นิพนธ์ต้นฉบับ

The effectiveness of chicken model training programme for subdermal contraceptions.

Suvit Bunyavejchevin*
Kobchitt Limpaphayom* Damrong Reinprayoon*
Kitpramuk Tantiyaporn* Wirach Wisawasukmongchol*

Bunyavejchevin S, Limpaphayom K, Reinprayoon D, Tantiyaporn K, Wisawasukmongchol W. The effectiveness of chicken model training programme for subdermal contraception. Chula Med J 1996 Jan; 40(1): 23-32

Objective : *To compare the effectiveness of a chicken model subdermal contraception training programme and a conventional programme of the Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University.*

Study design : *Experimental study (randomized controlled trial)*

Setting : *Family Planning Clinic, Chulalongkorn Hospital*

Subjects : *Sixty sixth-year medical students studying in the Obstetrics and Gynecology Department from April 1993 to October 1994.*

Intervention : *After a pre-test was done, sixty sixth-year medical students were randomly allocated into two groups, 1 and 2. Group 2 was assigned to have lectures in general principles of family planning, a review of subdermal contraception methods video tape review of insertion steps, chicken model insertion training practice and evaluation of the chicken model. Group 1 received the conventional programme (which was comprised of lectures in general principles in family planning only). Then both groups practice with real acceptors under the supervision of first-year residents. They were evaluated by check-list evaluation forms in which every critical step had to be done*

*Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University.

correctly. Post-tests and questionnaires were given before leaving the department. The acceptor's satisfaction was also evaluated and a one-week follow-up was arranged.

Main outcome measures : *Evaluation of the second, third and fourth acceptors by check-list evaluation forms, the mean of pre and post-test scores, the mean operative time, and the satisfaction scores of the second acceptors and medical students.*

Results *The proportion of sixth-year medical students passing the 2 nd acceptors evaluation in group 2 was significantly higher than in group 1 (67 vs. 90%) ($p<0.05$). There were significant differences of mean scores of the post-test (73.3 $\pm$ 12.5 vs. 87.3 $\pm$ 8.2) and differences of pre and post-test scores (10.7 $\pm$ 12.5 vs. 25.5 $\pm$ 13.9) when compared between the two groups ($p<0.01$), while the pre-test scores were not (63.0 $\pm$ 12.5 vs. 61.7 $\pm$ 12.9). The mean operative time was significantly higher in group 1 (13.6 $\pm$ 4.1 vs. 8.3 $\pm$ 2.6 min.) ($p<0.01$). There was no difference in the mean of satisfaction scores of the medical students in both groups (3.2 $\pm$ 0.8 vs. 3.4 $\pm$ 0.5) while the acceptor's satisfaction scores were significantly higher for group 2 (2.7 $\pm$ 0.8 vs. 3.4 $\pm$ 0.6) ($p<0.01$). There were no serious complications found in this study.*

Conclusions : *The chicken model training programme was more effective than the conventional programme. It helped the sixth-year medical students improve their skill and knowledge, and it provided more satisfaction to the acceptors. The chicken model is cheap and easily prepared. Regular use of this programme is encouraged from this study.*

Key words : *Subdermal contraceptions, Training.*

Reprint request : Bunyavejchevin S, Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.

Received for publication. September 15,1995.

สุวิทย์ บุณยะเวชชีวิน, กอบจิตต์ ลิมปพยอม, ดำรง เหรียญประยูร, กิจประมุข ตันติยาภรณ์, วิรัช วิศวสุขมงคล. ประสิทธิผลของการฝึกหัดฝังยาฝังคุมกำเนิดโดยใช้ไก่สดเป็นหุ่นจำลอง. จุฬาลงกรณ์เวชสาร 2539 มกราคม; 40(1): 23-32

วัตถุประสงค์ *เพื่อเปรียบเทียบประสิทธิผลของโปรแกรมการฝึกหัดฝังยาฝังคุมกำเนิดโดยใช้ไก่สดเป็นหุ่นจำลองกับโปรแกรมการฝึกหัดตามปกติของภาควิชาสูติศาสตร์-นรีเวชวิทยา คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย*

ชนิดของการทำวิจัย *การวิจัยแบบทดลอง*

สถานที่ที่ทำวิจัย *หน่วยวางแผนครอบครัว รพ.จุฬาลงกรณ์*

กลุ่มตัวอย่าง *นิสิตแพทย์ปีที่ 6 ที่ชั้นปฏิบัติงานบนภาควิชาสูติศาสตร์-นรีเวชวิทยา ระหว่างเดือนเมษายน พ.ศ.2535 ถึง ตุลาคม พ.ศ.2536 จำนวน 60 คน*

การกระทำ *แบ่งนิสิตแพทย์ปีที่ 6 เป็น 2 กลุ่มๆ ละ 30 คน โดยวิธีสุ่มตัวอย่าง โดยกลุ่มที่ 1 จะได้รับการฝึกตามโปรแกรมปกติของภาควิชา ฯ คือ ฟังบรรยายความรู้ทั่วไปเกี่ยวกับงานวางแผนครอบครัว กลุ่มที่ 2 จะได้รับการฟังการบรรยายประกอบสไลด์ ทบทวนความรู้ทั่วไปเกี่ยวกับงานวางแผนครอบครัวและยาฝังคุมกำเนิด, วิดีทัศน์ขั้นตอนการฝังในผู้รับบริการจริง, การฝึกหัดฝังในหุ่นจำลองไก่สดและประเมินผลในหุ่นจำลอง จากนั้นทั้งสองกลุ่มจะฝึกปฏิบัติในผู้รับบริการจริง โดยในผู้รับบริการรายแรกแพทย์ประจำบ้านปีที่ 1 สาธิตให้ดู 3 หลอดแรก, นิสิตแพทย์ฝึกปฏิบัติใน 3 หลอดที่เหลือ ทำการประเมินผลในผู้รับบริการรายที่ 2, 3, 4 และทำแบบทดสอบก่อนการฝึกหัดและหลังเสร็จสิ้นการปฏิบัติงานบนภาควิชา*

ตัววัดผลที่สำคัญ *การประเมินผลในผู้รับบริการรายที่ 2, 3, และ 4 โดยแบบประเมินชนิดมาตราฐานที่จัดทำไว้, ค่าเฉลี่ยของคะแนนขอบแบบทดสอบก่อนและหลังเวลาที่ใช้ในการผ่าตัด, ความพึงพอใจของผู้รับบริการและผู้ฝึกหัด*

ผลการวิจัย *สัดส่วนของนิสิตแพทย์ปีที่ 6 ที่ผ่านการประเมินผลในผู้รับบริการรายที่ 2 ของกลุ่มที่ 2 สูงกว่ากลุ่มที่ 1 อย่างมีนัยสำคัญทางสถิติ (90 vs. 67%) ($p<0.05$), ค่าเฉลี่ยของคะแนนแบบทดสอบหลังในกลุ่มที่ 2 (87.3 $\pm$ 8.2) สูงกว่ากลุ่มที่ 1 (73.3 $\pm$ 12.5) และค่าเฉลี่ยของผลต่างของคะแนนของแบบทดสอบก่อนและหลังในกลุ่มที่ 2 (25.5 $\pm$ 13.9) สูงกว่ากลุ่มที่ 1 (10.7 $\pm$ 12.5) อย่างมีนัยสำคัญทางสถิติ ($p < 0.01$), ในขณะที่ค่าเฉลี่ยของคะแนนแบบทดสอบก่อนของกลุ่มที่ 1 (63.0 $\pm$ 12.5) และ กลุ่ม ที่ 2 (61.7 $\pm$ 12.9) ไม่แตกต่างกัน, ค่าเฉลี่ยของเวลาที่ใช้ในการผ่าตัดในผู้รับบริการรายที่ 2 ของกลุ่มที่ 1 (13.6 $\pm$ 4.1 นาที) สูงกว่าในกลุ่มที่ 2 (8.3 $\pm$ 2.6 นาที) อย่างมีนัยสำคัญทางสถิติ ($p < 0.01$), ค่าเฉลี่ยของคะแนนความพอใจของนิสิตแพทย์กลุ่มที่ 1 (3.2 $\pm$ 0.8) และกลุ่มที่ 2 (3.4 $\pm$ 0.5) ไม่แตกต่างกัน, ขณะที่ค่าเฉลี่ยของคะแนนความพอใจของผู้รับบริการในกลุ่มที่ 2 (3.4 $\pm$ 0.6) สูงกว่ากลุ่มที่ 1 (2.7 $\pm$ 0.8) อย่างมีนัยสำคัญทางสถิติ ($p < 0.01$)*

สรุป *การฝึกหัดฝังยาฝังคุมกำเนิดในไก่สดร่วมกับโปรแกรมปกติของภาควิชาฯ มีประสิทธิผลดีกว่าการฝึกหัดตามปกติของภาควิชา ช่วยเพิ่มทักษะ, ความรู้และความพอใจต่อผู้รับบริการมากกว่า หุ่นจำลองไก่สดมีราคาถูก, หาได้ง่าย โปรแกรมการฝึกหัดฝังยาฝังคุมกำเนิดด้วยวิธีนี้ในนิสิตแพทย์ปีที่ 6 ที่ผ่านการฝึกหัดทางศัลยกรรมมาแล้วควรได้รับการเผยแพร่ต่อไป*

Subdermal contraceptions (Norplant(R)) take advantage of the tissue compatibility of nonbiodegradable silicone rubber capsules. The contraceptive steroid levonorgestrel slowly diffuses through six slender, flexible capsules.[1] When the capsules are removed, the contraceptive effect wears off quickly. Each set of Norplant capsules contains 35 mg of levonorgestrel which is released at a low steady rate of 85 mcg daily initially, decreasing to 50 mcg daily at 9 months and 35 mcg at 18 months, with a further decline thereafter to 30 mcg per day.[2] Norplant prevents pregnancy by inhibitinging ovulation, thickening and decreasing the amounts of cervical mucous, creation of a thin and atrophic endometrium and premature luteolysis.[3-5]

In 1977, the Thai Ministry of Public Health studied the efficacy, acceptability and side effects of subdermal contraceptions in 1000 women. The pregnancy rate in the first year was only 0.1 percent and continuation rates were 90 and 75 percent in the first second and third years,respectively. This method was admitted to the National Family Planning Programme in 1983.[6,7] Many studies were conducted which demonstrated no adverse effects in Thai womens health. This method could be used in immediate post partum women[8] and was accepted in groups of people who rejected any other contraceptive methods such as hill-tribes people.[9]

Subdermal contraception insertion is a minor operation which can easily be performed by trained physicians. Good insertion techniques decrease the complications and problems in removal after 5 years use. Physicians are likely to insert the implants too deep in their first 3-4 operations due to fear that the trocar will pierce the skin.[1] Too deep insertions will result in difficult removals and possible migration of the implants from the original site. Therefore subdermal contraception insertion training is most important.

In Thailand, the newly graduated doctors are required to work in the government hospitals or health centers for a certained time. The contraceptive insertion training is required before graduating

Interviews of 36 sixth-year medical students revealed that 89 per cent were satisfied with the theoretical part, but only 25 per cent has performed the insertion in real acceptors. The reasons were that there were few acceptors and the first 2 acceptors were always needed to demonstrate the insertion technique by the staffs and residents. Fifteen per cent of the students lacked confidence and were not satisfied with the subdermal contraception training programme provided by the department.

Conventional clinical skill training is comprised of classroom lectures and clinical practice. This way of learning can create unnecessary risks to the patients due to unskilled techniques. Humanistic training is a way of improving skill and the quality of the training. It comprises competency-based learning, step guidelines, evaluation forms and using models before practice in real clients. This training method can help to decrease risks to acceptors, improve first time insertion qualities and reduce the numbers of acceptors needed for training. Chicken is cheap, easy to acquire and can be used as training subject. Our subdermal contraceptions

training programme using chickens as the training model was conducted to compare the effectiveness, numbers of acceptors needed, operative time, complications and satisfaction of the medical students and the acceptors with the conventional programme

Materials and Methods

During April 1993 to October 1994, following pre-tests evaluation, 60 sixth-year medical students were randomly assigned to two groups; group 1 and group 2. Group 1 was assigned into conventional programme group which comprised of lectures in the general principles in family planning, demonstration of the first 3 rods insertion in acceptors by residents and a practice 3 rods insertion in acceptors. Group 2 was assigned to the chicken model subdermal contraceptions training programme which comprised of lectures in the general principles of family planning, slide review of basis knowledge of subdermal contraceptions, video tape review of insertion steps, chicken model insertion training practice, evalu-ation in the chicken model, a demonstration of the first 3 rods insertion in acceptors by residents and a practice 3 rods insertion in acceptors. First year residents evaluated them by check list evaluation forms on which every critical step had to be done correctly. The operative time and complications were recorded. Post-tests and questionaires were given before leaving the department. The satisfaction of the medical students and the acceptors was evaluated.

The population size was calculated by using proportion of students passing the first evaluation. Comparisons between both groups were evaluated using the unpaired student t-test, paired student t-test and t-test proportion. Reliability of the test was analysed by exam analysis computer programme of Medical Education Unit, Faculty of Medicine, Chulalongkorn University.[14]

Results

The characteristics of the sixth year medical students were of age, weight, height and GPAX and there was no statistically difference. (table 1). There were significant differences of the proportions of sixth year medical students passing the evaluations in Gr.1 and Gr.2 among the 2nd acceptors (67% vs 90%) and 3rd acceptors (87% vs 100%). No significant

Table 1. Characteristics of sixth - year medical students.

	Age (years) (mean + S.D.)	Weight (Kgs.) (mean + S.D.)	Height (cms.) (mean + S.D.)	GPAX (mean + S.D.)
Gr. 1	22.6 ± 0.5	54.6 ± 10.51	65.0 ± 5.4	3.1 ± 0.3
Gr. 2	22.0 ± 0.8	60.6 ± 8.01	66.3 ± 6.1	3.2 ± 0.4
Statistical significance	NS	NS	NS	NS

Table 2. Proportions of sixth-year medical students passing the evaluations in the 2nd, 3rd, 4th acceptors.

	Proportions in the 2nd acceptors. (%)	Proportions in the 3rd acceptors. (%)	Proportions in the 4th acceptors. (%)
Gr. 1	67	87	100
Gr. 2	90	100	100
Statistical significance	$p < 0.05$	$p < 0.05$	NS

Table 3. Mean scores of pre and post test and mean of difference of pre and post test scores compared between both groups.

	Pre test score (mean + S.D.)	Post test score (mean + S.D.)	Mean of difference (mean $\pm$ S.D.)
Gr. 1	63.0 $\pm$ 12.5	73.3 $\pm$ 12.5	10.7 $\pm$ 12.5
Gr. 2	61.7 $\pm$ 12.9	87.3 $\pm$ 8.2	25.5 $\pm$ 13.9
Statistical significance	NS	$p < 0.01$	$p < 0.01$

Table 4. Mean scores of pre and post test compared in the same group.

	Pre test score (mean $\pm$ S.D.)	Post test score (mean $\pm$ S.D.)
Gr. 1	63.0 $\pm$ 12.5	73.3 $\pm$ 12.5
Gr. 2	61.7 $\pm$ 12.9	87.3 $\pm$ 8.2
Statistical significance	$P < 0.01$	$p < 0.01$

Table 5. Mean operative time (min).

	Mean operative time in 2nd acceptors (mean ± S.D.)	Mean operative time in third acceptors (mean ± S.D.)
Gr. 1	13.6 ± 4.1	6.6 ± 3.6
Gr. 2	8.3 ± 2.6	5.5 ± 2.3
Statistical significance	$p < 0.01$	NS

Table 6. Mean of satisfaction scores of sixth year medical students.

	Mean of satisfaction scores (mean ± S.D.)
Gr. 1	3.2 ± 0.8
Gr. 2	3.4 ± 0.5
Statistical significance	NS

Table 7. Mean of satisfaction scores of acceptors.

	Mean of satisfaction scores (mean ± S.D.)
Gr. 1	2.7 ± 0.8
Gr. 2	3.4 ± 0.6
Statistical significance	$p < 0.01$

Table 8. One-week follow up.

	Gr.1 Numbers (%)	Gr.2 Numbers (%)
Incision wound		
- good healing	99(100)	101(100)
- infection	0 (0)	0 (0)
The numbers of rods that can be palpated		
- 6 rods	98(99)	101(100)
- less than 6 rods	1(1)	0(0)

difference was found among the 4th acceptors (100% vs 100%) (table 2). When comparing the pre and post-test scores between both groups (table 3), there was no statistically significant difference in the pre-test scores (63.0 ± 12.5 vs 61.7 ± 12.9) but there was a statistically significant difference in the post-test scores (73.3 ± 12.5 vs 87.3 ± 8.2). The mean of difference of pre and post-test scores (table 3) was 10.5 ± 12.5 in Gr.1 and 25.5 ± 13.9 in Gr.2 with statistical significance ($p < 0.01$). When comparing the pre and post-test scores in the same group (table 4), there was a statis-tically significant difference in the pre and post-test scores of both groups (63.0 ± 12.5 vs 73.3 ± 12.5 in Gr.1) and (61.7 ± 12.5 vs 87.3 ± 8.2 in Gr.2)($p < 0.01$). The mean operative time in second acceptors (table 5) was 13.6 ± 4.1 min Gr.1 vs 8.3 ± 2.6 min in and Gr.2 ($p < 0.01$) with statistical significance ($p < 0.01$) but not among the third round of acceptors (6.6 ± 3.6 vs 5.5 ± 2.3 min). The mean of the satisfaction scores of the sixth-year medical students to the training programme (table 6) was 3.2 ± 0.8 in Gr.1 and 3.4 ± 0.5 in Gr.2 with no statistical significance. The mean of the satisfaction scores of the acceptors to the subdermal contraception insertions (table 7) was 2.7 ± 0.8 and 3.4 ± 0.6 in Gr.1 and Gr.2 with statistical significance ($p < 0.01$). At one-week follow-up (table 8). There was 40 cases (16.7%) lost (21 cases in Gr.1 and 19 cases in Gr.2). The incision healing was good in all remanining cases. Six rods could be palpated in 98 cases (99%) of Gr.1 and 101 cases (100%) of Gr.2, and there was only 1 case (in Gr.1) in which only 5 rods could be palpated. The content validity was checked by the experts from the Family Health Division, Department of Health and Family Planning Unit, Chulalongkorn Hospital. The reliability of the tests was 0.65 (using exam ination analysis computer por-gramme of the Medical Education Unit of Chulalongkorn University).[14]

Discussion

From this study, the chicken model training programme was determined to be more effective than the conventional programme. More students passed the evaluations for the second, third and fourth acceptors in the chicken model training programme than in the conventional programme. The number of acceptors needed for training in order to pass the evaluations was only 3 per student in the chicken model training group. Both groups had better scores in the post-test but the students in chicken model training group had more progression (higher post-test scores and differences compared to the pretest). The acceptors also appreciated the services from the chicken model training group because of the increased pre and post-insertion counseling. Significantly, all of the students who did not pass the evaluations did not have any pre-insertion counseling.

Training in models before performing the operations in humans should be done so as to decrease the risks of the operation to the patients. It helps increase the skill, decrease the operative time and increase the confidence of the trainee. Eventhough the sixth-year medical students had been trained in the Department of Surgery before, the students in the chicken model programme

group were more skillful than the conventional programme group. Models training is a better way of clinical skill training.

The rubber arm model is expensive (875 baht per model) and does not stand up well in warm climates. The chicken model is cheap, readily available, and can be prepared for food after the training. This model can help decrease the cost of this type of training.

Conclusion

The chicken model training programme was more effective than the conventional programme. It helped the sixth-year medical students to improve their skill, and knowledge and to give more satisfaction to the acceptors. The chicken model was cheap and easily prepared. The use of this programme is thus encouraged.

Acknowledgement

The authors wish to thank Suwanna Vorakamin M.D., Sanith Kaewthong; Family Health Division, Department of Health, for the video tapes and subdermal implant manuals used in this study.

References

1. Addevoh K, Affandi B, Bore IIU, Diczfalusy E, Von Elckstedt KE, Elder M. Facts about an implantable contraceptive : memorandum from a WHO meeting. Bull World Health Organization 1985;63: 485-94
2. Alvarez F, Brache V, Faundes A, Johansson ED, Odlind V, Nash H. Levonorgestrel plasma levels during continuous administration with different models of subdermal implants. Contraception 1983; 27:123-38
3. Leiras Pharmaceuticals. Norplant(R) contraceptive implants. Leiras. Finland, n.d.
4. Bardin CW, Sivin I. Norplant contraceptive implants a new contraceptive for women. IPPF Med Bull 1985;19:1-4
5. Reinprayoon D, Vongsrisachanarai J, Virutamasen P. Biodegradable subdermal implants. Bio Med J Chula 1973;2: 139-45
6. Koetsawang S, Varakamin S, Satayapan S, Dusitsin N. Norplant Clinical study in Thailand. In : Zatuchni, Gerald I., eds. Long-Acting Contraceptive Delivery Systems. Hagerstown: Harper & Row, 1984:459-70
7. Satayapan S, Kanchanasinith K. Varakamin S. Perceptions and acceptability of NORPLANT implants in Thailand. Stud Fam Plann 1983 Jun-Jul;14(6-7):170-4
8. Prueksananon K, Ngampupan S, Reinprayoon D, Virutamasen P, Bunkasemsanti V. Post-partum subdermal contraceptions : preliminary report. In : Thailand Fertility Research Association. Memorandum from 6th Fertility Research Investigations Meeting. Pattaya September 5-6, 1987; Pattaya : Thailand Fertility Research Association, 1987:128-40
9. Aumkul N. The study of subdermal contraceptions in hill tribes users. In : Thailand Fertility Research Association. Memorandum from 8th Fertility Research In-

vestigations Meeting. Pattaya September 16-17, 1989: Pattaya : Thailand Fertility Research Association, 1989:131-57

10. Bunyavejchevin S. Attitudes and satisfactions of sixth-year medical students to subdermal contraception training. Faculty of Medicine. Chulalongkorn University, 1992. (Unpublished data)
11. Approach to training. Baltimore: John Hopkins Programmes for International Education in Gynecology and Obstetrics, Bultimore: John Hopkins Hospital, 1993
12. Limpaphayom K, Reinprayoon D, Lumpikanon P, Niyomvan V, Ajillo Clayton. Intrauterine device Tcu 380A training programme. In : Department of Health, Ministry of Public Health. Memorandum from Intrauterine Device Training Programme Evaluation in Midwifery during 1989-1991. Cha-am April 23-24, 1993; Cha-am: Family Health Division, Ministry of Public Health. 1993: 10-58
13. ChomputaweepS, Sentakul P. A study for Norplant insertion training using a chicken model and a rubber arm model. Chula Med J 1987 Sep; 31(9):743-7
14. Congtrakul P, Jaroongdaechakul M. Microcomputer programme for item analysis. Chula Med J 1986 Feb;32(2):199-206