IMPROVING PRE-PREGNANCY CARE (PPC) AMONG CLIENTS WITH DIABETES AND HYPERTENSION AT HEALTH CLINICS IN KUALA MUDA DISTRICT, KEDAH

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Abstract

Pre-pregnancy care (PPC) is a set of interventions used to identify and reduce women's risks during reproductive age, especially women with chronic illnesses to achieve a healthy pregnancy. It includes optimisation of care, advice on appropriate contraception, and lifestyle modification. Our project aims to increase the PPC registration percentage of women with diabetes and hypertension from 53% to 100%, hence increasing their chances of receiving appropriate PPC intervention.

Both the cards of diabetic and hypertensive clients were reviewed using the PPC assessment form where the percentages of registered clients, completeness of registration, and aspects of interventions were calculated. We developed a new standardised guideline with a refined registration process into our routine Non-Communicable Disease (NCD) Clinic. The new PPC guideline implementation was reassessed every three months for two cycles by our district PPC team.

Post-intervention, the percentages of diabetes and hypertension clients registered with PPC has increased to 79.2%. Furthermore, proper registration helped to increase the percentages of PPC intervention from 86.6% to 95.3%. The implementation analysis showed that the completeness of five registration components had increased significantly from 1.4% to 16.8%. All elements under optimisation of care showed a positive changed, from 65.1% to 85.6% for optimisation of treatment, 48% to 52.6% for contraception advice, and 30.2% to 44% for lifestyle modifications.

We conclude based on the findings of this study that a well-structured PPC guideline with a few modifications that enhanced the process efficiency was able to increase the PPC registration percentages of eligible women with diabetes and hypertension and in turn, increase their chances of getting appropriate intervention. Continuous assessment and periodic PPC courses for healthcare workers are essential to ensure the sustainability of the implementation.

KEYWORDS: Pre-pregnancy care, diabetes, hypertension, quality study

Problem

The implementation of pre-pregnancy care (PPC) is important to ensure a planned and safe pregnancy especially for high-risk reproductive-age women, to reduce maternal and foetal morbidity and mortality. PPC service was introduced to all health clinics under the Kuala Muda District Health Office (KMDHO) in 2011 but the implementation was very poor. There were no standard guidelines; hence, every clinic has its own way of running the PPC service which mainly focuses on post-natal clients. The Malaysian Perinatal Care Manual released in 2013 provides a general guideline of the PPC service, enlightening us on other possible entry points for PPC (1).

We examined data collected for PPC from 2013 to 2015. At that time, women registered with PPC were reproductive women aged 15 to 49 years who were screened for PPC and given appropriate intervention. Based on the record, active management given to the registered clients was not well documented. The total number of women screened for PPC had increased substantially from 5,469 in 2013 to 7,948 in 2015, showing a 45% increment. However, the percentages of clients with interventions were not only small, but has been declining from 18% in 2013, 15% in 2014 and 14% in 2015 (Figure 1). Limited data and the declining trend of PPC intervention indicated that our current PPC needs to be strengthened in terms of its overall process, data collection and monitoring aspect to allow for the impact assessment of PPC.

Kuala Muda District Health Office (KMDHO) serves a large district with high-density of a population estimated at 456,605 people (2). There are seven health clinics operated by 497 healthcare workers including doctors, paramedics, and support staff.

Among many medical problems in this district, the escalation of non-communicable diseases (NCD) in reproductive-aged women need to be addressed. When PPC was introduced in KMDHO, PPC screening was mainly

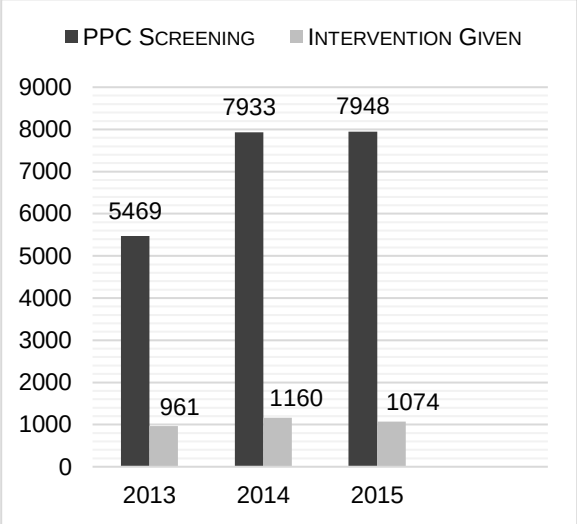


Figure 1: Percentages of screened PPC clients given an intervention

conducted among post-natal mothers from maternal and child health (MCH) clinic, while women with NCD were less screened and registered with PPC. We believed that PPC should focus more on NCD clients since they are facing a greater risk of uncontrolled diseases during conception. As such, PPC implementation should be improved further by shifting the main focus from MCH to NCD with the development of a well-structured process of care for all the health clinics. Since diabetes and hypertension are the main NCD representing the majority of NCD clients, focusing the PPC screening and intervention on them will render a greater effect in reducing unsafe pregnancy.

Our aim is to achieve a 100% PPC registration of eligible clients with diabetes and hypertension and provide them with at least one intervention, as outlined in our PPC. Achieving optimal control in the disease management such as having HbA1C equal or less than 6.5% (target is 30%), and blood pressure less than 140/90 mmHg (target is 50%) are considered added benefits of the PPC implementation. This project was conducted over a period of six months, divided into two PDSA (plan, do, study and act) for a cycle of three months each. The improvement was assessed by comparing the end result with the baseline findings.

Background

The Ministry of Health Malaysia (MOH) implemented the PPC as an initiative to reduce maternal morbidity and mortality among high-risk clients with medical conditions, such as diabetes, hypertension, asthma, and bad obstetric history. It focuses on preconception interventions for modifiable risk factors to improve maternal health and foetal outcome (1,3–5). Early recognition of potentially modifiable risks (6,7) among these women will help them to plan a safe pregnancy, optimise their disease control, and prevent poor pregnancy outcome (1,5,8). For women with non-modifiable risk factors, such as having a genetic disorder, PPC provides a platform for counselling where the women were informed of the potential risk so they could make informed decisions about their pregnancy plan (3). The major components of PPC are risk assessment followed by education and health promotion, and medical and psychosocial intervention (8,9).

In developing countries, including Malaysia, NCD is a major disease burden and the prevalence is increasing every year, especially for diabetes (10). The prevalence of diabetes is higher among reproductive-age women of 18 – 49 years old, which is between 5.5% to 22% (10). Studies have shown that adverse pregnancy outcome in women with diabetes was 3–5 times higher than other maternal population, including miscarriages, pre-term labour, macrosomia, foetal malformation, birth injury, perinatal mortality, pre-eclampsia, urinary tract disorder and neural tube defect (11–13). Evidence suggested that women receiving PPC have better glycaemic control, hence reducing serious congenital abnormalities (13,14).

Despite the encouraging evidence that supported PPC role in improving the outcome of a maternal and foetal high-risk group, PPC acceptance among healthcare providers and the community is still low (1,3–6). Studies suggested that primary healthcare played a major role in the PPC implementation (5,6,15–18), as the main healthcare providers in the community. However, the implementation of PPC is rather challenging. The barriers identified among General Practitioners (GPs) regarding PPC include clients' reluctance to come during the preconception stage, time constraints for consultation, addressing multiple preventive measures at a time, clients' unwillingness to attend subsequent PPC sessions and lack of tool or checklist for PPC (5,15,19). In addition, there were also challenges in attracting women to be involved in PPC as most of the women have low awareness of PPC (19). The most likely explanation for this was that the GPs might not have given adequate PPC counselling, sexual education and contraceptive methods (17). The women held the perception that PPC should be offered actively by the GPs during their routine consultation (5,19,20).

A successful PPC implementation required the involvement of many individuals, groups, and institutions (4,17). Each level has its own role. At the national level, MOH needs to formulate a national strategy to standardise the PPC delivery system and integrate PPC intervention packages into the existing local health programme (17). The system needs to be sustained with adequate human resources, low financial burden and has constant monitoring and evaluating procedures (4–6,17). Identifying at-risk population, planning an appropriate intervention and conducting an outreach programme to deliver PPC to urban African American women with the risk of poor birth outcomes in Georgia, USA, were shown to have a beneficial impact on the target group (8). The healthcare providers' motivation to implement PPC was also an integral part to ensure PPC success as demonstrated by the GPs in the Netherlands where 93% of the GPs perceived PPC as part of their job and their planned pregnancy achieved 85% (16). Therefore, the integration of multidisciplinary level is the key to a successful PPC.

Measurement

A pre-intervention study was carried out a month prior to the intervention implementation. The purpose is to ascertain the number of women with diabetes (DM), and hypertension (HPT) registered with PPC. A total of 649 clients' cards (334 diabetes cards and 315 hypertension cards) was randomly selected from all seven NCD clinics and reviewed using the PPC Assessment Form. Inclusion criteria were women aged 15 to 49 years with diabetes and hypertension who have not reached menopause stage or had undergone a bilateral tubal ligation (BTL) or total hysterectomy. The assessment provided data on the percentages of eligible reproductive age women with diabetes and hypertension registered under PPC and the percentage of interventions given to the PPC clients. Additional information collected was the type of interventions given, such as optimisation of care (which include either optimising medications or referral to appropriate personnel such as Family Medicine Specialist (FMS), dietician or hospital physician, advice or initiation of contraception, and advice on lifestyle modifications. Data collected were analysed using SPSS version 21.

Of all the 649 clients' cards reviewed, 344 (53%) samples were registered under PPC and among those who have registered, 298 (86.6%) were given at least one intervention as outlined in the PPC guidelines. Clients registered under PPC received more interventions compared to the non-registered client (Table 1). Among the interventions given, optimisation of care has the highest percentages of 75.2%, while advice on contraception and lifestyle modifications showed 47.8% and 30.2% respectively. Subsequent the pre-intervention study, the PPC assessment form was improved and to be used in the post-intervention phase.

The post-intervention assessment was carried out every three months for two cycles by our district PPC team which comprised three doctors and three nurses from different clinics. We collected and analysed the data at the end of the first cycle and evaluated all the processes involved in the remedial measures to be taken before commencing on the second cycle.

Table 1: Results of PPC in the pre-intervention phase.

	Registered PPC n (%)	**Non-registered PPC n (%)**
Total clients' cards reviewed (n= 649)	344 (53%)	305 (47%)
Number of clients received interventions	298 (86.6%)	205 (67.2%)
Types of interventions		
• Optimisation of care	224 (75.2%)	175 (85.4%)
Achieved target	87 (38.8%)	94 (53.7%)
HbA1C (≤ 6.5%)	8 (3.6%)	13 (7.4%)
Controlled BP	135 (60.3%)	127 (72.6%)
Referral to other specialities	41 (18.3%)	25 (14.3%)
• Advice/Initiation/Maintenance of contraception	165 (47.8%)	15 (4.9%)
• Advice on lifestyle modifications	104 (30.2%)	39 (12.8%)

Initial Assessment of the Problem

Based on the pre-intervention data, clients registered with PPC received more interventions compared to non-registered clients, inferring that registering the NCD clients with PPC improved their chances of receiving more interventions. However, variation in the registration process of each clinic and the lack of support from medical staff were a major concern. For the first step, we improvised the existing PPC flow-chart (Figure 2) based on the MOH PPC in Perinatal Care Manual (1). The refined flow-chart elaborated each step emphasising on the registration process and choices of intervention that is suitable for the client needs. Every clinic is required to form a PPC team which consists of a doctor and a nurse-in-charge who will liaise directly with the district PPC team.

Another step included under the registration procedures is the use of PPC registration kit to improve the clients' card traceability and proper history-taking. Following the registration, PPC clients are referred to a doctor for a quick history-taking, assessment and consultation to decide on the appropriate interventions. We divided the interventions into three different categories, namely optimisation of care, advice of contraception and advice on lifestyle modification. Optimisation of care can be achieved through the adjustment of the current treatment or referral to the proper personnel. At the end of this process, staff nurses will update clients of their next appointment to avoid defaulter.

Before embarking on the implementation of the new PPC flow-chart, we assessed the level of healthcare workers (HCWs) knowledge, attitudes and their current practice of PPC. A questionnaire was developed and validated before being distributed to a total of 157 HCWs who were involved in PPC, consisting of doctors, assistant medical officer (AMO) and nurses. The study revealed that 103 (65.6%) of the total participants had attended a PPC course in the past two years. Participants who attended the PPC courses had better results in terms of knowledge, practice and attitudes (Table 2). Therefore, a comprehensive PPC course is important to increase the level of awareness among our HCWs. Hence, ensuring a successful PPC implementation.

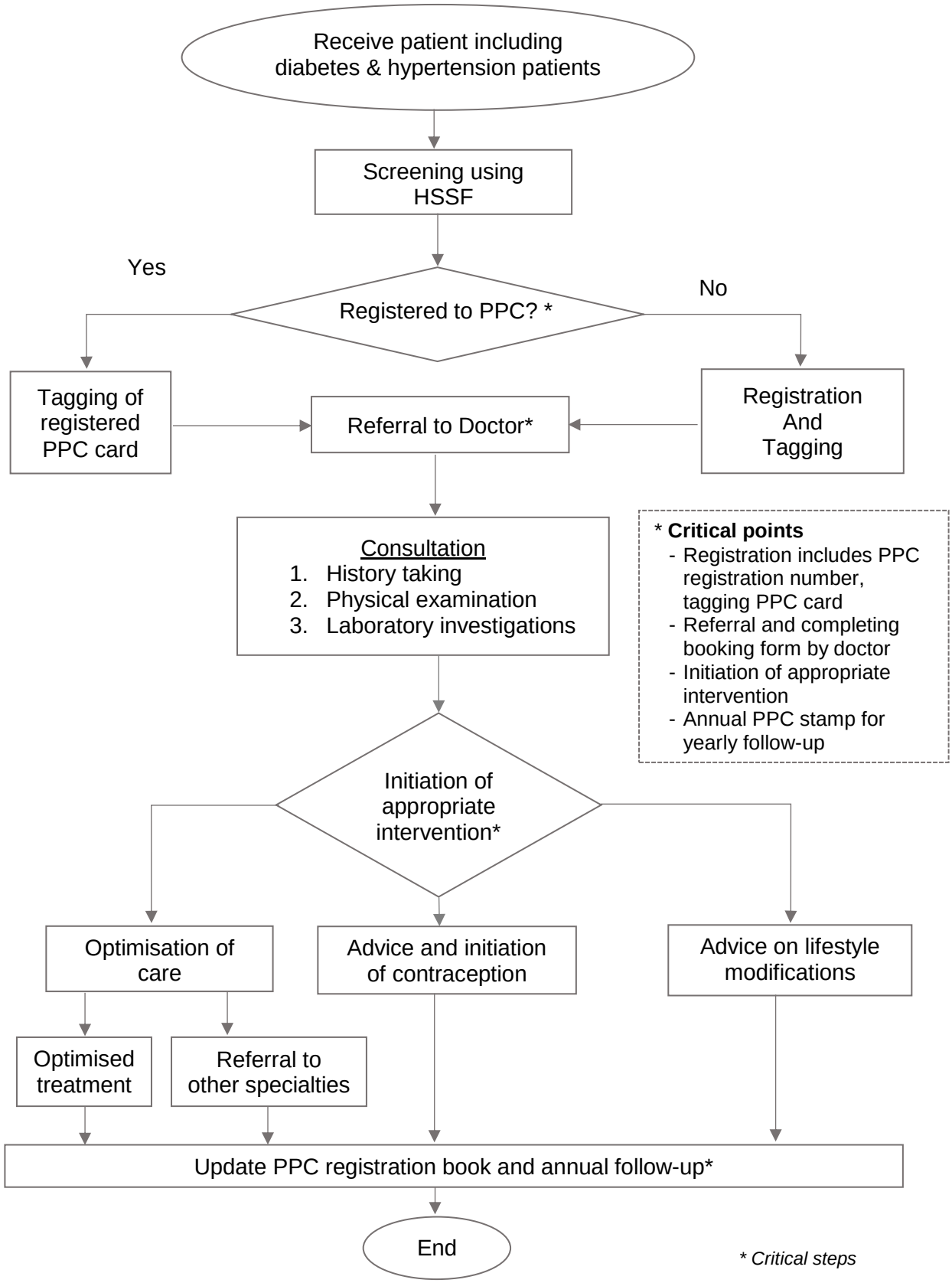


Figure 2: Improvised PPC flow-chart.

Table 2: KAP on PPC.

	Participants (n, %)		Total	*P*-Value
Training information on PPC in the past 2 years	Attended (103, 65.6%)	Not attended (54, 34.4%)	N = 157	
Scoring				
Knowledge				
Excellent (81-100%)	21 (20.4%)	7 (13%)	28 (17.8%)	
Good (61-80%)	**70 (68%)**	30 (55.6%)	100 (63.7%)	
Moderate (41-60%)	9 (8.7%)	15 (27.8%)	24 (15.3%	0.02
Poor (21-40%)	3 (2.9%)	1 (1.9%)	4 (2.5%)	
Very poor (0-20%)	0 (0%)	1 (1.9%)	1 (0.6%)	
Practice				
Excellent (81-100%)	5 (4.9%)	2 (3.7%)	7 (4.5%)	
Good (61-80%)	65 (63.1%)	14 (25.9%)	79 (50.3%)	< 0.01
Moderate (41-60%)	31 (30.1%	37 (68.5%)	68 (43.4%)	
Poor (21-40%)	2 (1.9%)	0 (0%)	2 (1.3%)	
Very poor (0-20%)	0 (0%)	1 (1.9%)	1 (0.6%)	
Attitude				
Positive	80 (77.7%)	28 (51.9%)	108 (68.8%)	
Neutral	16 (15.5%)	21 (38.9%)	37 (23.6%)	< 0.01
Negative	7 (6.8%)	5 (9.3%)	12 (7.6%)	

Strategy

Our project aims to improve the PPC service by registering 100% of women with diabetes and hypertension eligible for PPC and ensuring all registered clients receive at least one intervention addressing their medical problems. The Achievable Benefit Not Achieved (ABNA) for the percentages of clients who received intervention in the pre-intervention study was 13.4 which we intend to reduce to zero.

Prior to this project, a meeting was held with all designated PPC in-charge including doctors and nurses from all seven health clinics with regards to the project's goal and objectives and the introduction of the new PPC flow-chart. At the end of the meeting, they were given the registration kit to kick start the project. The person-in-charge was expected to do echo training at their respective clinic to increase the awareness on the PPC project and to monitor the implementation of PPC. The district PPC assessment team used the quality assurance model of Plan, Do, Study, Act (PDSA) cycle to ensure adequate time allocation for the implementation of the modified flow-chart.

PDSA cycle 1: The first phase of our project is meant to strengthen the PPC registration process and PPC intervention by introducing the PPC Registration Kit. The PPC registration kit includes a tag sticker, a stamp and a Booking Form. Tagging sticker was introduced to improve clients' card traceability and a booking form is developed

to shorten the process of history-taking by the doctor given the limited consultation time. We hoped that by using the tagging sticker on the client's card, doctors would be more alert of the PPC components during the consultation. The Health Status Survey Form (HSSF), a general questionnaire on one's health status was used during the registration process to identify any other risk factors apart from diabetes and hypertension. The PPC stamp was created mainly to ensure a continuation of the yearly follow-up for family planning and plan for optimisation of care.

At the end of the PDSA cycle one, our district PPC team did a post-intervention evaluation on clinics other than their respective clinic to avoid bias. In view of our initial plan of evaluating the adherence to PPC registration, we randomly selected 20 registered PPC cards from each clinic for the assessment. A total of 140 clients' cards were assessed and the findings were disappointing. Only 1.4% completed all five registration components and the number of interventions received by the registered PPC clients was 70%. The poor results of cycle one was due to the inconsistency in the adherence to the new flow-chart, lack of commitment from PPC in-charge and lack of awareness among doctors regarding the newly implemented PPC, especially in completing a booking form, HSSF and PPC stamp. Random interviews with the doctors revealed that most of them were still unaware of the PPC flow-chart mainly due to the lack of echo training at the clinic level, leading to poor adherence to the registration process.

PDSA Cycle 2: In the second cycle of PDSA, we conducted a PPC roadshow for all of the seven health clinics. During the PPC roadshow, the doctors were briefed on the PPC implementation by the district PPC team. Continuous reminders were given to the clinic focal PPC in-charge. Regular surveillance was done by the district PPC team at their respective clinic to ensure the adherence to the flow-chart. At the end of the PDSA cycle two, we conducted a second post-intervention review, assessing 780 clients' cards.

Results

We audited 140 registered PPC clients' cards in the first cycle and 780 cards among eligible PPC clients in the second cycle. The percentage of eligible clients registered with PPC increased from 344 (53%) pre-intervention to 618 (79.2%) in cycle two. There were no data for the percentage of registered clients for PDSA cycle one since this cycle was meant to assess the adherence to the registration process. The comparison between pre-intervention results with PDSA cycle one showed a decline in the percentage of intervention given from 86.6% to 70% and a decline can be seen in other parameters as well. However, after the re-evaluation and corrective measures were taken, the second PDSA cycle showed an increase in the percentage of intervention given to clients, that is from 70% to 95.3%, which reduce the ABNA gap to 4.7 (Figure 3).

Completeness of registration (the 5/5 components that consist of the registration number, tagging, BSSK, booking form and PPC stamp) improved from 1.4% to 16.8%. The results comparison between the pre-intervention study and PDSA cycle two reveal that optimisation of care increased from 75.2% to 85.6%, advice or use of contraception, from 47.8% to 52.6% and advice on lifestyle modifications, from 30.2% to 44%. The complete results of the three studies are presented in Table 3.

Table 3: Summary of results for pre and post-intervention cycles.

	Pre-Intervention Study (N=649)	PDSA Cycle 1 (N=140)	PDSA Cycle 2 (N=780)
Total clients registered	344 (53%)	140(100%) *	618 (79.2%)
Completeness of Registration			
0/5 complete	Not applicable	1 (0.7%)	0 (0%)
1/5 complete		0 (0%)	36 (5.8%)
2/5 complete		79 (56.4%)	242 (39.1%)
3/5 complete		45 (32.1%)	162 (26.2%)
4/5 complete		13 (9.3%)	74 (12.0%)
5/5 complete		2 (1.4%)	104 (16.8%)
Number of Intervention received**	298 (86.6%)	98 (70%)	589 (95.3%)
1 Intervention	139 (15.4%)	56 (40%)	243 (39.3%)
2 Interventions	104 (30.2%)	36 (25.7%)	155 (25.1%)
3 Interventions	48 (14.0%)	6 (4.3%)	191 (30.9%)
Types of interventions:			
• Optimisation of care	224 (75.2%)	44 (31.4%)	529 (85.6%)
Achieved target	87 (38.8%)	3 (2.1%)	186 (35.2%)
HbA1C (≤ 6.5%)	8 (3.6%)	3 (2.1%)	25 (4.7%)
Controlled BP	135 (60.3%)	63 (45%	321 (60.7%)
• Referral to other specialties	41 (18.3%)	8 (5.7%)	40 (7.6%)
• Advice/ Initiation of contraception	165 (47.8%)	55 (39.3%)	325 (52.6%)
• Advice on lifestyle modifications	104 (30.2%)	48 (34.3%)	272 (44%)

**PDSA Cycle 1 assessed 140 registered clients' cards to analyse the adherence to PPC flow-chart.*
*** PPC clients received any one of the interventions suggested.*

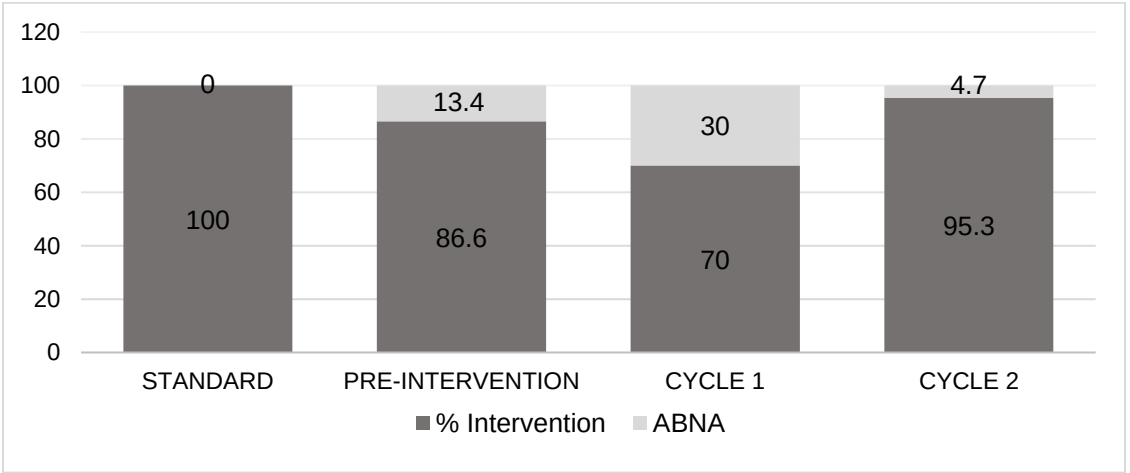


Figure 3: ABNA percentage of intervention.

Lessons and Limitations

Similar to any other projects, this project encountered several shortfalls during the implementation phase. The main lesson learnt from this project was the importance of embracing the PDSA process as it could assists in the identification of any flaw in the study design and unexpected results.

After the first PDSA cycle, we noticed that our intention to evaluate the adherence to the new PPC flow-chart by assessing only a small number of registered PPC clients led to an inconsistent of data collected, which prevent the comparison of data from pre-intervention and PDSA cycle two. The small number of samples might affect the PDSA cycle one results. Therefore, in the second cycle of PDSA, we increased the number of cards assessed to strengthen the quality of the study.

Furthermore, we learned that a strong multidisciplinary communication team need to be established before embarking on any project. This is to ensure that the trained personnel would conduct an echo training to all HCW at their respective clinics and convey any updates. Therefore, we arranged for a series of roadshows by visiting each health clinic and educating all doctors. In view of the rapid turn-over of doctors, we need to incorporate PPC in courses provided by KMDHO for a more sustainable implementation at the clinic.

The study also has several limitations. The lack of human resource, heavy workload and other competing tasks were among the challenges that we encountered. For some of the HCWs, the introduction of the new preventive measures in PPC added burden to their daily task. Therefore, continuous motivation is needed. Dedicated staff should be assigned to ensure the sustainability of PPC.

Our study only focused on modifying the PPC implementation and we did not look at client factors that might have influenced the success of PPC. Client willingness to participate and share information with HCWs regarding their planned pregnancy promotes the planning of a safe pregnancy and the initiation of folic acid. Community awareness programmes that promote PPC need to be organised by the clinic in conjunction with the clinic health panel (*Panel Kesihatan*) or other local non-governmental organisations (NGO).

The impact of the PPC implementation on reducing unplanned pregnancies with poor NCD control cannot be studied at the time due to unavailability of data on reproductive-age women with underlying NCD who became pregnant and their control status during antenatal booking. To overcome this issue, we have started collecting data on pregnant NCD patient assessing their status of PPC and their disease control prior to pregnancy. We hope that the data will give us some insight into the effectiveness of PPC implementation.

Finally, as the study was carried out at the end of the year, a refresher PPC course for our HCWs could not be done due to financial constraint. Having a scheduled refresher course will increase their knowledge, improve their practice at the health clinics and probably yield some positive attitudes towards implementing PPC.

Conclusion and the Next Steps

PPC role is imperative in improving the maternal and foetal outcomes through a series of interventions aimed to achieve safe pregnancy especially for high-risk mothers. For the first step in creating a strong platform for the PPC implementation with a bigger impact, our project has shifted the focus of PPC entry point from post-natal mother to women in reproductive age with NCD. This is because women with underlying NCD pose a greater risk if they got pregnant with poorly controlled care. Therefore, we focused on diabetes and hypertensive clients as they represent the majority of NCD cases among reproductive women.

The strategies implemented managed to increase the registration percentage of diabetes and hypertension clients with PPC from 53% to 79.2% whilst PPC clients receiving intervention increased from 86.5% to 95.3%. From the study, we can conclude that a structured PPC flow-chart with a few

modifications can help us achieved the study objectives. This project could also be extended to other NCDs as well, such as bronchial asthma, thyroid disorder and heart disease. In order to ensure the 100% of registered PPC clients received any one of the interventions, strict adherence to the new PPC guideline is of utmost importance. Continuous periodic assessment on the compliance with the process of care as well as a scheduled refresher PPC course is crucial to ensure the sustainability of PPC implementation.

Further studies are needed in the future to assess the impact of the PPC implementation on the health of maternal and foetal. We might look into the trend of planned or unplanned pregnancy among women with NCD and assess their risk by looking at their disease control during antenatal booking.

Currently, KMDHO has become a reference point for the PPC implementation in Kedah and the Ministry of Health Malaysia is presently adopting our PPC flow-chart to develop a national PPC guideline for all health clinics in Malaysia.

Acknowledgement

The authors would like to thank the Director General of Health Malaysia for his approval to publish this work. Our appreciation also to Kedah Health State Department and staff of PKD Kuala Muda.

Conflict of Interest

None

Funding

None

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EFFECTIVE STRATEGIES TO IMPROVE THE UPTAKE OF PAP SMEAR SCREENING IN PONTIAN DISTRICT

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Abstract

Pap smear screening is proven to be an effective tool for the early detection of cervical cancer. Public Health Laboratory of the Ministry of Health Malaysia (MOH) reported that Pontian Health District achieved only 69.4% out of the 4,112 targeted Pap smear screening performed in 2014. Pontian District Health Office conducted a Quality Assurance (QA) project, aiming to increase the percentage of Pap smear screening uptake among women in Pontian district to 100%.

A cross-sectional study using questionnaires was conducted in January 2015 involving 256 women to measure their knowledge, attitude, and practice towards Pap smear screening. The results showed 93.8% of respondents have a good knowledge of Pap smear. However, only 72% agreed to do Pap smear screening while 28% refused to do the screening. The 72 women declined the Pap smear screening for various reasons, such as time constraint (27%) feeling shy (27%), perceived the procedure as painful (23%), afraid to know the result (19%) and perceived the screening as unimportant (4%). The results also revealed only 44% of the respondents received information about Pap smear screening from health staff.

Several strategies were identified to overcome the reasons; the expansion of Pap smear screening to the workplace and residences overcome time constraint issue, an innovative tool known as *"Sisih Malu"* to combat the shyness feeling of doing Pap smear screening, while *"Celik Servik"* demonstrates the procedure as simple and painless. Active promotion of Pap smear screening was also conducted by the clinics' staff who emphasised on cervical cancer early detection, which is more treatable at an early stage. These improvement strategies were conducted from February until December 2015.

Post-intervention saw Pap smear screening in Pontian district increased to 4,936 (118.9%), exceeding the 4,152 target set for 2015 and increased 130.5% in 2016. Another survey among 99 women in January 2016 showed that a 100% willingness to undergo a Pap smear screening.

KEYWORDS: Pap Smear, coverage, improvement

Problem

Cervical cancer remains a major threat to the health and life of Malaysian women and there is a need for early detection and management of cervical cancer. The proven screening method for early detection of cervical cancer is cervical cytology examination, typically referred to as the Pap smear examination. Thus, in 1969, Family Health Development Division established the cervical cancer screening programme, which was incorporated into the Maternal and Child Health programme of MOH, Malaysia. The programme was planned, organised and evaluated by the Family Health Development Division. Every year MOH gives a certain target for a total Pap smear screening for each state and district level according to the estimated women population which was obtained from the Health Information Centre, MOH. At the state level, Family Health Officer plans and coordinates activities related to Pap smear screening in which each district was given a target in terms of the number of Pap smear screening to be performed in a year. The target was then divided accordingly among different health clinics in the district. Pap smear screening is carried out by the Medical and Health Officers and Public Health Nurses and the smears were read by a trained Medical Laboratory Technologist at Public Health Laboratories.

The annual target for every district was set at 40% of the 1/3 estimated sexually active women of childbearing age. It was estimated that the population of women aged between 30 and 65 years in Pontian district for the year 2014 was 39,153 of which 76.14% was sexually active. This means that 4,112 women in Pontian district were expected to be performing the Pap smear screening in 2014. The standard given by the Johore State Health Department was 100%. Pontian District Health Office was not able to achieve the target since 2012 as shown in Figure 1.

The Quality Assurance project aimed to increase the percentage of Pap smear screening from 69.4% to 100% in Pontian district within one year.

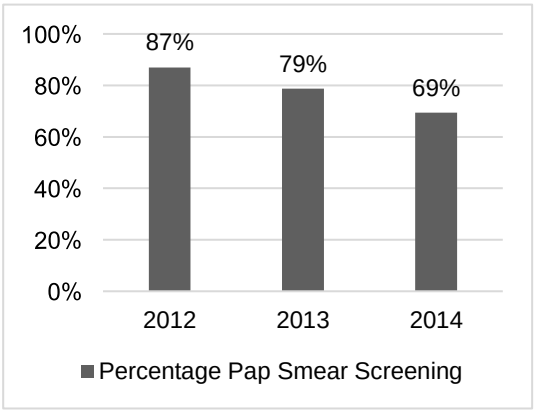


Figure 1: Trend of Pap smear screening (%) for Pontian district (2012 - 2014).

Background

Cervical cancer remains a major threat to the health and life of Malaysian women. It remained as the second contributor to cancer-related death after breast cancer in Malaysia (1). It was estimated that two women died of cervical cancer every day and 30% of the cervical cancer cases were detected at stage 3 and 4. Women who had never been screened or who have not been screened in the past five years face a greater risk of developing invasive cervical cancer (2). The proven screening method for early detection of cervical cancer is the cervical cytological examination using the Papanicolaou's stain, which is also known as the Pap smear examination. Pap smear screening was found to be cost-effective and useful for early detection of cervical cancer in women. The slow evolvement of cervical cancer through a latent period of 10 years makes early detection of this cancer possible and practical. Population-based cervical cytology screening programme offering the Papanicolaou testing every three to four years has reduced cervical cancer incidence and increased the mortality rate by up to 80% in developed countries in the last five decades (3). It was 100% treatable if cervical cancer was detected at an early stage. Subsequently, it prevents further metastasis and mortality caused by late detection. Early detection also reduces the cost of treatment.

A study by Yeo et al. showed that the demography, women's beliefs of the

effectiveness of Pap smear in detecting cervical cancer, the desire to detect health problems early and the perception on Pap smear being painful, were found to be the factors that significantly influencing Pap smear uptake(4). Healthcare professionals need to be mindful of these factors when encouraging women to undergo this procedure.

There are a few studies on the strategy to increase Pap smear screening. Marion M et al. stressed on the importance of building awareness and motivation for cervical cancer screening through various activities, such as continuous education, hosting screening events, specifically for women, improving the attitude and service of health care providers, and promoting screening tools (5). A study by Rebecca A et al. suggested that the use of letters or physician reminders and Human Papilloma Virus self-sampling might increase cervical screening uptake in young women (6). Another study by Amelia A et al. confirmed that using individual contact method and assigning a fixed screening date notably increased the participation in screening and the response was strongly dependent on age (7).

Measurement

The percentage of women who underwent Pap smear was chosen as the measure for this project and was calculated as the number of women who underwent Pap smear screening per total number of women targeted for Pap smear screening. The target was set at 100% given by Johor State Health Office for all districts in Johor. The targeted Pap smear screening for Pontian Health Office was 4152 for the year 2015. The monthly data of the number of women who underwent Pap smear screening were obtained from reports submitted by health clinics and Public Health Laboratory Johor Bahru. An assigned nursing manager of each clinic submitted the report electronically to the district office using a standardised format provided by MOH. The Public Health Laboratory was responsible for submitting the monthly statistic on Pap smear to the district health officer. Reports were compiled by the district matron and subsequently sent to the State Health Department.

Initial Assessment of the Problem

This one year project started in January 2015 and involved all eight health clinics and 33 community clinics in Pontian district. The first evaluation was carried out in December 2015 and was subsequently monitored yearly. A cross-sectional study to identify the contributing factors was conducted in January 2015 involving 256 reproductive women aged from 20 to 60 years using a pre-developed questionnaire, which consisted of four components, namely socio demography and socio-economic features, knowledge, attitude, and practices towards Pap smear screening. The sample was taken among women attending eight health clinics in Pontian district to accommodate for any heterogeneity. There were two questions on knowledge, three questions on attitude and four questions on practice towards Pap smear screening. The study showed that 93.8% of respondents had knowledge of Pap smear screening and 72% of the respondents agreed to do a Pap smear screening. Seventy two (28%) respondents did not agree to do a Pap smear screening because of time constraint (27%), shyness (27%), perceived the procedure as painful (23%), afraid of knowing the result (19%) and perceived the screening as unimportant (4%). Only 44% of respondents received information about Pap smear screening from healthcare providers. The results showed that age, educational status, duration of the marriage and the number of children were significant factors associated with Pap smear screening (p<0.05). The results also showed that the percentage of Pap smear screening was low among women aged 21 to 30 years old with high educational level, those who were married for less than five years, and have less than three children.

Strategy

Group members of this project identified several strategies to overcome the contributing factors of the low

percentage of Pap smear screening uptake. These strategies were implemented from February to December 2015. The issue of time constraint highlighted by the respondents was addressed by extending the Pap smear screening programme to the respondents' workplace and residence. Pap smear screening which was previously confined to health clinics only was also offered at the community clinic level. A dedicated room for Pap smear was provided in health clinics to facilitate clients to undergo the Pap smear screening, hence reducing the waiting time significantly.

Malaysian women are known to be shy when it comes to the private part examination. An innovative device called *"Sisih Malu"* was created to overcome shyness of braving the procedure. An oval hole (measuring at 9 inches × 7 inches) was made at the centre of a disposable green crepe paper (measuring at 39 inches × 39 inches) which costs only MYR 0.94. During the procedure, the Paper covered the lower part of the client's body and exposed only the private part. The nurse will explain to the client how to apply the *"Sisih Malu"* tool and the client will be left on her own to undress and apply the cover. The client has the privilege to call the nurse once she feels ready. After applying the *"Sisih Malu"* the client would call the nurse and the Pap smear procedure would be performed immediately. Once the Pap smear procedure was completed, the nurse will leave the client to dress on her own and once the client is ready she will be given further advice (Figure 2). The green Paper will be disposed of after use. This innovation helped to reduce clients' shyness during Pap smear screening.

Although women can be educated, many are not aware of the benefit of the cervical cancer procedure. Thus, an innovation called *"Celik Servik"* was developed as an educational tool to guide women on the Pap smear procedure. *"Celik Servik"* is a transparent model of a cervix. It was created using a plastic cup which represents the vagina and an inverted pacifier at the bottom of the plastic cup represents the cervix. The cup is translucent so that a client can see how the procedure is conducted during a demonstration. By using this model, we are able to convince clients that the Pap smear procedure is not painful. This is a low-cost innovation that costed only MYR 5 per model. Recycled plastic cups can also be used to further cut the cost. This model can be made in various sizes and can be easily brought anywhere for demonstration purposes.

Some women were afraid to know the result of their Pap smear screening. In such cases, explanation was given to the client on the importance of Pap smear screening for early detection of cervical cancer which is highly treatable if detected early.

Another strategy was to increase the promotion of Pap smear screening as our study showed that only 44% of the respondents have received information on Pap smear screening from healthcare workers. The approach is rather opportunistic in which advice on Pap smear screening was given in the outpatient clinic setting, during a postnatal home visit, during a community event or health camp. We focused on women aged between 21 and 30 years who have high education level, with the duration of marriage less than five years, and have less than three children. After a briefing on Pap smear screening was given, the client's card will be tagged in pink to indicate that the client has been briefed, thus, avoiding a repetition.

The initial and modified process flow for performing a Pap smear is shown in Figure 2. The initial process was modified by adding two activities: i) a promotion on Pap smear screening using *"Celik Servik"* innovative tool and ii) using the innovation of *"Sisih Malu"* during a Pap smear procedure

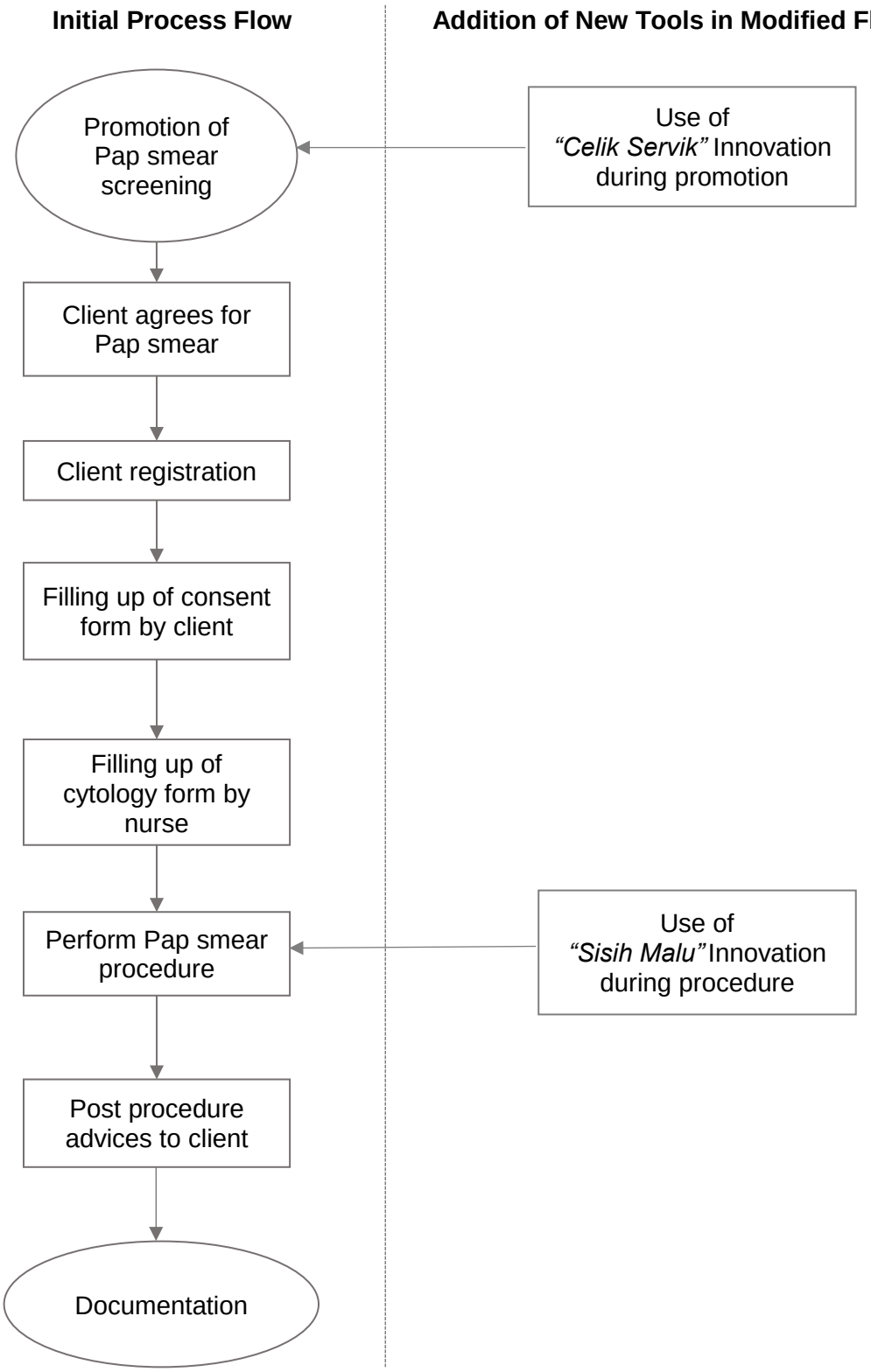


Figure 2: Modified flow-chart for Pap smear screening procedure using *"Celik Servik"* and *"Sisih Malu"* innovation.

Results

An evaluation was conducted on December 2015, one year following the intervention. Pap smear screening percentage has increased to 4,936 (118.9%), exceeding the 4,152 target for the year 2015 (Figure 3). Close monitoring showed that the performance continues to increase and exceed the target in the subsequent years, which proved that the strategies are sustainable.

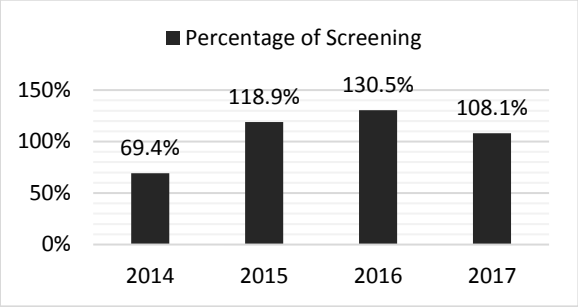


Figure 3: Percentage of Pap smear screening for Pontian district from the year 2014 to 2016.

Both the strategies of *"Celik Servik"* and *"Sisih Malu"* were able to improve the target set for Pap smear screening. The results of Pap smear screening for 2017 showed only Pontian district exceeded (108.1%) the target set while the other nine districts in Johor achieved less than 100%.

Detection of an early stage of cervical cancer has also increased concurrently with the increased number of Pap smear screening. Forty cases were detected in 2015 as compared to 27 cases in 2014 and no late-stage cervical cancer was detected in 2015 via the Pap smear screening programme. A post-interventional survey using the same questionnaire was conducted in January 2016 among women and the result is shown in Table 1.

Table 1: Comparison of factors affecting consent for Pap smear screening before and after interventions.

Factors	Before QA project (n=256)	After QA project (n=99)
1. Did not agree to undergo Pap smear screening	28%	0%
2. No time for Pap smear screening	27%	11%
3. Shy to undergo Pap smear screening	27%	0%
4. Think Pap smear screening is painful	23%	0%

Lessons and Limitations

The key learning point of this project is that simple and low-cost innovation coupled with continuous promotion of the importance of Pap smear screening could be the success factor in increasing the uptake of Pap smear screening. Notably, this study is only applicable to women who seek treatment or services at the health clinic as indicated by the sampling method. Ideally, the sampling should cover the entire community so that the results can be generalised. Another major challenge of this study is the high turnover rate among nursing staff in Pontian district.

We continuously educate new staff about the interventions to ensure the sustainability of this project. If we were to undertake this project again, we plan to broaden the promotion of Pap smear screening to cover government and private hospitals and private clinics in order to reach a greater proportion of the community.

Conclusion and the Next Steps

This project has shown its sustainability since it started in 2015 until 2017 where the percentage of Pap smear screening for Pontian District Health Office exceeded the target of 100%. Our project team has appointed a number of champions in the team to ensure the continuation of the project and to expand it to other districts. This project might help to reduce the cost of treatment for cervical cancer patients by increasing the chance of cervical cancer early detection. In October 2017, this project was expanded to all districts in Johor. We aim to

replicate this project to other states in Malaysia.

Acknowledgement

We would like to thank the Director General of Health Malaysia for his permission to publish this article and all the nursing staff of Pontian Health Office for their involvement and contribution to this project.

Conflict of Interest

None

Funding

None

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