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Development of Web-based Reproductive Health Program

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Abstract

This study was done to develop an education program for reproductive health management of unmarried women over 35. In order to investigate the education demand of the subjects, documentation research and learner analysis were conducted to develop an education program, and Delphi investigation was conducted against 7 experts. Through the web-based reproductive health management program for unmarried women over age 35 developed in this study, the knowledge on reproductive health can be enhanced and a positive attitude can be cultivated, so as to increase health activity practice rate.

Keywords*: Women, Reproductive Health, Education, Web, Health Promotion*

1. Introduction

According to the 2013 Women and Family Panel Survey, unmarried women of 19-64 years of age is 10.5%[1], and unmarried women of 35-44 years of age among Koreans women is 15.2%[2]. The increasing trend of the percentages of unmarried women and women who marry late affects birth rates. Since 2002, the total birth rate has been less than 1.3, which is the lowest birth rate of those of the OECD countries. This state of affairs continued for twelve, making this rate the longest-lasting low birth rate [3]. The marriage and birth survey of 2012 found that 29.5% of unmarried women of 35-44 years of age have recognised the necessity of marriage unmarried therefore late marriage rate of women is reported to be increasing [4].

For women, the most important age for reproductive health is around 35 years, as the ovaries begin to degenerate after this age, along with other physiological changes. No experience of pregnancy or childbirth or being unmarried are known to be risk factors for female genital diseases [5]. Uterine myoma is a gynaecological disease that occurs mainly in women of 30-45 years of age, and also occurs in approximately 40-50% of women of childbearing age in Korea. For women of more than 35 years of age of no experience unmarried women childbirth ‘state of the uterus overwork’ is rapidly rising incidence of uterine myoma.

Previous studies regarding the reproductive health of unmarried women have examined the participation rate of cervical cancer check-ups on 1,625 women of 25-59 years of age in Poland [6], and revealed that the non-participation rate of married and divorced women was 5%, whereas that of unmarried women and widows was

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25%. In addition, one previous study, comparing health management before childbirth according to the marital status of 4,037 women, revealed that married women were using pre-childbirth health care 2.36 times better than do unmarried women [7]. By age group, women under 30 and women of 30-39 years of age had pre-childbirth health care usage rates of 4.09 and 1.98 times higher, respectively, than do women older than 40 years. Another study examining the use of medical institutions and reproductive health issues by unmarried women in their twenties revealed that 156, or 49.2%, of the 317 research subjects had genital health problems, and only 38.5% of them used medical institutions. This result shows that women were not receiving adequate medical treatment despite having symptoms [8]. The results of the requirements of education on the reproductive health of unmarried women over 35 years of age were related to preparation for pregnancy, pregnancy, childbirth, infertility, birth control, female genital disease, female cancer and menopause [9]. So, the factors of vulnerability and disturbances of older unmarried women in reproductive health management will be examined and an education program that can effectively provide appropriate information will be prepared.

Preceding research has confirmed that knowledge of and attitudes towards reproductive health can affect health behaviour. One study developed and applied a reproductive health program for female marriage immigrants and the results proved to have a significant effect on improving knowledge, attitudes and behaviours regarding reproductive health [10]. Another study developed a reproductive health improvement program targeting university students and confirmed an increase in knowledge about sex and the formation of positive attitudes towards sex [11]. Therefore, an education program that considers the approachability and efficiency which will lead to adequate reproductive health management behaviour by providing knowledge on high-risk pregnancy management, along with a health care plan for lowering the risk of female cancer resulting from the increase in age, by means of disease prevention and early discovery targeting old aged, unmarried women, must be established, and an inquiry involving document research and the education needs of subjects must be preceded.

2. Research Purpose

The study aims at developing a web-based genital health management program that is capable of contributing to the prevention of genital diseases and the improvement of health by promoting the implementation of health behaviors and improving the genital health management knowledge of old aged, unmarried women. The detailed goals are as follows.

1) The study examines documents on genital health management for old aged, unmarried women.
2) The study inquires into the educational needs regarding genital health management from old aged, unmarried women.
3) The study conducts an expert Delphi analysis on the contents from the inquiry into educational needs and the document research regarding the genital health management of old aged, unmarried women.

2. Method

2.1. Research Design

This study is a methodological study to develop the educational contents for web-based reproductive health program for unmarried old age women.

2.2. Samples

The subjects of this study were unmarried women between the age of 35 and 50, and 180 women who understood the research aim and voluntarily agreed to participate were finalized as subjects. And they worked at hospitals, department stores, call centers, insurance companies, banks, schools, and welfare centers of B city.

2.3. Development of Educational contents

Documentation Review. For documentation research were used to find 23 journal articles and 6 degree theses. For domestically Koreamed, Korea Education Research Information Service (RISS), Society of Korea Institute of Science and Technology Information (KISTI), Koreanstudies Information Services System (KISS), and Nuri Media (DBpia) electronic databases. For foreign sources, PubMed, CINHAL, and ScienceDirect electronic databases were used to search with keywords of unmarried women, single women, health, middle aged (Table 1).

Table 1. Articles Search Results

	Theme	**source**
Korean paper	The Study on Unmarried Women Over the Age of 30, Regarding the Value of Marriage and Children and the Knowledge of High Risk Pregnancy (2014).	The korean Society of Maternal and child health
	(A)predictive model for health risk behaviors of unmarried women in Korea(2001)	Yonsei University Doctoral dissertation
	(The) Lifestyle and Health Status of Korea Women(2000)	Ewha womans University Master's thesis
	Women's perception of premarital health examination(2007)	Pusan National University Master's thesis
	(The) Relationship between Health Behaviors and Subject Health Status of Unmarried Female Workers(2002)	Chungnam National University Master's thesis
	A Predictive Model on the Smoking Behavior of the Fertile Unmarried Women(2003)	Chung-Ang University Doctoral dissertation
	The Study of Drinking, Smoking, and Depression among Single Females (2001)	Research Institute of Nursing Science, Ewha Womans University
	Development and evaluation of the mobile web-based pregnancy health care educational program for old pregnant women aged 35 years(2014)	Ewha womans University Doctoral dissertation
	A Study Unmarried Women's Health-Promoting Behavior(1996)	collected papers
	Factors Influencing the Health Examination in Unmarried Women(2014)	Korean Journal of Womens Health Nursing
	A Study on the Level of Awareness and Self-Efficacy of osteoporosis in Young Women(2010)	Korean Journal of Womens Health Nursing
	Influencing Factors of Intention of Undergoing Pap Testing among Unmarried Nurses (2014)	Korean Journal of Womens Health Nursing
	A Study on Recognition, Intention and Compliance to Premarital Examination of Women(2010)	Korea Academia-Industrial cooperation Society
	Reflection of female perspectives on an emergency contraceptive pill(2006)	Korean Journal of Womens Health Nursing
	How do you treat unmarried women or infertile if you have uterine myoma or adenomyosis?(2005)	Health news magazine
National foreign paper	Background factors influencing somatic and psychological symptoms in middle-age women with different hormonal status. A population-based study	Maturitas

of Swedish women(2005).	
Psychosocial factors and attendance at a population-based mammography screening program in a cohort of Swedish women (2014).	BMC Women's Health
The lived experience of pregnancy complications in single older women (2010).	American Journal of Maternal Child Nursing
Factors related to inadequate cervical cancer screening in two Brazilian state capitals (2009).	Rev Saúde Pública
Patient-provider communication and cancer screening among unmarried women (2008).	Patient Educ Couns.
Do single and partnered women with gynecologic cancer differ in types and intensities of illness-and treatment-related psychosocial concerns? A pilot study (2007).	Janet M. de Groot, Kenneth Math, Anthony Fyles, Susan Winton, Sarah Greenwood,, Denny DePetrillo, Gerald M. Deving
Study on the related factors of prenatal health care among floating women in five cities of China (2014).	Zhu l, Liu H, Pei L
Impact of Maternal Marital Status on Birth Outcomes Among Young Malaysian Women: A Prospective cohort Study (2014).	Norhas Mohd Zain, Wah Yun Low, Sajaratulnisah Othman
A review of contraceptive practices among married and unmarried women in China from 1982 to 2010 (2013).	Jinke Li, MarleenTemmerman, Qiuju Chen, Jialin Xu, Lina Hu, Wei-Hong Zhang
The influence of marital status on the stage at diagnosis, treatment, and survival of older women with breast cancer (2005).	Cynthia Osborne, Glenn V. Ostir, Xianglin Du, M. Kristen Peek, James
Comprehensive Cancer Screening among Unmarried women aged 40-75 Years: results from the cancer screening project for women(2009).	Melissa A.Clark, Michelle L. Rogers, Gene F. Armstrong, William Rakowski, Deborah J. Bowen, Tonda Hughes, Kelly A., McGarry
Pregnancy intention in an urban Australian antenatal population (2013).	RassiA, Wattimena J, Black K.
Conditions and Consequences of a BRCA Mutation in Young, single women of childbearing Age (2010).	Rebekah Hamilton, Karen E. Hurley

Website Search. Questions on genital health were searched from internet websites. The search was conducted by excluding posts that included overlapping content or aimed at promoting products, insurance or medical institutes, posts that were written in languages other than Korean or English, and posts that were related to legal issues. The searched involved the three major domestic search engines (as of April 28, 2014) Naver (www.naver.com), Daum (www.daum.net), and Google (www.google.co.kr), and the keywords that were searched were unmarried women, old aged unmarried women, unmarried women over 35, health, and genital health (Table 2).

Table 2. Maternity hospital and Women's Hospital Home Search results

Searches	A Hospital	B Hospital	C Hospital	D Hospital	E Hospital
Older age	12	0	5	7	9
Unmarried	59	23	15	171	125
35 years old	16	6	5	15	19
High Risk	20	6	1	39	35
Menopause	22	7	1	18	29

2.4. Content Validity of Educational Program

To verify the validity of the education content of the genital health management program for old aged, unmarried women, the study composed a panel of experts and used the Delphi method. The selection of the expert panel and the procedures to verify content validity are as follows.

Expert Panel. The study selected an expert panel to secure representability by using a purposive sampling method to inquire into the content validity of the genital health management program. Because the number of experts participating in the validity inquiry must be at least three and not exceed 10 [12], the study selected a total of seven experts including two gynecologists, two professors specializing in female health nursing, and two nurses with over five years experience working in ob/gyn hospitals, and one expert in childbirth policy from the Korea Institute for Health and Social Affairs, by obtaining prior consent and confirming intent to participate in the study, by considering field experience, academics, and institutions, out of those satisfying the selection standards.

Education Program (Proposal) Content Validity. Verification In order to verify the content validity of reproductive health management program (proposal), a panel of experts was constituted and Delphi investigation was conducted. Among those who meet the selection criteria, considering the practices, academia, and organizations, the intent of participation to this study was checked and prior consent was obtained to select 2 gynecology specialists, 2 female health nursing professors, 2 nurses with over 5 years of experience at gynecology clinics, 1 expert adviser for childbirth policies at Korea Institute for Health and Social Affairs, for a total of 7 subjects. In order to investigate the validity of education themes and education contents per theme (proposal), the 1st expert panel Delphi investigation was executed from May 19th to May 30th of 2015. In this study, the number of expert panel was 7, so in the 3-step content validity investigation, the ratio of experts responded with 3 or 4 for each item was calculated to draw content validity index (CVI). The themes and contents with CVI of 0.86 or lower from the 1st Delphi investigation were modified/complemented for the 2nd Delphi investigation, and the items with CVI of 0.86 or lower from the 2nd investigation were again modified and complemented, and finally the items with CVI of 0.86 or higher from the 3rd Delphi investigation were adopted.

2.4. Ethical Consideration

This study was approved by the university Institutional Review Board. Informed consent was obtained prior to administration of the measure. The investigator introduced the purpose of the study, described procedures, and explained the confidentiality of records to each participant. Those who were willing to participate in the study were asked to sign a consent form and to complete a self-reported questionnaire.

2.5. Data Analysis

When seven experts participated in the content validity inquiry of the survey and five or more members agreed on content validity, the item was deemed ‘good’, and if six or more experts agreed, then the item was deemed ‘excellent’ [13]. Because the number in the expert panel in this study was seven, the study calculated a content validity index (CVI) by calculating the ratio of experts responding with scores of three or four points to each question of the inquiry over three stages. All topics and contents in the primary Delphi inquiry, with a CVI below 0.86 and which were corrected by the experts, were modified and supplemented to undergo the secondary Delphi inquiry. Items with a CVI below 0.86 in the secondary Delphi inquiry were again investigated in the tertiary Delphi inquiry and those items above a CVI of 0.86 were selected.

3. Results

3.1. Learner Analysis

Unmarried women between the age of 35 and 50 in the city B Who work in education, health, finance, and service industry were sampled, and against the 180 subjects who voluntarily agreed to participate in the research, online/offline surveys were conducted from February 4th to April 7th of 2015 (Table 3).

Table 3. Learners Analysis

	Classification		35~40 years old n(%)	41~45 years old n(%)	46~50 years old n(%)	Total M ± SD
Age			134(74.4)	31(17.2)	15(8.3)	38.71±3.8
Education	high school graduation		11(6.1)	2(1.1)	2(1.1)	15(8.3)
	College graduation		93(51.7)	20(11.1)	6(3.3)	119(66.1)
	Graduate later		30(16.7)	9(5.0)	7(3.9)	46(25.6)
Job	Professions		59(32.8)	19(10.6)	7(3.9)	85(47.2)
	Office		36(20.0)	5(2.8)	2(1.1)	43(23.9)
	Service industry		14(7.8)	4(2.2)	3(1.7)	21(11.7)
	Sales position		11(6.1)	2(1.1)	2(1.1)	15(8.3)
	Labor job		2(1.1)	0(0)	0(0)	2(1.1)
	Etc		12(6.7)	1(0.6)	1(0.6)	14(7.8)
The average monthly income	Less than 1 million won		6(3.3)	0(0)	1(0.6)	7(3.9)
	1 million won ~ 1.99 million won		41(22.8)	13(7.2)	4(2.2)	58(32.2)
	Two million won~299 million won		64(35.6)	9(5.0)	2(1.1)	75(41.7)
	More than 3 million won		23(12.8)	9(5.0)	8(4.4)	40(22.2)
Residential types	One-person families		33(18.3)	13(7.2)	4(2.2)	50(27.8)
	Live with colleagues or family		101(56.1)	18(10)	11(6.1)	130(72.2)
Computer Training Course	That is		108(60.0)	22(12.2)	11(6.1)	141(78.3)
	None		26(14.4)	9(5.0)	4(2.2)	39(21.7)
Experiences Course	word processor	That is	79(43.9)	17(9.4)	5(2.8)	101(56.1)
		None	55(30.6)	14(7.8)	10(5.6)	79(43.9)
	Excel	That is	79(43.9)	15(8.3)	7(3.9)	101(56.1)
		None	55(30.6)	16(8.9)	8(4.4)	79(43.9)
	Power point	That is	53(29.4)	14(7.8)	4(2.2)	71(39.4)
		None	81(45.0)	17(9.4)	11(6.1)	109(60.6)
	Internet	That is	13(7.2)	6(3.3)	5(2.8)	24(13.3)
		None	121(67.2)	25(13.9)	10(5.6)	156(86.7)
	Web Design	That is	14(7.8)	1(0.6)	4(2.2)	19(10.6)
		None	120(66.7)	30(16.7)	11(6.1)	161(89.4)
	Programming Language	That is	4(2.2)	3(1.7)	2(1.1)	9(5.0)
		None	130(72.2)	28(15.6)	13(7.2)	171(95)

Using the Internet	used		134(74.4)	31(17.2)	15(8.3)	180(100)
	not used		0(0)	0(0)	0(0)	0(0)
Internet use location	Home		40(22.2)	9(5.0)	6(3.3)	55(30.6)
	Workplace		94(52.2)	22(12.2)	9(5.0)	125(69.4)
Internet usage first inning			2.31±1.96	3.09±3.13	2.57±1.91	2.46±2.21
The number of weekly Internet use			7.51±10.07	5.55±2.72	8.33±7.79	7.24±9.05
Internet usage	Email confirmation	used	51(28.3)	16(8.9)	6(3.3)	73(40.6)
		not used	83(46.1)	15(8.3)	9(5.0)	107(59.4)
	Business Purpose	used	81(45.0)	22(12.2)	11(6.1)	114(63.3)
		not used	53(29.4)	9(5.0)	4(2.2)	66(36.7)
	Magazines Search	used	55(30.6)	15(8.3)	7(3.9)	77(42.8)
		not used	79(43.9)	16(8.9)	8(4.4)	103(57.2)
	Online shopping	used	61(33.9)	11(6.1)	6(3.3)	78(43.3)
		not used	73(40.6)	20(11.1)	9(5.0)	102(56.7)
	Community Activities	used	24(13.3)	3(1.7)	4(2.2)	31(17.2)
		not used	110(61.1)	28(15.6)	11(6.1)	149(82.8)
	Game	used	10(5.6)	2(1.1)	1(0.6)	13(7.2)
		not used	124(68.9)	29(16.1)	14(7.8)	167(92.8)
Internet literacy	Very good use		11(6.1)	0(0)	0(0)	11(6.1)
	The good use		67(37.2)	21(11.7)	8(4.4)	96(53.3)
	Average utilization		46(25.6)	9(5.0)	5(2.8)	60(33.3)
	Do not make good use		8(4.4)	1(0.6)	2(1.1)	11(6.1)
	Do not use at all		2(1.1)	0(0)	0(0)	2(1.1)
Internet lecture course experience	That is		93(51.7)	22(12.2)	10(5.6)	125(69.4)
	None		41(22.8)	9(5.0)	5(2.8)	55(30.6)
Educational need	It is very necessary		37(20.6)	8(4.4)	3(1.7)	48(26.7)
	It is necessary		78(43.3)	20(11.1)	9(5.0)	107(59.4)
	Commonly need		18(10.0)	3(1.7)	3(1.7)	24(13.3)
	Not necessary.		1(0.6)	0(0)	0(0)	1(0.6)
Willing to take education	Very much.		17(9.4)	5(2.8)	2(1.1)	24(13.3)
	much		44(24.4)	11(6.1)	5(2.8)	60(33.3)
	common		61(33.9)	12(6.7)	7(3.9)	80(44.4)
	none		12(6.7)	3(1.7)	1(0.6)	16(8.9)

3.2. Education Theme of Learner Analysis

The study made inquiries by creating questions on general characteristics, educational form, education level, attitude toward the genital health management program, level of usage motive, computer use, and internet utilization ability, in the survey, during field inquiry aimed at needs analysis in order to comprehend learner attitude, motive, and internet utilization ability toward web-based education. Through documentation review, learner analysis, and three times of content validity tests verification process by the expert panel, the high-age unmarried women reproductive health management program education contents (proposal) was developed with total of 9 theme areas. The 9 theme areas are national support project, pregnancy preparation, pregnancy, childbirth, infertility, birth control,

female genital disease, female cancer, and menopause. And the details were classified into 27 large categories, 65 medium categories and the following sub-items (Table 4).

Table 4. Education Themes and Per-Theme Categorizations

Domain	Category	Sub- category
1. National support project	Overview	Overview
	Project types	Pre-pregnancy support project
		During-pregnancy support project
2. Pregnancy preparation	Overview	Overview
	Tests and vaccination for healthy pregnancy	Test
		Vaccination
	Health management for infertility prevention	Weight management
		No smoking / no drinking
		Diet
		Nutritional supplements
		Exercise
		Life habits
3. Pregnancy	Overview	High-age pregnancy and high-risk pregnancy
		Pregnancy stages
		Precautions for high-age pregnancy
	Pre-pregnancy management of high-age mother	Definition
		Count of regular inspections per pregnancy week
		Regular inspection during early pregnancy
		Regular inspection during mid-pregnancy
		Regular inspection during late pregnancy
		Diseases found in regular inspections
4. Childbirth	Overview	Childbirth indicators
		Childbirth process
		Issues during contractions
		Issues after childbirth
	Types of delivery	Natural childbirth
		Caesarean childbirth
		Other methods
	Postpartum care of high-age mother	Postpartum care
		Breast care while breastfeeding
		Nutrition care
		Kegel exercise
		Daily life
		Regular checkup
5. Infertility	Overview	Definition
	Cause	High-age and infertility
		Infertility-related diseases
	Infertility test	Types
	Treatment	Root disease treatment
	Miraemom Fertility Preservation	
6. Birth control	Overview	
	Types	Hormone drug
		Intrauterine device
7. Female genital disease	Overview	
	Types	Menstruation disturbance
		Inflammatory disease
		Uterine diseases and tumors
		Ovary diseases and tumors
	Inspection to prevent/diagnose	Pelvic examination

	female genital diseases	Pelvis ultrasound Cervical cancer test Cancer indicator test
8. Female cancer	Overview	
	Types	Cervical cancer Endometrium cancer Ovarian cancer Breast cancer
9. Menopause	Overview	
	Symptom	Menopausal transition period Menopausal period
	Diagnosis	Menopausal transition period Menopause
	Treatment	Hormone therapy
	Care	Dietary life Exercise

4. Discussion

This study was conducted for the purpose of developing web-based reproductive health programs that could contribute to the prevention of reproductive diseases and to the promotion of the health of unmarried women at an advanced reproductive age by improving their knowledge of reproductive health care and encouraging the implementation of healthy behaviours. In addition, literature reviews, educational needs of the subjects, *etc*. may also be the basis for achieving this purpose. In order to determine the attitudes, motivation, level of internet literacy, *etc*. of the learners for web-based education, the field investigation questionnaire for needs analysis, which consists of items about the general characteristics, forms of education, levels of education, the attitude of reproductive health care programs, usage motivation levels, availability of computer usage, internet literacy, *etc*., were configured for investigation. The results of this study regarding the level of education of the subjects were: 91.7% in total had an undergraduate level at least with 66.1% of them being undergraduates and 25.6% of them being graduates. The job types consisted of 47.2% professional jobs and 23.9% clerical jobs, whereas 63.9% out of total subjects had monthly incomes of over two million. Looking at the socio-demographic characteristics of unmarried women at an advanced reproductive age of more than 35 years in this country confirmed that many of them had professional jobs and had economic power [14], reflecting the fact that unmarried women had relatively higher social positions than did other women [15].

This study developed nine subject areas, such as national support programs, preparation for pregnancy, pregnancy, childbirth, infertility, contraception, female reproductive diseases, female cancer and menopause, through a literature search, learner analysis and content validity verification process by a panel of experts. Based on these areas, reproductive health care training programs (draft) for the unmarried women at advanced reproductive ages were developed. As a result of three content validity tests, the details were classified into 27 large categories, 65 medium categories,and the following sub-items. Looking at the previous studies on the development of reproductive health programs, the contents of the training program were finally configured through meetings with experts of sexual medicine, sexual psychology, women's studies and nursing based on prior surveys [11], with the target college students with the contents of low sexual education and high degree of needs for sex as the main contents of program, and the program that consisted of practice, information sharing, role play *etc*. was configured. In the previous study [10], a four-week long reproductive health program consisting of education, counselling, emotional support and telephone monitoring was developed

based on health information, professional skills, decision-making control and emotional support on the basis of the Cox health behaviour correlation model and literature survey with the target marriage immigrant women. However, as the ovarian functions of women degrade at around the age of 35 years, this period is the most important one, in particular, for unmarried women who tend to be in a less healthy state and have less healthy behaviours due to a lack of spouses who might control their health behaviours [15]. Nevertheless, the reproductive health programs targeting the unmarried women at advanced reproductive ages have not yet been developed. Therefore, it is believed that the need for program development should be further emphasized.

In determining the educational methods, it was confirmed that 78.3% had taken computer training courses, 56.1% knew how to use word processing and electronic spreadsheet computer applications, and all of 180 subjects were using the internet regularly. As for the need for internet education, 26.7% and 59.4% had the opinions of "very necessary" and "necessary", respectively, showing that 86.1% of the total felt the need for internet education. It is believed that an approach using web-based programs would be an efficient way in situations where it is necessary to prepare educational programs in consideration of accessibility and effectiveness.

It is deemed that the development of web-based programs with the aim of disease prevention and early detection in the target of unmarried women at advanced reproductive age will henceforth play an important role leading to appropriate reproductive health care behaviours by providing information on high-risk management in accordance with pregnancy at advanced reproductive ages along with the health care roles to reduce the risk of female cancer following an increase in age.

5. Conclusion

Through the web-based reproductive health management program for unmarried women over the age of 35 years developed in this study, the knowledge on reproductive health can be enhanced and a positive attitude can be cultivated, so as to increase the rate of practice of health activities. This result indicates that the program is expected to be a useful and effective one in reproductive health management.

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