



Improvement of Early Antenatal Care Initiation: The Effects of Training Local Health Volunteers in the Community

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Abstract

Background: Although antenatal care (ANC) coverage has been increasing in low- and middle-income countries, the adherence to the ANC initiation standards at gestational age <12 weeks was inadequate including Thailand. The study aimed to improve the rate of early ANC initiation by training the existing local health volunteers (LHVs) in 3 southernmost provinces of Thailand.

Methods: A clustered nonrandomized intervention study was conducted from November 2012 to February 2014. One district of each province was selected to be the study intervention districts for that province. A total of 124 LHVs in the intervention districts participated in the knowledge–counseling intervention. It was organized as half-day workshop using 2 training modules each comprising a 30-minute lecture followed by counseling practice in pairs for 1 hour. Outcome was the rate of early ANC initiation among women giving birth, and its association with intervention, meeting an LHV, and months after training was analyzed.

Results: Of 6677 women, 3178 and 3499 women were in the control and intervention groups, respectively. Rates of early ANC were significantly improved after the intervention (adjusted odds ratio [OR]: 1.29, 95% confidence interval [CI]: 1.17–1.43, $P < .001$) and meeting an LHV (adjusted OR: 2.06, 95% CI: 1.86–2.29, $P < .001$), but lower at 6 months after training (adjusted OR: 0.76, 95% CI: 0.60–0.96, $P = .002$). Almost all women (99.7%) in the intervention group who met an LHV reported that they were encouraged to attend early ANC.

Conclusion: Training LHVs in communities by knowledge–counseling intervention significantly improved early ANC initiation, but the magnitude of change was still limited.

Keywords

early ANC attendance, antenatal care, local health volunteers, community, pregnancy, knowledge–counseling

Introduction

Antenatal care (ANC) is one of the 4 pillars of safe motherhood in the Mother-Baby package recommended by the World Health Organization (WHO) since 1994.¹ Antenatal care visits should begin as early as possible to facilitate early identification of any underlying problems and provide timely treatment to ensure that the woman is as healthy as possible during pregnancy and for birth.² Early ANC attendance is important in reducing maternal morbidity and mortality.³ The WHO suggests ANC initiation before a gestational age of 12 weeks and a minimum of 4 visits during the pregnancy (<12, and at 26, 32, and 38 weeks) for low-risk pregnancies⁴; however, ANC recommendations vary between countries regarding timing, number, and service content of visits.^{5,6-9}

To date, there has been little research on how to increase the percentage of women having early ANC. The WHO advises that working with community leaders and other influential

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parties to ensure the community's understanding of the benefits of early ANC may be helpful.² A study suggested that improved health education, community involvement, and integration of local health personnel can improve the quality of ANC.¹⁰ Therefore, effective interventions to strengthen the understanding of community leaders concerning the benefits of early ANC may be useful.

In Thailand, the national ANC coverage in 2012 was 98%¹¹; however, the rate of early ANC has not been uniformly reported and not achieved the country target. Pattani, Yala, and Narathiwat provinces are 3 southernmost provinces of Thailand in which more than 80% of the population are Muslim with different traditions or beliefs of ANC initiation. This study aimed to determine the effectiveness of training local health volunteers (LHVs) in communities using a knowledge–counseling intervention on early ANC initiation before 12 weeks in the 3 southernmost provinces of Thailand.

Methods

Study Design and Settings

A cluster nonrandomized intervention study was conducted in Pattani, Yala, and Narathiwat provinces, from November 2012 to February 2014. Antenatal care for low-risk pregnancies in the districts of Thailand is the responsibility of nurses and public health officers working in subdistrict health promotion hospitals located in each subdistrict and the primary care units of the district hospitals. Within each district, there are LHVs, who are the residents in each district, working on health promotion and prevention including maternal and newborn health under the supervision of district and subdistrict health personnel. The number of LHVs in each district depends on the number of households by subdistrict.

Intervention Group

Two LHVs under the administrative areas of each subdistrict health promotion hospital were purposively selected by the chief of the district personnel considering the vigorous performance of LHVs. A total of 124 LHVs accounted for 6% of all LHVs in study areas were invited to participate in the study intervention. All agreed and signed a consent form before joining the intervention.

The knowledge–counseling intervention included a half-day training workshop consisting of a group session, lecture, and counseling exercise using 2 modules specially prepared for the intervention, 1 on ANC, in particular early ANC before 12 weeks of gestation, and the other on common obstetric problems in pregnancy. The printed modules were written in simple words with photographic illustrations which emphasized knowledge and counseling techniques including a section featuring common questions that the LHVs faced in the communities, with answers integrated with traditional religious beliefs of pregnant Muslim women.

In the workshop, the LHVs completed a self-rated assessment questionnaire on their knowledge and skills noted in the

modules and benefits expected from the workshop before the session started. Then the session began with a 30-minute lecture in accordance with the knowledge contents of the module followed by a 60-minute counseling exercise for each module. Finally, the intervention participants were asked to complete the same self-rated assessment questionnaire on the knowledge, skills, and benefits gained from the workshop and their satisfaction with the intervention when the workshop finished. The knowledge, counseling skills, and overall satisfaction with workshop were evaluated by 5-rating scales from lowest, low, moderate, high, to highest.

The 2 printed modules were also given to the LHVs who had not been invited to attend this workshop. The knowledge–counseling interventions were first carried out in February 2013, and then 6 months later, a refresher seminar including a lecture and group discussion on the challenges of applying the knowledge and counseling from the first workshop was conducted.

Control Group

A control district not located adjacent to the intervention district was also selected, based on an approximately equivalent number of annual deliveries and rate of early ANC in 2011. To fulfill anonymous and confidential principles, the districts in this study were unnamed. The interventions were not performed to the LHVs in the control districts; thus, it was not a blinded study.

Data Collection and Outcomes

The pregnant women in both intervention and control districts were unaware of whether they were being cared for by an LHV who had attended the intervention or not. Apart from the intervention, the services and activities provided to pregnant women were the same in both intervention and control districts, as were other health activities within the study districts.

Gestational age at first ANC visit and meeting an LHV of all pregnant women who came for giving birth in the district hospitals in both intervention and control groups during 1-year period from March 2013 to February 2014 at postintervention period was collected. The primary outcome was the early ANC defined as pregnant women's attendance at ANC before 12 weeks of gestation. Whether the women met an LHV before coming for ANC was the secondary outcome.

Data Analysis

The data were analyzed by R version 3.3.1 (2016 The R Foundation for Statistical Computing). Five scales of evaluation items were categorized into “low” if ratings were lowest, low, and moderate and “high” if ratings were high and highest. The percentages of “high” of the evaluation items before and after attending workshop were shown. Effect of intervention, meeting an LHV, and months after training on the rate of early ANC were analyzed on an intention-to-treat basis of the district

Table 1. Self-Rating Evaluation of Local Health Volunteers at Starting and at the End of Intervention Workshop.

Evaluated Items	High Self-Ratings					
	Pattani		Yala		Narathiwat	
	Starting (%)	End (%)	Starting (%)	End (%)	Starting (%)	End (%)
Knowledge	64.3	100	42.9	100	33.3	88.9
Counseling skills	43.9	90.5	60.0	97.0	47.6	86.1
Confidence in performing duties for pregnant women	51.2	90.5	54.3	93.9	42.8	91.7
Benefit to themselves	78.0	100	80.0	97.0	65.8	97.2
Benefit to pregnant women	80.5	100	71.5	100	73.8	97.2
Overall satisfaction of workshop	97.6		97.1		96.7	

assigned by univariate analysis and multiple logistic regression. A *P* value of .05 was considered as significant.

The sample size of women was calculated using a 2-proportion formula (65% in the control and 75% in the intervention) with 95% confidence interval, power of 90%, and the ratio of 1; at least 460 women in each control and intervention group were required.

Ethical Considerations

The study proposal was approved by the ethics committee of the Faculty of Medicine, Prince of Songkla University, and the Institute for the Development of Human Research Protection, Thailand. A clinical trial registration number was not available. This manuscript was prepared based on the guidelines of the Transparent Reporting of Evaluations with Nonrandomized Designs statement.

Results

Of 124 LHV's invited, 123 (99.2%) participated in the knowledge–counseling intervention. Increasing percentages of participants who rated “high” on all evaluation items were found at the end of intervention workshop (Table 1). Of the 6893 pregnant women who came for ANC during the postintervention period, the gestational ages at first ANC were missing for 216 women, leading to a total of 6677 women (96.9%) for final analysis, with 3178 and 3499 women in the control and intervention groups, respectively.

Intervention, meeting an LHV, and months after training were associated with the rate of early ANC in univariate analysis (Table 2). Women in the control group (43.2%) and in the intervention group (45.2%) indicated that they had met an LHV when they felt pregnancy before seeking for ANC (*P* = .11). Almost all women (99.7%) in the intervention districts who met an LHV reported that they were encouraged to attend early ANC. Table 3 shows the independent effect of training, meeting an LHV, and months after training on the rates of early ANC. The rate of early ANC was significantly lower at 6 months after the intervention, but then increased again after the refresher training at 6 months after training.

Table 2. Rates of Early ANC Between Control and Intervention Groups and Between Women Who Did Not Meet and Met a Local Health Volunteer.

Comparisons	No. of Women	Rate of Early ANC, n (%)	<i>P</i> Value
Group			
Intervention	3499	2392 (68.4)	<.001
Control	3178	1988 (62.6)	
Meeting local health volunteer			
Yes	2954	2196 (74.3)	<.001
No	3728	2184 (58.7)	
Months after training			.007
1st	649	434 (66.9)	
2nd	581	355 (61.1)	
3rd	543	358 (65.9)	
4th	494	328 (66.4)	
5th	505	345 (68.3)	
6th	565	335 (59.3)	
7th	538	354 (65.8)	
8th	774	516 (66.7)	
9th	534	363 (68.0)	
10th	524	361 (68.9)	
11th	532	331 (62.2)	
12th	421	287 (68.2)	

Abbreviation: ANC, antenatal care.

Discussion

Almost all LHV's rated their knowledge and counseling skills higher after they attended the knowledge–counseling intervention. Significantly higher rates of early ANC were found in the intervention group compared to the control group and among women who met an LHV compared to those who did not meet. It is of interest to note that the rate of early ANC decreased at 6 months following the initial intervention training, but then increased again after the refresher training.

Although the WHO recommended early ANC before 12 weeks, the gestational age for ANC initiation previously reported varied across countries in Asia and Africa from 12 to 20 weeks.^{3,4,7,12,13} To improve early ANC, the LHV's were selected to be the target of the intervention in our study because they are local residents living in the community, thus they have a good understanding of the local lifestyles and

Table 3. Effect of Training, Meeting a Local Health Volunteer, and Months After Training on the Rates of Early ANC by Multiple Logistic Regression.

	Crude OR (95% CI)	Adjusted OR (95% CI)	P Value (Wald Test)	P Value (LR Test)
Groups (ref = control)				<.001
Intervention	1.30 (1.17-1.44)	1.29 (1.17-1.43)	<.001	
Meeting an LHV (ref = no)				<.001
Yes	2.05 (1.84-2.27)	2.06 (1.86-2.29)	<.001	
Months after intervention (ref = 1st month)				.002
2nd	0.78 (0.62-0.98)	0.79 (0.62-1.00)	.05	
3rd	0.96 (0.75-1.22)	1.02 (0.80-1.31)	.87	
4th	0.98 (0.76-1.25)	1.05 (0.82-1.36)	.69	
5th	1.07 (0.83-1.37)	1.16 (0.90-1.50)	.24	
6th	0.72 (0.57-0.91)	0.76 (0.60-0.96)	.02	
7th	0.95 (0.75-1.21)	1.04 (0.81-1.33)	.78	
8th	0.99 (0.79-1.24)	1.06 (0.85-1.33)	.61	
9th	1.05 (0.82-1.34)	1.11 (0.86-1.42)	.42	
10th	1.10 (0.86-1.40)	1.16 (0.91-1.50)	.23	
11th	0.82 (0.64-1.04)	0.88 (0.69-1.13)	.31	
12th	1.06 (0.82-1.38)	1.18 (0.90-1.54)	.23	

Abbreviations: ANC, antenatal care; CI, confidence interval; LHV, local health volunteer; LR, likelihood ratio; OR, odds ratio.

beliefs, particularly religious and traditional beliefs, which might affect a woman's attitudes or knowledge toward ANC.¹⁴ It was supported by the fact that lack of knowledge on time to start ANC among pregnant women has been identified in the studies from Ethiopia and Nigeria.^{6,8,12,13,15}

Moreover, a meta-analysis of qualitative studies found that the main reasons for late attendance of women were perceived pregnancy as a normal life event, lack of understanding of ANC benefits, embarrassment, and cultural and/or supernatural implications of pregnancy disclosure.¹⁶ Those reasons may be attributed to being unaware of the benefits of early ANC initiation^{8,16}; thus, encouraging women to have early ANC and access core ANC services is required.⁵ In our study, rate of early ANC of women who met an LHV before coming for ANC was significantly higher than among women who did not meet such a volunteer.

The rates of early ANC after the intervention and 6-month refresher training were significantly higher in the intervention districts than in the control districts, a finding which supports a previous recommendation that continuous training and supervision for the health workers and initiatives involving the community are required.¹⁷ Although the significance between the intervention and control groups was presented, only a small improvement of 6% increased early ANC initiation was shown. This significance was due to large samples with high power; thus, the interpretation should be with caution. The small improvement could be because only 6% of the LHVs in the intervention districts were trained. However, the evidence of a recent systematic review on regional and global levels and trends of early ANC coverage from 1990 to 2013 without intervention showed small improvement which accounted for 1% to 3%.¹⁸ This type of knowledge-counseling intervention could be adapted for use in countries having LHVs working on health promotion of maternal health for improving early ANC initiation.

There were some limitations. First, the parts of our intervention dealing with traditional/religious beliefs would need to be modified in accordance with individual country contexts based on different ethnic and language considerations.¹⁹ Second, our study was a cluster nonrandomized intervention study which may introduce selection bias of study settings, though we expected the homogeneous characteristics of district settings and pregnant women in the districts. Third, we did not ask the women who came for ANC in the control district whether their LHVs provided them counseling on early ANC initiation; thus, the contamination could not be confirmed. Fourth, we recorded only main outcome of the study without other individual characteristics of women; thus, the confounding effects should be taken into account. Finally, only early ANC initiation was measured as an effect of the intervention because a previous study found that the gestational age at first ANC attendance was the important predictor of pregnancy outcomes.²⁰

The findings of this study can be a lesson learned for other settings where LHVs are available in the communities and the desired rates of high early ANC have not been achieved. Further studies on wide-scale training and measuring the quality of ANC including early ANC, appropriate number of visits, and quality of services provided are required.

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