RESEARCH COMMUNICATION

Can a Home-Visit Invitation Increase Pap Smear Screening in Samliem, Khon Kaen, Thailand?

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Abstract

Our objective was to assess the efficiency of a home-visit invitation aimed to increase uptake of cervical cancer screening in women between 35 and 60 years of age. From May, 2006, we conducted a quasi-randomized trial to determine if an in-home education and invitation intervention would increase uptake of cervical cancer screening. We randomly recruited 304 women from the Samliem inner-city community, Khon Kaen, Northeast Thailand, and assigned participants to either the intervention or control zone. Baseline screening coverage interviews were then performed: 58 of 158 women in the intervention zone and 46 of 146 in the control zone were excluded from the study because of having had a Pap smear within 5 years, but these were included in the final analysis. First, 100 women in the intervention group were visited in their homes by one of the researchers, who provided culturally-sensitive health education that emphasized the need for screening. Four months later, post-intervention, screening-coverage interviews were again performed in both groups, in combination with the same health education for 100 women in the control group for a comparison. There was no difference in the baseline Pap smear screening-coverage rate in the intervention vs. control zones (36.7 vs. 31.5%, p=0.339). One hundred women in the intervention group completed the intervention interviews and after four months, 100 women in the intervention group and 100 in the control group also completed the post-intervention interviews. The increased screening-coverage rate in the intervention zone was similar to that of the control zone (43.6 vs. 34.9%, p=0.119); however, there was a borderline significant increase in the intervention zone compared with baseline (36.7 to 43.6%, p=0.070). Therefore, home visit education and invitation intervention produced only a nominal effect on increasing Pap smear coverage within a 4-month study period.

Key Words: Pap smear - cervical cancer - screening coverage

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Introduction

Cervical cancer is the third most common cancer worldwide, with at least 400,000 new cases identified throughout the world each year. Eighty percent of these cases occur in developing countries where some 200,000 die as a result of cervical cancer every year (Parkin et al., 1999).

Cervical cancer is potentially one of the most preventable cancers, unlike many other cancers, because it is easily detectable and has a prolonged pre-malignant phase (British Medical Association, 1986). The Papanicolaou, or Pap smear, is a screening test used worldwide, primarily for the detection of precancerous changes within the cervix (i.e., abnormalities in the cells of the cervix known as dysplasia) (Peters et al., 1988).

The WHO has calculated the level of protection women gain as a population by regular screening and the number of tests they will need in a lifetime. An annual screening smear provides a 93.5% reduction in the incidence of cervical cancer and screening every 5 years provides an 85% reduction (IARC working group, 1986). Due to limited resources, Thailand has a screening policy of every 5 years for women between 35 and 65 years of age.

There are several reasons why women developing invasive cervical cancer fail to have cancer detected at a pre-invasive stage by screening (Chamberlain, 1984; Chamberlain, 1986): (1) primarily because they have never been screened at all (MacGregor, 1982; Walker et al., 1983; Chisholm et al., 1984; Ellman et al., 1984; Paterson et al., 1984; Choyce et al., 1990); and, (2) secondarily a lack of knowledge or awareness. The latter could be improved by health education and direct invitations to undergo a Pap smear during regular home visits by community-based healthcare professionals.

In Thailand, cervical cancer is the most common female cancer, killing ~5,000 annually and increasing. A multi-province survey by the Thai National Cancer Institute found that coverage of the previous cervical cancer screening program (i.e., the opportunistic Pap smear) was only 5% (Srivatanakul, 2000) compared with the WHO target of 80% (Sankaranarayanan, 2001).

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A systematic review published in 2005 in The Cochrane Database shows that invitations are an effective method of increasing uptake of cervical cancer screening. However, the majority of studies reviewed were from developed countries; thus, their relevance to developing countries is unclear (Forbes et al., 2005).

A study was conducted with the aim of determining coverage in a defined population in Thakaserm sub-district in Nampong district, a rural area of Khon Kaen Northeast, Thailand. All women 20 and over were asked to complete a questionnaire and a total of 1,199 responded, of whom 66.9% reported having had a Pap smear test at least once, while 33.1% had never had one (Kritpetcharat et al., 2003). Coverage of Pap smear screening every 5 years among Khon Kaen inner-city women is thought to be even lower than this.

To reduce the incidence and mortality of cervical cancer among Thai women, we designed this study to assess the efficiency of a home visit invitation intervention to increase uptake of cervical cancer screening among women between 35 and 60 years of age to the WHO recommendation.

Materials and Methods

Samliem community is a large community located near Khon Kaen University campus; therefore, 1 to 1.5 km (10-15 min on foot) from Srinagarind (University) Hospital and not more than 500 m from a community health station where women can get a Pap smear. We designed this study as a quasi-randomized trial to answer the question, "Can home visit invitation increase uptake of Pap smear testing?" We subdivided the community into intervention or control zones in May, 2006. By a random walking survey, we randomly selected 304 women between 35 and 60 years of age within these 2 zones for interviews. The design was used to decrease bias and data contamination because of the short distance between respondents' homes. Women, who had undergone a Pap smear within five years, had previously had an abnormal Pap smear, had no cervix or were terminally ill, were excluded.

Sample size was calculated from our pilot study, which indicated that Pap smear coverage in this community was 30%, and we expected to see an increase to 50% four months after intervention. With a power of 80%, $Z\alpha=0.84$ and $Z\beta=1.96$, we needed at least 93 women in each zone. We were, however, able to provide intervention and interviews for 100 eligible women in each study group. We, thus, collected data on Pap smear coverage within 5 years in each group by asking all of the selected women until we reached 100 eligible women (i.e., those not excluded by any of the above criteria) in each zone for the intervention and control groups. Finally, 158 and 146 women comprised the intervention and control groups, respectively (Figure 1).

One-hundred women randomly selected in the first zone were assigned to an intervention group (which would get a home-visit invitation) while 100 women in the second location were assigned to the control group. We first gathered baseline information on both groups by Family Practitioner Nurses based at the Samliem Health Station,

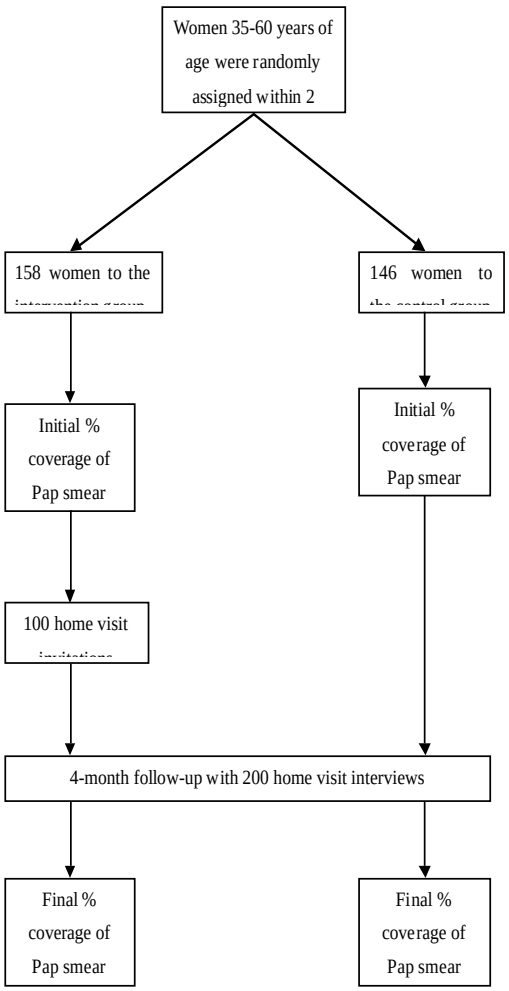

Figure 1. Participant Flow Chart

through interviews of all 200 women (i.e., name, date of birth, address, marital status, parity, education, career and monthly income) during the first home visit. No intervention was given during the first home visit. Then within the month of May, 2006, all of the women in the intervention group had the study explained to them and they then provided informed consent as per the requirements of our institutional ethics review board.

Participants were visited at home and shown the leaflet then given the short questionnaire. After the interview, each woman was left with a fact sheet for further reading. All of the interviews and invitations to have an annual Pap smear check-up were done by one of the authors (WC) and lasted between 45 min and 1 hr. The outcomes of the intervention were evaluated during a third home visit interview four months after the first home visit invitations by the same author. By this time (September, 2006), all of the women in the control group would have had the same intervention as the first group. Pearson's chi-square test and student T-test were used for the continuous data. Fisher's exact test were used for categorical data.

Results

Samliem community has a total population of 12,942; of whom 6,694 are women and of these 1,905 are between 35 and 60 years of age. The intervention zone (Moo 14)

Table 1. Comparison of Demographic Data

Characteristics	Intervention*	Control	P-value
Age (mean in years)	47.0	47.4	0.719
Marital status			
Married	87	86	1.000
Single	13	14	
Parities (mean)	2.1	2.5	0.345
Educational level			
Primary school	54	53	0.863
Secondary school	25	23	
Bacheler degree or higher	21	24	
Employment status			
Household worker	45	49	0.790
Private business employee	5	5	
Private business owner	32	33	
Government officer	18	13	
Income/month (Thai Baht)			
<5,000	32	37	0.662
5,001-10,000	27	30	
10,001-15,000	21	13	
15,001-20,000	11	11	
20,000-25,001	9	9	

has a total female population of 3,842 with 789 between 35 and 60; while the control zone (Moo 16) has a total female population of 9,130 with 1,796 between 35 and 60.

Table 2. Baseline Practices vis-à-vis Annual Pap Smear Screening

Practices	Intervention	Control	P-value
Previous pelvic exam			
Yes	86	78	0.136
No	13	22	
Reasons for exam			
1. Check-up	27	19	0.240
2. Leukorrhea	13	15	0.684
3. Itching	10	16	0.293
4. Bleeding	5	4	0.999
5. Pain	14	17	0.558
6. Dysmenorrhea	7	4	0.535
7. Mass	2	1	0.999
8. Infertility	1	0	0.999
9. Postpartum	46	52	0.479
10. Dysuria	3	3	0.999
11. Others	4	2	0.683
Reasons for non-exam			
1. No symptoms	10	15	0.392
2. Shame	5	14	0.054
3. Fear of pain	5	2	0.445
4. Other	6	0	0.029
Cervical cancer awareness			
1. Yes	84	92	0.128
2. No	16	8	
Previous Pap smear			
1. Yes	70	75	0.526
2. No	30	25	
Time since last Pap smear			
1. 5 years	37	36	0.509
2. > 5 years	33	40	
3. Never had	30	24	
Reasons for never having Pap smear			
1. No symptoms	21	19	0.860
2. Shame	12	13	1.000
3. Fear of pain	11	3	0.052
4. Other	8	3	0.215

Of the 304 women selected at random from the two zones of this inner-city community, we successfully recruited 200 (65.8%); that is, they had none of the exclusion criteria.

We excluded 104 (34.2%) because their previous Pap smear was done within the past 5 years. The coverage of Pap smear among women 35-60 years-old--according to the Thai national cervical cancer screening program (every 5 years)--was 34.2%. No other exclusion criteria were found.

Our randomization successfully yielded two comparable study groups. There was no significant or practical difference between these two groups in the distribution of subjects by age, marital status, parities, educational level, employment status or income (Table 1). Both groups were similar in their baseline cervical cancer screening practices (Table 2); that is, 86% of the participants in the intervention group had received a Pap smear >5 years prior to the baseline interview vs. 78% in the control group (p=0.136). One hundred women (100%) in the intervention group participated in the intervention interviews (at the beginning) and one hundred women (100%) in the control group also participated in the post-intervention interviews (at the end). This means that all 200 women in both groups (100%) received a home visit invitation and health educational session.

Among the 200 women not obtaining recommended screening exams at baseline, there were substantial increases in Pap smear screening among both the intervention and control groups (Table 3). These improvements were similar between groups (11 vs. 5, p=0.136). The reasons why 89 and 95 of the women in the intervention and control group did not get a Pap smear after 4 months were similar: (1) no occasion, (2) no symptoms, (3) shame, and, (4) fear of pain.

We asked participants, What strategies would encourage them to get a Pap smear? They answered similarly: (1) sending out a mobile unit, (2) giving them an appointment, and (3) using supporting activities (i.e., special holidays, mass screening with friends, or even a legal requirement). However, some participants said that no external organized incentive would help because getting a smear would always depend upon circumstances. These proposed strategies were not significantly different between groups except that the intervention group proposed the

Table 3. Four-month Post-intervention Pap Smear Check-up

Practices	Intervention	Control	P-value
Pap smear uptake within 4 months			
1. Yes	11	5	0.193
2. No	89	95	
Reasons for not complying			
1. No occasion	69	65	0.652
2. No symptoms	15	24	0.530
3. Shame	6	11	0.310
4. Fear of pain	2	2	1.000
What would help			
1. Mobile unit	27	53	<0.001
2. Appointment	19	10	0.108
3. Supporting activities	17	19	0.854
4. Nothing but an occasion	30	19	0.100

Table 4. Initial and Final Coverage of Pap Smear in Both Zones

Timing of Survey	Zone I N=158	Zone II N=146	P-value (X^2 test)
Pre-intervention	58 (36.7)	46 (31.5)	0.339
Post-intervention	69 (43.6)	51 (34.9)	0.119
P-value (X^2 test)	0.070	0.374	

mobile unit less frequently than the control group (i.e., 27% vs. 53%, p<0.001).

We were interested in, "Why 5 women in the control group went for Pap smears?" The replies include: fear of cancer (3), due to a health volunteer's advice (1), and because an annual check-up was provided at work (1). The first three affirmed that they did not know the results of such investigations from other women in the intervention zone. Therefore, we are reasonably confident that there was no contamination between both groups.

The final analysis--based on the whole sample, including those who were previously excluded--assumed that screening coverages were similar to baseline practices. This comparison found slight increases in Pap test screening rates among both groups in the intervention zone (36.7 to 43.6%, p=0.070) and in the control zone (31.5 to 34.9%, p=0.374) (Table 4). Women in the intervention zone had a somewhat greater increase in Pap smear coverage rates from baseline, but the observed difference was of borderline statistical significance (36.7 to 43.6%, p=0.070). There was no significant difference between zones in either the initial (36.7 vs. 31.5%, p=0.339) or final coverage rates (43.6 vs. 34.9%, p=0.119). In conclusion, the intervention and control zones improved their Pap smear screening coverage rate without significant levels between the initial and final surveys.

Discussion

We undertook this study to determine whether a health professional--delivering a culturally sensitive education and invitation as an intervention at home--could improve the cervical cancer screening-coverage rates among women between 35 and 60 years of age from the inner-city Samliem community of Khon Kaen, Northeast Thailand. We found that the rate for women in the intervention zone tended to increase from baseline to follow-up interviews with borderline significance (36.7 to 43.6%, p=0.070). Interestingly, the rate also increased among the control group over the study period (31.5% to 34.9%, p=0.374). The differences were not statistically significant in all cases except that the control group proposed more mobile unit to encourage them to get a Pap smear (53 vs. 27%, p<0.001). We therefore found only a marginal positive effect of the intervention on cervical cancer screening coverage rates within the intervention group.

The results are disappointing as all 200 women actually need screening according to the Thai National Cervical Cancer Prevention Strategy--which recommends women between 35 and 60 have a cervical cancer screening test every 5 years--and yet the time lag since their previous Pap smear was more than 5 years at the time of the survey (May, 2006). This indicates that prevention is a low priority among this population, despite their proximity to a tertiary university hospital and its community-based health station which all provide Pap smear service.

Our sample, which lives near medical facilities, should reflect the highest coverage rate for inner-city women (34.2%) compared with other areas without any intervention (5%) (Srivatanakul, 2000). Moreover, this type of sample represents women who may actually be reached by health education programs when implemented in a non-research setting. Randomization of the sample resulted in nearly identical intervention and control groups. In addition to a coverage analysis using data obtained only from those subjects who completed the follow-up interviews, we conducted an analysis that included all previously excluded subjects. In this coverage analysis, we assumed that those women previously excluded still had the same screening coverage that they had reported in their baseline interviews (totally 4 months and not more than 5 years).

Our study findings, however, illustrates the need for a mobile unit even for those living nearby a hospital, since as high as 40% of respondents indicated that a proper occasion and sufficient time were the real determining factors for getting a Pap test. The two responses (1) nothing would encourage her to get a Pap smear except the right occasion (24.5%) and (2) the provision of a mobile unit (40%) perhaps explain why "no occasion" arose for 67% of the 200 women to get a Pap smear during the study period. This suggests that these Thai women were too busy to get a Pap test and that prevention is a low priority for them.

A mobile unit may be one of the best strategies for increasing screening coverage among Thai women because: (1) women think that nurses doing the procedure come from a hospital, not a health station, so feel more confident in the service; and, (2) this strategy provides an occasion for women near their home. A study conducted in rural Roi-et province, ~110 km to the east of Khon Kaen, used this strategy as a principle method for recruiting women in combination with advance appointments (RTCOG/JHPIEGO, 2003) with the result that screening coverage of women between 30 and 45 was >60% (Chumworathayi et al., 2006).

Increases in cervical cancer screening coverage rates in the control group as well as the intervention group suggest that some factors other than our intervention may have had an impact. These may have included community-wide cancer education and prevention programs sponsored by the Ministry of Public Health or the Khon Kaen Provincial Health Office and private insurance companies.

The "Hawthorne effect" may also have played a role as the baseline interview might have stimulated some participants to obtain screening tests (Gehlbach, 1993). It is perhaps not surprising that women in the control group also increased the rate at which they obtained Pap smears since the test is widely used, inexpensive, often ordered by physicians, and familiar to most Thai **women** (Gehlbach, 1993).

Two other studies (McAvoy et al., 1991; Sung et al., 1997) used face-to-face education and invitations at home as an intervention; however, our result was only similar to

the study by Sung et al. wherein an in-home education intervention had no effect on getting Pap smears. Their study was conducted among low-income, inner-city, African-American women perhaps comparable to our study sample. By contrast, McAvoy and Raza's result was that health education interventions increased the uptake of cervical cytology among Asian women who had never been tested. We suspect that the Asian women in Leicester constitute a very different socio-economic group from our sample.

We conclude that the use of culturally-sensitive, health education and home visit interventions are important. By themselves, however, these strategies are insufficient. Promoting health in developing country populations, like Thailand's, is particularly difficult because of the low priority of preventive services. Typical members of these populations are primarily concerned with their immediate needs; such that, health is a priority only in time of illness. Reaching this type of population with health promotion interventions will require additional strategies, such as: (1) sending out a mobile unit, (2) making advanced appointments, (3) using special holidays, (4) mass screening with friends, and/or (5) legislation. The key is creating opportunity.

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