator treating primary care practice

This instrument was used to interview experts and stakeholders to create useful performance indicators. A structured interview was created for 10 items by reviewing literature. Item, such as the TNC, set one performance of Basic Medical Care of NP as assessment and diagnosis, what should the indicator be to evaluate this performance? Then, the content validity was checked by 5 experts, considering the issue of consistency between the questions in the interview and the purpose or desired information. The data were analyzed for Index of Item Objective Congruence (IOC) of Rovinelli and Hambleton. The results showed that the item had the IOC between 0.80 and 1.00, and the suggestions of experts were used to improve the interview.

Performance indicators of the NPs in the Basic Medical Care questionnaire

This questionnaire was used to survey NPs across the 4 regions of Thailand. A draft 5-level rating scale questionnaire with 110 items was constructed, using the information from the interview. "The NP that has to do with a patient physical examination correctly and completely" is an example of the item. Then, the content validity was checked by 5 experts and the data were analyzed for IOC. The results showed that the items have the IOC between 0.60 and 1.00, and the information from the experts was used to improve the questionnaire. Then, the questionnaire was tried out with 40 non sample NPs in Mahasarakham. The discrimination power of the item was analyzed, it was found that the discrimination power ranged from 0.51 to 0.73. The Cronbach's alpha coefficient was used to find the total reliability, and the result was 0.89.

Procedure

In the first step, collecting data by interviewing 2 subgroups; the first group consisted of experts in basic medical care and NPs, the other group consisted of patients and relatives.

Experts and NPs interview: The experts and NPs were requested through correspondent to be interviewed after which date of interview was set through telephone conversation. The participants' rights were provided to voluntarily participation, and confidentiality of the information or data obtained was guaranteed. The interview was carried out in the private area and tape record was allowed by

the interviewee.

Patients and relatives: All steps of the aforementioned procedures were carried out with the interview of patients and relatives. However, the venue was at primary health care center of the respective interviewee. In second step, the name and address of NP curriculum graduates who were not in the interview group were collected from each sample college. Then, the questionnaires and empty mailing envelopes were sent to each NP. The participants received a composite questionnaire which included a cover letter and demographics. The cover letter provided the rationale of the study, instructions, and information concerning the participants' rights to voluntarily participate, and confidentiality of the information or data obtained was guaranteed.

Data analysis

In the first step, content analysis was used to analyze data from document, open-ended questionnaire and interviews.

In the second steps, after the elements and performance indicators from the first step were obtained, the goodness and appropriateness of the indicators had to be confirmed. Therefore, the second-order confirmatory factor analysis (second CFA) technique was used to analyze the data collected from nationwide survey questionnaires which were sent back from NPs through MPlus program version 6.12. This technique was used to confirm whether or not the factors and performance indicators of the basic medical care from the initial interviews were consistent with empirical data. In this research, the second CFA of performance indicator in basic medical care latent variable analysis to check model validation or the consistency of the developed model that are consistent with any particular level of the empirical data. The cutoff values for assessing model fit indexes are shown in Table 1. The results of analysis also enable us to weigh the importance of each indicator which would be used to determine the weight of further evaluation.

Ethical consideration

Ethical approval of the study was obtained from the Institutional Review Board of Mahasarakham University (IRB-182/2014) and board of Srimahasarakham Nursing College (IRB SNC-002/2014). the participants' rights to voluntarily participate were prioritized, and confidentiality of the information or data obtained were maintained. The study results will be presented as a whole and will be used for the purposes of education only.

RESULTS

The results from the first step: to establish primary performance indicators of the NPs in basic medical care revealed that there were 20 indicators in 5 elements as detailed subsequently.

Element 1 is the assessment and diagnosis, composing of 5 indicators: (1) has a needed history, health history, chief complaint, present illness, (2) complete for all principle in patients physical examination, (3) do laboratory investigation according to the level of the hospital and symptomatic indicator, (4) knowledge of basic medical care, (5) diagnosis ability.

Element 2 is caring, provide treatment of diseases and common symptoms, and doing NP medical procedures, composing of 6 indicators: (1) treated exactly as the disease and symptoms appear, (2) treatment according to the guidelines, (3) caring help, (4) patients get well or better, (5) skills to do the medical procedure, and (6) complications after surgery must not exist.

Element 3 is giving medication to relieve symptoms or giving treatment according to the guidelines and basic immunization, composing of 3 indicators: (1) medication appropriate for diseases or symptoms, and administered within medication framework, (2) giving appropriate immunization, (3) providing advice on the use of medication or immunization.

Element 4 is referral and follow up the treatment, composing of 3 indicators; (1) follow up and support system, (2) building data base system, (3) referral system.

Element 5 is continuing patient care, composing of 3 indicators: (1) home visits, (2) ability to organize and maintain a continuous care, (3) specialized clinical services.

The result from nationwide surveys on the basic medical care performance indicators of NPs are as shown in Table 2. A shown in Table 2, the results show that the basic medical care performance indicators of NPs in total were in the high level ($\overline{X}$ = 4.32). In each indicator, the highest were caring help ($\overline{X}$ = 4.64), giving appropriate immunization ($\overline{X}$ = 4.68), and providing advice on the use of medication ($\overline{X}$ = 4.59).

The result from the second step, validate the basic medical care performance indicators of NPs by the second CFA from nationwide survey to examine the empirical data showed that the model of performance indicator to assess basic medical care (BMC) of NPs was fitted with the empirical data. Model fitted indexes at the significance level of .01 were χ^2 = 192.307, df = 165, p = 0.0716, CFI = 0.996, TLI = 0.996, RMSEA = 0.018, SRMR = 0.053 and χ^2, df = 1.17, all of which were related to cutoff values criteria (Figure 1).

The weight of each indicator of each element had statistical significance level of .01 ranging from 0.424 to 0.915, and prediction coefficients (R^2) ranging from 0.180 to 0.838.

All the 5 element's weight of performance of basic medical care have positive values ranging from 0.621 to 0.986 at statistically significance level of 0.01, and arranged elements' weight were the following elements: caring, provide treatment of common symptom and medical procedures; medication to relieve symptoms or treatment according to the guidelines and basic immunization; a follow up and support system; assessment and diagnosis; and continuing patient care. The weights were 0.986, 0.966, 0.945, 0.899, and 0.621, respectively.

These show that all elements' weights were important in performance indicators of the NP in basic medical care and Rx element was the most important, while continue element was the least important as detailed (Table 3).

Table 1. Goodness of fit indixes and and cutoff values criteria for assessing model fit indexes (Hooper et al., 2008; Hox, 2010; Goffin 2007; Sharma et al., 2005; Steiger, 2007).

Goodness of fit indixes	Cutoff values criteria for assessing model fit indexes
Relative Chi square (χ/df)	<2 or <5 (Complex Model) model fit
Comparative fit index (CFI)	≥0.95 good fit (closer to 1.0 indicating good fit)
Tucker-ewis index (TLI) or non-norm fit index (NNFI)	≥0.95 good fit , 1 perfect fit
Weighted root mean square residual (WRMR)	0.80 to 0.90 good fit, 0.90 - 1.00 mediocre fit
Root Mean Square Error of Approximation (RMSEA)	Less than 0.05 close fit, 0.05 to 0.08 reasonable fit more than 0.10 unacceptable fit
Standardized root mean square residual (SRMR)	Less than 0.05 good fit, 0.05 to 0.08 mediocre fit more than 0.08 unacceptable fit

Table 2. Mean and standard deviation of the basic medical care performance indicators of NPs.

Element/Indicator	$\overline{X}$	SD	Interpretative
Element 1: **Assessment and diagnosis**	**4.20**	**0.390**	**High**
1 Has a needed history, health history	4.46	0.374	High
2 Complete for all principle in patients physical examined	4.20	0.482	High
3 Do laboratory investigation according to the level of the hospital and symptomatic indicator	4.09	0.704	High
4 Knowledge of basic medical care	4.07	0.503	High
5 Diagnosis ability	4.17	0.488	High
Element 2: Caring, provide treatment of common symptoms, and doing NP medical procedures	**4.39**	**0.376**	**High**
1 Treated exactly as the disease and symptoms	4.21	0.484	High
2 Treatment according to the guidelines	4.42	0.472	High
3 Caring help	4.64	0.431	Highest
4 Patients get well or better	4.22	0.461	High
5 Skills to do the medical procedure	4.39	0.514	High
6 Complications after surgery must not exist	4.47	0.470	High
Element 3: Giving medication to relieve symptoms or giving treatment which imitate the regulation	**4.57**	**0.388**	**Highest**
1 Medication appropriate with diseases or symptoms, and administered within medication framework	4.43	0.434	High
2 Giving appropriate immunization	4.68	0.413	Highest
3 Providing advice on the use of medication immunizations. (Adv)	4.59	0.480	Highest
Element 4: **Referral and follow up the treatment**	**4.34**	**0.434**	**High**
1 Follow up and support system	4.18	0.527	High
2 Building data base system	4.45	0.495	High
3 Referral system	4.41	0.485	High

Table 2. Cont'd

Elements 5: Continuing patient care	**4.09**	**0.541**	**High**
1 Home visits	4.04	0.609	High
2 Ability to organize and maintain a continuous care	4.00	0.604	High
3 Specialized clinical services	4.24	0.609	High
Total	4.32	0.341	High

Table 3. Results of the second CFA of the performance indicators of the NP in basic medical care.

Element/Indicator	Elements' weight	R^2
Element 1 Assessment and diagnosis (PEDX)	0.899**	0.807
1.1 Has a needed history, health history,Chief complaint, present illness (Hx)	0.424**	0.180
1.2 Complete for all principle in patients physical examined (PE)	0.663**	0.440
1.3 Do laboratory investigation according to the level of the hospital and symptomatic indicator (Lab)	0.522**	0.272
1.4 Knowledge of basic medical care (K)	0.798**	0.637
1.5 Diagnosis ability (Dx)	0.849**	0.720
Element 2 Caring, provide treatment of common symptoms, and doing NP medical procedures (Rx)	0.986**	0.973
2.1 Treated exactly as the disease and symptoms (Sym)	0.854**	0.729
2.2 Treatment according to the guidelines (Guide)	0.772**	0.597
2.3 Caring help (Caring)	0.568**	0.322
2.4 Patients get well or better (Well)	0.648**	0.420
2.5 Skills to do the medical procedure (Skill)	0.826**	0.682
2.6 Complications after surgery must not exist (Com)	0.781**	0.610
Element 3 Giving medication to relieve symptoms or giving treatment which imitate the regulation (Treat)	0.966**	0.934
3.1 Medication appropriate with diseases or symptoms, and administered by medication framework (Med)	0.915**	0.838
3.2 Giving appropriate immunizations (immu)	0.629**	0.395
3.3 Providing advice on the use of medication or immunization. (Adv)	0.675**	0.456
Element 4 **Referral and follow up the treatment (Follow)**	0.945**	0.894
4.1 Follow up and support system (FU)	0.740**	0.548
4.2 Building data base system (Dbase)	0.705**	0.497
4.3 Referral system (Refer)	0.791**	0.626

Table 3. Cont'd.

Element 5 Continuing patient care (Continued)	0.621**	0.386
5.1 Home visits (Home)	0.820**	0.672
5.2 Ability to organize and maintain a continuous care (organiz)	0.822**	0.676
5.3 Specialized clinical services (Clinic)	0.784**	0.615

**Statistically significant as 0.01.

DISCUSSION

There are 20 indicators in 5 elements of the performance indicators of NP in basic medical care, and arrange elements' weights were the following elements: caring, provide treatment of common symptoms and medical procedures; medication to relieve symptoms or treatment base on the guidelines and basic immunization; a follow up to maintain and referral, assessment and diagnosis, and continuing patient care. The weights were 0.986, 0.966, 0.945, 0.899, and 0.621, respectively. These show all elements' weights were important in performance indicators of the NPs in basic medical care. These correspond with Rhoads (2006). The health history lays the foundation for care. It guides the relative emphasis placed on each system in the physical examination and formulation of differential diagnosis and treatment decision. A weak foundation places the patient at risk for misdiagnosis and inadequate or erroneous treatment; it also identifies the clinician as one who does not practice within acceptable standard of care, making him vulnerable to legal action. It also correspond with Fenstermacher and Hudson (2014) who mentioned that history and physical examination, for history data must find chief complaint, present illness, family history, past medical history and systematically investigate the various body systems to obtain any additional information that would be helpful in arriving at an accurate diagnosis. It is the responsibility of practitioners, relying on their experience and knowledge of their patients, to make diagnoses, to determine drug dosages and the best treatment for each individual patient, and to take all appropriate safety precautions. In addition, it corresponds with Stanhope and Lancaster (2014) who said that NPs receive advance training. Training emphasizes clinical medical skills (history, physical examination, and diagnosis), in addition to the traditional psychosocial and prevention-focused skills that are normally thought of as nursing (Nies and McEwen, 2011).

Nurses from clinics or health departments often conduct home visits as a part of patient follow-up. The focus of all home visits is on the individual for whom the referral is received. In addition, the nurse assesses the individual-family interaction and provides education and interventions for the family and client. Furthermore, these correspond with Gardner et al. (2006) who found that theperformance indicators of NP competencies in Australia and New Zealand demonstrates advanced knowledge of human sciences and extended skills in diagnostic reasoning, give ability to synthesis and interpret assessment information including client, patient history, physical findings and diagnostic data, decisions about preventive, diagnostic and therapeutic responses and interventions that are based on clinical judgment, establishes therapeutic links with the patient/client/community, and relationships with other health professionals. Moreover, Klemenc-Ketis et al. (2014) who found that evaluation of nurse practitioners in primary care settings whose the clinical approach, comprehensive approach and patient-centered approach were used as very good. Finally, from research findings, this can give concerned idea of how to find the performance of basic medical care of NP evaluations in 20 earlier indicators.

Conclusion

The performance indicators of the NP in basic medical care had 20 indicators in 5 elements. The indicators were derived from these NPs, NP experts, patients and relatives who were directly involved with the basic medical care. Collecting data was carried out in actual conditions. Therefore, these indicators can be applied to evaluate the NPs for enhancement of their performance in basic medical care.

LIMITATIONS AND FUTURE IMPLICATION OF WORK

In this study, only basic medical care indicators which are a part of multi-sided job of NPs were developed. So, the next study should deal with development of other aspects of NP performance. The indicators created were created in the context

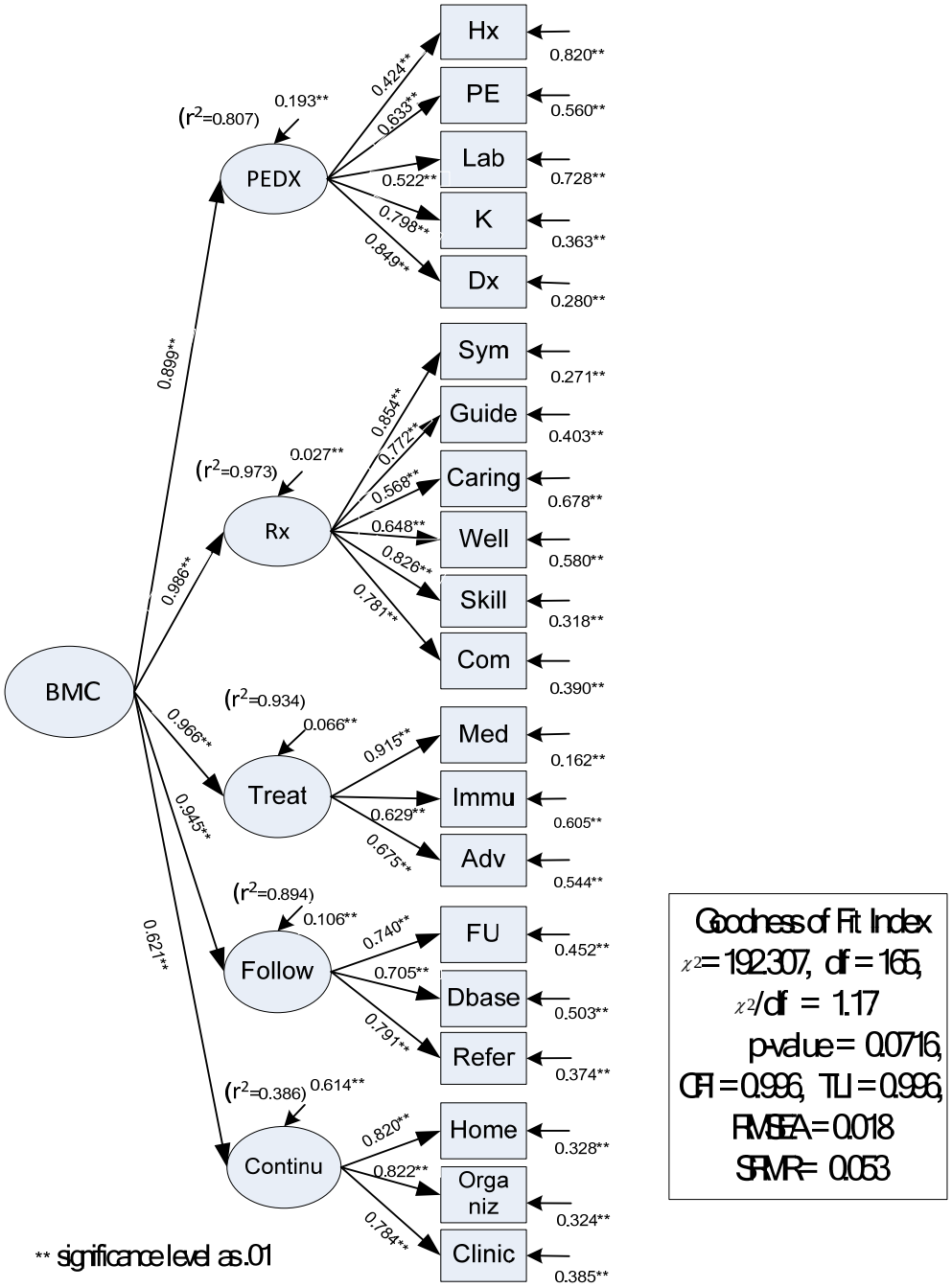

Figure 1. The 2nd CFA model of the performance indicators of the NP in basic medical care.

of NPs in Thailand; therefore, further implication of these indicators should be carried out after the detail of the indicator has been thoroughly studied.

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Conflict of interest

The authors declare that they have no conflict of interest.

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Full Length Research Paper

The effectiveness of the intervention of "Sehat Umakna Sehat Anakna" towards improving the behavior, knowledge and attitude of pregnant mother towards maternal and neonatal care in Mandailing Natal, Sumatera Utara, Indonesia

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Behavior that can influence the status of public health cannot be separated from the culture of the community itself and family habit in a treatment. Mandailing Natal (Madina) district is one of the regions with high maternal and child mortality rate, and the life of the community is very much influenced by their tradition and culture. This is a quasi-experimental study with an intervention in the form of involving the community members in health care through the establishment of health awareness community team "Sehat Umakna Sehat Anakna". The population of this study includes all the pregnant mothers in Madina district, and 78 of them were selected for this study through purposive sampling technique. The data for this study were obtained through questionnaire distribution and interviews. The result of this study showed that the intervention done had a significant influence on the health status with behaviour, knowledge and attitude (*p* value < 0.001 comprising knowledge with p = 0.001.) The conclusion is that, intervention has brought an impact in improving the status of public health especially for mothers and their babies through health care. The government and health workers should involve the community members in the implementation of health program and pay attention to the local culture.

Key words: Behavior, knowledge, attitude, culture of community.

INTRODUCTION

One of the purspose of achievements of the government in the field of health, which is in line with the millennium development goals (MDGs) program for 2015, is to improve the status of mother and child health through

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minimizing the maternal and infant mortality rate. The acceleration of minimizing maternal and infant mortality rate must involve all aspects, such as medical, health services management and active role of community aspects (Depkes, 2002).

Health status will be determined by the condition commencing from pregnancy up to the delivery and it is related to the behavior of mother and family in daily health care. Mandailing Natal (Madina) district is one of the districts of the province of Sumatera Utara with the maternal and infant mortality rate which is still higher compared to the other districts of other provinces. Madina district is also one of the districts that focused on the acceleration of the MDGs achievement program, especially the expanding maternal and neonatal survival (EMAS) program for mother and infant. Besides, the lives of the people living in Madina community is still very much influenced by family tradition and socio-cultural habits adopted and practiced for generations. To date, based on the aforementioned assumption and phenomenon, intervention compulsorily needed to be performed to improve the public health status through community empowerment program. The intervention implemented was the establishment of a model through the socio-cultural based involvement and active role of the community in improving maternal health behavior, especially in the form of action taken in health care during pregnancy, delivery, post-partum and baby care.

Health status is a dynamic and individual condition influenced by personal and environmental factors. There are 4 factors that influences people's health status; these factors are heredity, health care, environment and behavior. Of the 4 factors, the ones with a significant role in the degree of people's health are the environmental factor (45%) and behavioral factor (30%) (Saunders et al., 2005). High maternal mortality rate related to pregnancy and delivery in the community is influenced by tradition with 3 "late" conditions (too late to take decision, too late to arrive in the venue of medical services and too late to get adequate medical assistance) and 4 "too" conditions (too old, too young, too many and too close to birth distance) (Depkes, 2002). The application of theory with community empowerment in preventing and minimizing the maternal and child morbidity and mortality rate is an important thing that must be paid attention to, especially the problem influenced by socio-cultural practices (Bobak et al., 2005).

Culture is a set of guidelines that are inherited by individuals as members of a particular community, and how to relate to others (Nasution, 2005). Ritonga (2002), argued that several concepts are often used as the basis of cultural distinction, character, basic personality, perception, concept of time, thought, language, values, behaviors (norms, rules, properties) and grouping as well as social relationships. Most of the human actions and behaviors is based on the values of what is considered bad, good and neutral, although this way of grouping is different from one tribe and culture to the others.

Batak community in general includes the Mandailing who are still on the traditional level in terms of essence of life have their common main purpose of life such as hamoraon (wealth), hagebeon (having many children), and hasangapon (the have) (Nasution, 2005). Socio-cultural factor plays an important role in understanding the attitude and behavior to respond to pregnancy, delivery, and the treatment of the mother and her baby. Some part of cultural view on these issues has been inherited from generation to generation in the culture of the given community (Meutia, 1998).

METHODOLOGY

This is a quasi-experimental study with pretest-posttest non equivalent group design conducted in two groups, namely intervention group and control group. Intervention group was conducted in two stages; the first stage was to establish the health awarteness community team with program "Sehat Umakna Sehat Anakna" and the second stage was to continue the intervention to the respondents, comprising pregnant mothers. The members of the health awareness community team were 28 persons representing community figures, adat figures, health cadres and village apparatuses who were believe to be able to be the role model in the life of the community.

Based on the concensus result, the health awareness community team established in Mandailing Natal (Madina) district will be involved in the program to improve the status of mother and child health. The team members were then trained for one month, and were educated on topics related to antenatal care, delivery, post-partum and neonates based on the perception and culture of local community. After the training, the team was assigned to provide the extension to the 39 pregnant mothers who were in the intervention group, while the other 39 pregnant mothers who were in the control group extension were not given any extension. The extension materials were delivered in local language and in accordance with the understanding of the mothers.

Data were obtained through questionnaire distribution and interviews conducted before and after the intervention was carried out. The data obtained were analyzed through Paired-t test (pretest and posttest) by the group of health awareness team. The independent-t test done to the respondents comprising the pregnant mothers belonged to both intervention and control groups. The statistical test was applied at $\alpha = 0.05$.

RESULT

The members of health awareness community team who had been trained were 28 persons. There was a difference between the knowledge and attitude of the members of health awareness community team before and after the training as shown in Table 1. The characteristics of respondents (pregnant mothers) are presented in Table 2.

Based on Table 2, it was found out that in general the pregnant mothers belonged to the high risk range in reproductive health either in the intervention or control groups. There was a difference between mother's behaviour, such as the knowledge and attitude of the

Table 1. The difference of the score of pretest and postest of the knowledge and attitude of the members of Health Awareness Community Team (N = 28).

Assessed items	Before		After		*p*
	N	%	N	%	
Knowledge					
Good	4	14.3	10	35.7	0.031
Poor	24	85.7	18	64.3	
Attitude					
Good	6	21.4	16	56.1	0.002
Poor	22	78.6	12	42.9	

*Note: < 0.05.

Table 2. Frequency distribution characteristics of respondents of pregnant women (N = 78).

Variable	Intervension		Control	
	N	%	N	%
Age				
> 20 years	7	17.94	5	12.82
20-35 years	12	30.76	11	28.20
>35 years	21	55.26	22	56.41
Number of children				
1	4	10.2	3	7.69
2-3	5	12.8	4	10.25
>3	30	76.9	32	82.05
Distance born				
< 2 years	25	64.10	26	66.66
> 2 years	14	35.8	13	33.33
Education				
No school	8	10.26	9	11.54
Elementary school	16	20.51	14	17.95
Junior high school	6	7.69	5	6.41
Senior high School	5	6.41	6	7.69
Undergoadrate	4	5.13	5	6.41
Working				
Peasant/Laborers	6	16.4	4	10.3
Entrepreneur	2	5.1	5	12.8
Goverment	2	5.1	3	7.7
Other	29	74.4	27	69.2
Income				
<Rp. 700.000	10	25.6	6	15.4
Rp. 700.000-2.000.000	23	59.0	23	59.0
>Rp. 2.000.000	6	15.4	10	25.6
Decition making				
Husband	32	82.1	31	79.5
Wife	2	5.1	1	2.6
Husband and wife	4	10.3	4	10.3
Other family members	1	2.6	3	7.7
Total	-	78	-	

Table 3. Differences in mother's behaviour: knowledge in the intervention group and the control group (N = 78).

Behaviour	Intervention				Control				*p*
	Before		After		Before		After		
	N	%	N	%	N	%	N	%	
Knowledge									0.001
Good	23	59	34	87.2	27	69.2	64.1	-	
Poor	16	41	5	12.8	12	30.8	35.9	-	

*P<0.05.

Table 4. Differences in mother's behaviour: attitude in the intervention group and control group (N = 78).

Behaviour	Intervention				Control				*P*
	Before		After		Before		After		
	N	%	N	%	N	%	N	%	
Attitude									
Good	25	64.1	34	87.2	27	69.2	64	69.2	0.001
Poor	14	35.9	5	12,8	12	30.8	12	30.8	

*P<0.05.

intervention and control groups as shown in Table 3.

Based on Tables 3 and 4, there are several influences of intervention on several variables of health status such as behaviour of mother pregnant knowledge and attitude.

DISCUSSION

In general, the result of this study showed that intervention had influence on the improvement of maternal and neonatal health status with impact behaviour: knowledge and attitude with pregnant mother, community team in Mandailing Natal (Madina) district.

According to Notoatmojo (2003), education, experience, culture and belief are the factors influencing the knowledge and attitude of people. Besides, the knowledge has influence on the level of awareness in solving health problems, medication, disease prevention and treatment. The existence of a tradition in the community such as cultural views about pregnancy and birth, morbidity, and mortality in every area varies according to the existing beliefs and customs (Bobak et al., 2005). Various diseases and cases that caused the maternal and infant morbidity and mortality are closely related to the perception of culture that is not conducive to health, and this condition is still widely found in various places in Indonesia, especially in areas that are still dominated by local customs (Swasono, 1998). Changes in the public behavior that has become their daily habit and belief embraced from generation to generation is a difficult thing to do without involving the person who actively plays a role in the given culture. The implementation of intervention in this study directly involved community leader in capacity as a role model for the people in the area (Friedman, 1998).

This agrees with the notion that social condition is a condition or position socially deliberately arranged that a person is put at a particular position in the social structure (Soekanto,1997). The implementation of intervention by involving community members and paying attention to the social culture of local community in improving behavior especially the behavior of pregnant mothers in antenatal care, delivery, post-partum and neonates is an appropriate and effective action in supporting the program to achieve more optimal degree of public health status. This fits with the role and function of the health workers who facilitated the involvement of family and community members in assisting the individual and families in order to be able to make decisions, to help families gain a positive experience in accordance with their expectations, to overcome the problems in maternal and infant care, and the interaction among them through an educational program known as a family-centered maternity care (May and Mahlmeister, 1990).

The intervention was done through community empowerment, by making the community members independent through the materialization of the potential ability owned in antenatal care, delivery, post-partum and neonates. This intervention can be gotten by paying attention to the social culture of the local community members, involving local community figures and local adat leaders. Intervention was carried out by activating the role of community members who play an important role in influencing beliefs, traditions and customs. This is in line with the concept saying that community empowerment is an attempt to enhance the dignity of society that in the present conditions are not able to

escape from the trap of poverty, ignorance and backwardness.

Empowerment is an attempt to make the community members independent through the materialization of the potential ability owned. One of the effective strategies in improving health status such as behaviour through the application of community empowerment is through educative approach, namely, a series of planned and directed activities systematically implemented by the active participation of the individual, group or community members intended to solve the problems faced by considering the social, economic and cultural issues. This opinion is similar to that of Mikkelsen (2011), says that logic model underlying participatory strategies or community participation in the effort of community empowerment to achieve the goal of development that can be achieved in harmony and the possibility of the incident of conflict between social groups, but this can be mitigated through the pattern of local democracy.

Community participation has brought positive impact to the development, and community participation is also an effective tool to mobilize local resources such as human beings and nature with the aim of implementing certain development program. The extension activity performed is in the form of education intended to equip the team members with good and correct or standard knowledge and positive attitude in health care. The implementation of intervention is one of the cognitive approaches that can help optimalize the role of community members in improving the behavior of pregnant mothers in maternal and child health care.

This is in accordance with the theory saying that knowledge can improve emotional control, improve the independence of the client, increase self-esteem, improve endurance and can help clients to adapt to the problem or a disease that can ultimately improve the quality of life for clients. The forming of behavior started with the cognitive domain which then caused inner response in the forms of attitude toward an object and this response eventually will be in the forms of action or skill. Providing information is a cognitive approach to psychosocial intervention designed to analyze and change the wrong beliefs or values embraced by the client, and also help the client to learn how to use the effective coping strategies (Sarafino, 1994).

The approach to public health behavior change must be preceded by the ability of health workers to master a wide range of socio-cultural background of the people concerned. Social and economic backgrounds have a relationship with the public health behavior (Notoatmodjo, 2005). The daily life of the people of Madina district is still much influenced by the customs, myths, beliefs in supernatural including the antenatal care, giving birth and neonatal care (Daulay, 2010).

Particularly in Mandailing ethnic community, in regulating the system of life, they use the system of Dalian Na Tolu (the three pedestals) the Anak Boru (son in laws of the family of our wife's father and his clan), Kahanggi (our wife's brothers and those who marry our wife's sisters or any son of the family of those with the same clan as our wife's father) and Mora (our wife's father and the male members of the family with the same clan as our father in law). If there is a problem in one family bound in marriage, those entitled to make a decision is the Dalian Na Tolu (the three pedestals). The culture views a marriage without children as a less fortunate one, that any child born by a married couples is always traditionally blessed in a ceremony known as Di Pasu-Pasu (Ritonga, 2002).

This is in line with the opinion saying that the indirect causes of maternal and neonate mortality are the community conditions, such as education, the information received, the role of health workers and the socio-economic and cultural conditions (Pillitteri, 2003). As a health worker, to understand the culture-related community behavior is an important thing in influencing the behavior of pregnant mothers and their family. Mandailing culture is part of core culture of Batak, in which various traditions and cultures in daily health care are still much adopted in the life of Mandailing community (Nasution, 2005).

According to Leiningger in the theory of Transcultural Nursing, health care is an area of cultural science in the process of learning and nursing practice focusing on looking at the difference and similarity between cultures with respect to the care, being healthy and ill is based on human cultural values, beliefs, actions, and the knowledge used to provide nursing care, particularly the culture or cultural integrity to the human being (Tomey and Alligood, 2006).

The culture and tradition adopted by the community can be positive, but there is also a culture that does not comply with the principles of health. As health workers who are responsible to provide education to the community, should be able to correct the perceptions and negative habits that are not conducive to health. This is consistent with the theory of Leininger (1979), Culture Care Diversity and Universality: Transcultural Care, stating that three measures can be adopted in accordance with the culture of patients/community, such as cultural care preservation, accommodation and repatterning (Giger and Davidhizar, 1995).

CONCLUSION

The implementation of intervention through the establishment of health awareness community team has brought an impact in improving the behaviour of pregnant women in Mandailing Natal (Madina) district community. The variables with significant influence were the knowledge of pregnant mothers (p = 0.001) and attitude (p = 0.001). Madina district community have their own habit, or tradition and culture in antenatal care, delivery,

post-partum and neonates. Some of the culture they are practicing positively supports the health but there are also cultural pratices which do not comply with the principles of health.

RECOMMENDATIONS

1. The government and health workers should involve the community members in the implementation of health program, and pay attention to local culture, knowledge and attitude.
2. Health workers need to understand the cultural background of the local community, the habits and cultural traditions related to the antenatal care, delivery and baby care adopted and practiced by the pregnant mothers and their family that the positive culture or habits can be optimized and the negative culture can be avoided.

Conflict of interest

Authors have none to declare.

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Reproductive health providers' willingness to provide comprehensive abortion services and knowledge of the abortion law in Addis Ababa, Ethiopia

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In Ethiopia, the maternal mortality ratio is 676/100,000 live births with complications from unsafe abortion being the leading cause. The current study was conducted to assess the knowledge of reproductive health practitioners of the law governing abortion in Ethiopia, the willingness of providers to perform abortion procedures, and current comprehensive abortion care (CAC) practice patterns of physicians, midwives, and nurses at one teaching hospital in Addis Ababa, Ethiopia. All currently practicing obstetric/gynecologist faculty and residents, midwives, and nurses working on the obstetrics and gynecology ward at one public teaching hospital in Addis Ababa were invited to participate in this cross-sectional survey. A total of 50 participants completed the survey. 68% of the sample, reported being willing to provide abortion services, if offered the appropriate training. Participants who believe unsafe abortion is a large contributor to poor health of Ethiopian women are almost seven times more likely to be willing to provide CAC services, and physicians are more likely than non-physicians to report being comfortable currently providing CAC services. Obstetric and gynecological providers at St. Paul's are supportive of providing abortion services, if they are trained in the procedure. Ensuring proper clinical training, as well as sensitization to the recent law change and the burden of unsafe abortion, is of the upmost importance to ensure Ethiopian women have access to safe abortions, as allowed by law.

Key words: Ethiopia, abortion, family planning.

INTRODUCTION

Of the nearly 300,000 maternal deaths each year, the World Health Organization (WHO) estimates 47,000 are attributable to unsafe abortion, making abortion a leading cause of maternal mortality worldwide (WHO, 2011). Unsafe abortion is defined by WHO as a procedure for terminating an unintended pregnancy carried out either

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by persons lacking the necessary skills or in an environment that does not conform to minimum medical standards, or both (WHO, 1997). WHO, estimates approximately 21.2 million unsafe abortions occur each year in developing regions of the world (WHO, 2011; Aahman and Shah, 2004). The morbidity and mortality associated with unsafe abortion depend on the method used, the skill of the provider, the cleanliness of the instruments and environment, the stage of the woman's pregnancy and the woman's overall health (WHO, 2011).

Almost all unsafe abortions occur in low- and middle-income countries (Grimes et al., 2006). The health consequences and burdens from unsafe abortion disproportionately affect women in Africa more than any other developing regions (Shah and Ahman, 2009). The risk of death is the highest in sub-Saharan Africa where one in 150 women will die from complications related to the procedure (WHO, 1997). Further, an estimated one quarter of women who undergo an unsafe abortion will require hospitalization for treatment of complications, stretching already limited healthcare resources (WHO, 2012). It is estimated 5 million women per year from the developing world are hospitalized for complications resulting from unsafe abortions, resulting in long and short-term health problems (Singh, 2006), and straining resource-poor health systems where, in some countries, treating abortion complications exhausts 60% of gynecological health budges (Johnston et al., 2007). Deaths from unsafe abortion significantly impact the united nation (UN) millennium development goal (MDG) number 5, to reduce by three quarters the number of maternal deaths. Without addressing unsafe abortion, MDG 5 will not be reached (WHO, 2012; Hu et al., 2012).

According to the Ethiopian demographic and health survey 2011 (Central Statistical Agency, 2012), the maternal mortality ratio is 676 per 100,000 live births, with complications from unsafe abortion being the leading cause of maternal death. Unintended pregnancy rates are high, as are induced abortions, due in part to low uptake of modern contraception (Gebreselassie et al., 2010; Worku et al., 2006). Approximately six in 10 abortions carried out in Ethiopia are conducted under unsafe conditions. Ethiopian health professionals estimate 58% of all women undergoing an unsafe abortion experience serious complications, while only 25% of these women receive treatment (Guttmacher Institute, 2010). Although less than half of all women experiencing an abortion complication seek treatment, it remains the leading cause of hospital admissions in Ethiopia (Gessessew, 2010).

In 2005, following recommendations from the international community on strategies to reduce the negative impact of unsafe abortion on women's health (Gebrehiwot and Liabsuetrakul, 2008), the government of Ethiopia decriminalized abortion in cases of rape or incest, where the pregnancy endangers the health or life of the mother, if the child has a gross malformation or if the mother is unfit to raise the child (Gebrehiwot and Liabsuetrakul, 2008). The law sanctions a skilled provider working at a healthcare facility equipped with the appropriate supplies and equipment to perform abortions if the gestation period is less than 12 weeks.

Ethiopia has a limited number of obstetricians/gynecologists, general medical practitioners (GMPs), midwives, health officers, and nurses trained to legally perform abortion (up to the 12th week of gestation), as the country's current health professional curricula do not include any formal training in abortion and contraception services for students. Moreover, an estimated 70% of these healthcare providers are unfamiliar with the revised abortion laws (Gebreselassie et al., 2010). In a 2001 to 2002 study in a major university hospital in Addis Ababa, post-abortion complications were one of the three leading causes of maternal mortality (Berhan and Abdela, 2004) suggesting there is a need to train providers in this service. The abortion rate in Addis Ababa has been estimated to be the highest in the country, perhaps because women from rural areas come to the city where it is known that abortion services are more available (Singh et al., 2010).

As part of a larger initiative to improve the pre-service training of reproductive health providers abortion care training, the current study is conducted to assess the knowledge, willingness, and current comprehensive abortion care (CAC) practice patterns of obstetrician/gynecologists (Ob/Gyn) faculty and residents, midwives, nurses, and GMPs at one teaching hospital in Addis Ababa, Ethiopia. For the purpose of this study, CAC was defined as safe, high-quality and accessible first trimester abortion services, treatment of abortion complications, contraceptive services and counseling. This baseline assessment seeks to ascertain the degree to which these practitioners currently provide services as well as their attitudes and willingness to provide abortion and family planning services.

METHODOLOGY

Study setting

St. Paul's Hospital Millennium Medical College is located in Addis Ababa, Ethiopia. Built in 1961, St. Paul's is the second largest public hospital in the country treating over 200,000 patients annually. The mission of the hospital is to provide care to the underserved. Approximately 75% of the patients served are provided care free of charge. The medical school associated with the hospital admitted the first students in 2007 with the mission to produce medical personnel who will meet the country's health care needs. To achieve this, St. Paul's recruits at least 30% of its students from underdeveloped regions (the so-called four emerging regions of the country) and reserves at least 30% of its medical student slots for women. Currently, 29% of its students are female. In July 2012, St. Paul's started a postgraduate training program in obstetrics and gynecology. As part of this new residency, a program

for residents, medical students, nurses, and midwives to receive education and training in comprehensive family planning, including abortion care, has been developed.

Participants

Participants were recruited by department heads at St. Paul's. All currently practicing obstetrics and gynecology faculty (n=4) and residents (n=8), midwives (n=18), and nurses (n=26) working on the obstetrics and gynecology ward were invited to participate. In any day, there are rotating residents from Black Lion Hospital, hence the 8 residents who completed the survey (at the time of this survey, there were 7 SPHMMC residents in training). There are, on any particular day, senior medical students, called interns, working in the gynecology wards providing services. Therefore, the classes of participants were obstetrics and gynecology faculty who are fully qualified specialist physicians, obstetrics and gynecology residents who are specialists in-training, General medical practitioners who are general practice physicians, interns who are senior medical students, general nurses and midwives. Participants were given a written informed consent document explaining the scope of the study. All participants were assured participation was fully voluntary, and their responses would be completely anonymous. No incentives were provided.

Survey tool

This cross-sectional, self-administered survey was developed collaboratively by a team of researchers from St. Paul's Hospital Millennium Medical College and the University of Michigan Medical School, and deployed in May, 2013. An initial draft was based on a survey conducted in Ghana (Gebrehiwot and Liabsuetrakul, 2008), and adapted to meet local context. The survey was assessed for both face and content validity by US and Ethiopian researchers familiar with family planning research in Ethiopia in particular, and sub-Saharan Africa in general. The survey consisted of 3 general sections; demographics, current self-reported provision of family planning services, and questions regarding the participants' views and willingness to provide family planning and abortion. The survey was written in English and then translated to Amharic for those participants who do not read English. The Amharic translation was back-translated to English to ensure it was translated appropriately.

Data analysis

To examine the understanding of the legality of abortion services in Ethiopia, participants were asked: "To your knowledge, what is the legal status of abortion in Ethiopia (choose all that apply)?" The answer options included: it is illegal under all circumstances; it is legal to save the life of the mother; it is legal if the pregnancy is the result of rape or incest; it is legal to preserve the mental or physical health of the mother or; it is legal under all circumstances.

Questions regarding how often participants provide family planning services, such as implants, intrauterine device (IUD) insertion, and contraception counseling, as well as comprehensive abortion care, were answered on a Likert scale ranging from 1 (most days) to 5 (never). Questions concerning participants willingness to provide family planning services, such as implants, IUD insertion and contraception counseling, as well as comprehensive abortion care if they were offered training, were also answered on a Likert scale ranging from 1 (very unwilling) to 5 (very willing). A question to assess how supportive participants were to establishing safe abortion services in Ethiopian hospitals was also asked on a Likert scale from 1 (not at all supportive) to 5 (fully supportive). A further question asked, "How big of a health problem is unsafe abortion for Ethiopian women?" Answers were reported on a Likert scale ranging from 1 (no problem at all) to 5 (one of the biggest health problems).

Participants were next asked about services they feel comfortable providing. They were asked to indicate which of the following they currently feel comfortable providing: comprehensive abortion care, post-abortion care, referral to abortion provider, assisting with comprehensive abortion care, none—I do not wish to provide abortion services, IUD insertion, family planning counseling, abortion counseling, and termination.

All study procedures and documents were reviewed and approved by the Ethical Review Board, St. Paul's Millennium Medical College and the University of Michigan Institutional Review Board.

Statistical analyses

All data were double entered into an Excel spreadsheet and checked for consistency. Where inconsistencies were found, the original data were consulted and the entered data were corrected. Once data entry was complete, data were uploaded to statistical package for the social sciences (SPSS) V. 20 (SPSS Company, Chicago, Il). Descriptive statistics were generated on current position (job classification), participant's age, willingness to provide family planning services, and knowledge of the law governing abortion.

Each answer option for knowledge of the law was entered into the dataset as a separate variable. As written, the law allows abortion if it is to save the life of the mother, the pregnancy is the result of rape or incest, to preserve the mental or physical health of the mother (Central Statistical Agency, 2012). As such, a summation variable was created for respondents who answered the three options. Participants for whom the value of the summed variable was 3 were deemed to have complete knowledge of the abortion law in Ethiopia. Participants whose summed variable was less than 3, or who answered that either option 1 (abortion is illegal under all circumstances) or option 5 (abortion is legal under all circumstances) were deemed to have incomplete or limited knowledge of the law.

Cross tabulation with chi-squared analysis was performed to assess factors associated with willingness to provide comprehensive abortion care and current comfort with providing termination services. Significance was set at 5%. Factors assessed included position, age, complete knowledge of the law, and currently providing CAC as part of regular activities. Position was initially assessed as asked (Ob/Gyn resident, Ob/Gyn faculty, other faculty, general practitioner, Intern, nurse, midwife, other) and then a dichotomized variable for physician (Ob/Gyn resident, Ob/Gyn faculty, GP, intern) was created and assessed against willingness to provide comprehensive abortion care (CAC) as well as knowledge of the current law governing abortion.

The original question regarding the health burden associated with unsafe abortion was dichotomized to those who believe it is a big problem (originally answered "a big problem" or "one of the biggest health problems) being coded with a 1 and those who believe it is a small problem (originally answered "no problem at all", a "small problem" or "a problem") being coded 0. A logistic regression with this new health problem dummy variable as the independent variable was performed against willingness to perform CAC. Those variables that were found to be significant in bivariate analysis were entered into the logistic regression model. Only those variables which continued to be significantly related to the outcome variable in the multivariable regression were included in the final model.

RESULTS

A total of 50 participants took part in the survey. Over half of the participants in this study (n=25) were nurses, 18.4% (n=9) midwives, and 16.3% (n=8) Ob/Gyn residents (Table 1). The participants ranged in age from 22 to 56 with a mean
age of 31.1 years (standard deviation 9.8 years).

In general, this study sample was willing to provide comprehensive abortion care; almost 71% of the sample reported being either “very willing” or “willing” to provide CAC services, if offered the appropriate training with only 22.8% reporting being either “unwilling” or “very unwilling”. Over 77% of the sample identified unsafe abortion as either “a big problem” or “one of the biggest health problems” facing Ethiopian women. The majority of respondents (79.2%) reported being either “supportive” or “very supportive” of establishing safe abortion units in Ethiopian hospitals.

Only 18.4% of this study sample reported not wanting to provide abortion services. Only 12.2% currently feel comfortable providing these services. The results of cross tabulations (not shown) revealed all Ob/Gyn residents (n=8) and faculty (n=1) report being willing to provide CAC services. Further, a majority of nurses (9/15, 60%) and almost half (4/9, 44%) of midwives are supportive of providing CAC, if provided with training in the procedure. Chi squared analysis indicates that physicians and non-physicians have a differential willingness to provide CAC. When grouped together, physicians are more likely to report being willing to provide CAC services than non-physicians (p=.014).

Physicians were not more knowledgeable about the law than non-physicians. Physician status, as opposed to non-physician status, was not significantly related to complete knowledge of the law governing abortion, and complete knowledge of the law was not significantly associated with willingness to provide CAC services (analysis not shown).

This study sample is generally comfortable providing many aspects of family planning, including family planning counseling (83.7% are comfortable with providing this service) and IUD insertion (53.1% are comfortable). However, assisting with an abortion was reported as less comfortable by participants (30.1%), with only 18.3% of those surveyed reporting being comfortable making a referral to an abortion provider.

Those participants who believe unsafe abortions are a big health problem in Ethiopia (n=37) report being more willing to provide CAC services (Chi-squared = 5.02) than those participants who believe unsafe abortions are not a problem or a small problem (n=11). When entered into a logistic regression, participants who believe unsafe abortion is a large contributor to poor health of Ethiopian women are almost seven times more likely to be willing to provide CAC services (OR 6.89, 95% CI, 1.08 to 43.9) (Table 2). While only 24% (n=12) of this study participants correctly answered the questions regarding the law governing abortion, 44% (n=22) reported that all parts of the law were clear to them.

Physicians were more likely than other cadres of health workers to answer in the affirmative to the question, “I currently feel comfortable providing CAC services”. When entered into a logistic regression, physicians were over six times as likely to feel comfortable providing comprehensive abortion care services than their non-physician counterparts (OR: 6.4; 95%CI: 1.02-40.3) (Table 3).

DISCUSSION

34 of the 49 (70.8%) respondents reported being “very willing” or “willing” to provide comprehensive abortion services if adequately trained in the procedure. While this is in contrast to the findings of Abdi and Gebremariam (2011) indicating only a quarter of their participants in Addis Ababa were willing to participate in pregnancy termination, the limited sample size in the current study hinders the ability to generalize to the population. However, only six of the 49 participants (12.2%) currently feel comfortable providing terminations. The finding of the necessity of increased training supports those of Mekbib et al. (2007), where the vast majority of post-abortion complications in 9 of the 11 regions of Ethiopia were treated using evacuation and cutterage, as opposed to manual vacuum aspiration (MVA), despite MVA being the current safe method advocated by experts. These findings point to the urgent need for training in safe abortion techniques among health providers in Ethiopia. Given the high rates of induced abortion in Addis Ababa as found by Singh et al. (2010), providing safe and affordable access to high quality abortion care is a necessity.

Similarly to the survey of health providers in Addis Ababa by Abdi and Gebremariam (2011), this study sample identifies unsafe abortion as a large problem in Ethiopia with 74% of the study participants noting it is either “one of the biggest problems” or “a big problem”. However, contrary to their findings, this study sample reported being much more willing to provide these services themselves if they are given proper training. This study finding of perception of the health burden represented by unsafe abortion as being predictive of willingness to provide CAC services underscores the importance of teaching this topic. Providers need to be made aware of the huge contributor of unsafe abortion to maternal mortality and morbidity.

Given the recent change in the law governing abortion in Ethiopia, provider education on the revised law is necessary. Few of the study participants were fully knowledgeable of the law, although almost half (44.9%)

Table 1. Selected demographic information and survey responses.

Question	Response	Frequency	%
What is your current position?	Ob/Gyn resident	8	16.3
	Ob/Gyn faculty	1	2.0
	GP	1	2.0
	Midwife	9	18.4
	Nurse	25	50.0
	Intern	5	10.2
	Missing	1	-
If you had training in comprehensive abortion care, how willing are you to provide CAC?	Very willing	17	35.4
	Willing	17	35.4
	Neither willing nor unwilling	3	6.3
	Unwilling	4	8.3
	Very unwilling	7	14.5
	Missing	2	-
How big of a problem is unsafe abortion in Ethiopia?	No problem at all	1	2.1
	Small problem	5	10.4
	A problem	5	10.4
	A big problem	18	37.5
	One of the biggest health problems	19	39.6
	Missing	2	-
How supportive are you of establishing safe abortion services in Ethiopian hospitals?	Not at all supportive	2	4.2
	Not supportive	4	8.3
	Neither supporting nor	4	8.3
	Unsupportive	-	-
	Supportive	17	35.4
	Fully supportive	21	43.8
	Missing	2	-
How often do you provide comprehensive abortion care as part of your everyday activities?	Very often	15	30.0
	Some days	10	20.0
	Not many days	5	10.0
	Few days	6	12.0
	Never	14	28.0
Knowledge of the abortion law	Complete knowledge	12	24.0
	Incomplete knowledge	38	76.0
Are all portions of the abortion law clear to you?	Yes	22	44.9
	No	27	55.1
I do not wish to provide abortion services	Yes	9	18.4
	No	40	81.6
I currently feel comfortable providing termination	Yes	6	12.2
	No	43	87.8
I currently feel comfortable providing post-abortion care	Yes	19	38.8
	No	30	61.2
	Missing	1	-

Table 1. Cont'd

I currently feel comfortable providing referral to an abortion provider	Yes	9	18.3
	No	40	81.7
	Missing	1	-
I currently feel comfortable assisting with complete abortion care	Yes	15	30.1
	No	34	69.4
	Missing	1	-
I currently feel comfortable providing IUD insertion	Yes	23	46.9
	No	26	53.1
	Missing	1	-
I currently feel comfortable providing family planning counseling	Yes	41	83.7
	No	8	16.3
	Missing	1	-
I currently feel comfortable providing abortion counseling	Yes	12	24.5
	No	37	75.5
	Missing	1	-

Table 2. Logistic regression of willingness to provide CAC versus health problem.

Variable	Odds ratio	95% CI
Health problem	6.89	1.08-43.9

CI: Confidence interval; *p < 0.05.

Table 3 Logistic regression of comfort with providing termination versus physician.

Variable	Odds ratio	95% CI
Physician	6.4	1.02-40.3

CI: Confidence interval; *p < 0.05.

felt the law was clear to them. This survey did not assess patient knowledge of the law however previous studies have demonstrated that even in countries where restrictive laws are liberalized, changing the law is not sufficient to imparting this knowledge on citizens. For example, Gebrehiwot and Liabsuetrakul (2008) found non-significant reductions in post-abortion complication rates following liberalization of the law in Ethiopia. If the providers of these services are not aware of the legality of the services, it is not altogether surprising that unsafe abortion rates are not falling more quickly.

This study has several limitations. With only one faculty member answering the survey, it is hard to draw conclusions about this cadre of health worker. The overall limited number of surveys is also a limitation. The survey did not ask about whether participants have received training in abortion services. Further, for those participants who reported being unwilling to provide these services, the survey did not ask about reasons for being unwilling to provide services. Further, this study relied completely on self-report and did not objectively assess the current extent to which participants provide family planning services. Lastly, surveys were distributed to shift manager at the beginning of each day, who then approached participants to complete the survey during downtime while on duty. All completed surveys were returned via shift managers (that is, midwives gave their completed surveys to the midwife in charge) who then returned completed surveys to the study team. Although, this ensured the study team was not informed of who did or did not complete the survey, completing a survey while on duty and being supervised by the manager may have

have affected completion rates.

Conclusion

Obstetric and gynecological care providers at this tertiary care teaching hospital in Addis Ababa, Ethiopia are generally willing to provide comprehensive family planning once they are properly trained in these procedures. Training on safe abortion services and family planning services both pre-service and in-service settings is the first step in addressing the high rates of maternal mortality attributable to unsafe abortion.

Conflict of interest

The authors have none to declare.

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