


Open Access Article

 <https://doi.org/10.55463/issn.1674-2974.50.3.4>

Development of a Preconception Counseling Model through the “Ayuk Sehat” Application for Brides-To-Be as an Effort Preparing a Healthy Birth

Fanny Ayudia¹, Yusrawati², Mudjiran³, Firdawati¹, Nur Indrawati Lipoeto⁴, Ahmad Syafruddin Indrapriyatna⁵

¹ Faculty of Public Health, University of Andalas, Padang, West Sumatera, Indonesia

² Department of Midwifery, Faculty of Medicine, University of Andalas, Padang, West Sumatera, Indonesia

³ Department of Education, Faculty of Education, University of Padang State, Padang, West Sumatera, Indonesia

⁴ Doctoral Biomedical Sciences, Faculty of Medicine, University of Andalas, Padang, West Sumatera, Indonesia

⁵ Department of Industrial Engineering, University of Andalas, Padang, West Sumatera, Indonesia

Received: January 5, 2023 ▪ Review: February 1, 2023 ▪ Accepted: March 7, 2023 ▪ Published: March 31, 2023

Abstract: Pregnancy planning prepares for pregnancy to support the creation of a healthy pregnancy. One way to increase knowledge related to preconception in this digitalization era is through an Android application that is applied to make it easier for couples to access and get information easily without having to visit health facilities, to be able to understand and strive for the best way to be thought of the bride-to-be couple so that maximum results are obtained precisely to plan a healthy birth baby. The study accesses the effectiveness of the AYUK SEHAT mobile phone applications in promoting knowledge and changing the perceptions and attitudes of brides and grooms. Descriptive statistical analysis in this study was carried out using the average value (mean) on each variable indicator or statement indicator in the questionnaire with a case experience test. The study population was 40 brides-to-be couples with details of 10 prospective wives and 10 prospective husbands, purposive sampling techniques. Almost all indicators in the attractiveness variable get a positive evaluation value, except for the ATT5 indicator (attractive/unattractive) get a neutral evaluation value. All indicators on the dependability variable managed to obtain a positive evaluation value except for DEP4 (meeting expectations / not meeting expectations) with a neutral evaluation. Almost all indicators in the novelty variable get positive evaluation values, except for NOV 1 (creative/monotonous) and NOV2 (creative/conventional indicators get neutral evaluation values. According to Android app users, the variables attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty get a positive evaluation value.

Keywords: counseling, preconception, Android applications, bride-to-be.

通过“加油健康”应用程序为准新娘开发孕前咨询模型，为健康分娩做准备

摘要：怀孕计划为怀孕做准备，以支持生上健康的怀孕。在这个数字化时代增加与先入之见相关知识的一种方法是通过一个安卓应用程序，该应用程序使夫妻更容易访问和获取信息，而无需访问医疗机构，从而能够理解并争取最好的方法为准新娘夫妇着想，以便获得最大的结果，准确地计划一个健康的分娩婴儿。该研究评估了获得健康手机应用程序在促进知

识和改变新娘和新郎的观念和态度方面的有效性。本研究的描述性统计分析采用问卷中各变量指标或陈述指标的平均值(均值)进行个案经验检验。研究人群是 40 对准新娘夫妇,包括 10 名准妻子和 10 名准丈夫的详细信息,采用有目的的抽样技术。吸引力变量中的几乎所有指标都获得了积极的评价,除了贸易协定 5 指标(有吸引力/不吸引人)获得了中性评价。除数据保护计划 4(达到预期/未达到预期)获得中性评价外,所有关于可信度变量的指标都获得了积极的评价。除了非选项变量 1(创意/单调)和非选项变量 2(创意/常规指标)获得中性评价外,新颖性变量中的几乎所有指标均获得正评价。根据安卓应用用户的意见,变量吸引力,清晰度,效率,可靠性、刺激性和新奇性获得正评价。

关键词: 諮詢、先入之見、安卓應用程序、準新娘。

Introduction

The Health Programs in Indonesia currently only focus on the health programs for pregnant women. Health services before pregnancy as stated in the Ministry of Health, Republic of Indonesia with number 97 of 2014, have not been carried out properly [1]. This is accompanied by many health problems that occur in women before pregnancy, such as Chronic Energy Deficiency (CED), anemia, and HIV [2]. Likewise with newborn health conditions such as premature, LBW, and congenital defects [3].

In the first 1000 days of life (Gerakan 1000 HPK) is a phase of life that begins from the formation of the fetus in the womb (270 days) until it is 2 years old (730 days) [4]. This period is called the golden period, which if not put to good use, will cause permanent damage. The determination of the success of 1000 HPK does not begin when the mother is pregnant but begins during the preconception period [5].

Preconception care is part of preventive and promotive efforts that spearhead to eliminate the causes of maternal and child death, and risk factors affecting a person's pregnancy can be reduced by identifying these risk factors before the start of pregnancy [6]. Comprehensive preconception health service for brides-to-be is the right momentum to start the prevention of risky pregnancies [7]. Health preconceptions, especially nutritional status, become critical to reduce risks and promote a healthy lifestyle to prepare for a healthy pregnancy [8].

Pregnancy planning prepares for pregnancy to support the creation of a healthy pregnancy and produce quality offspring desired by the family. Preconception treatment is a treatment given before pregnancy with the aim of making it easier for a woman to achieve an optimal level of health before she conceives [9]. So far, many people do not understand the importance of conditions in the days before the conception process. This is understandable because of

the lack of knowledge about preconception conditions such as, knowledge of nutritional status, nutritional needs, and diet caused by the absence of counseling to them [10]. Knowledge awareness and beliefs about preconception care do not encourage women to make preconception health practices. Young preconception women and women who have had children are less involved in preconception health behaviors. It is therefore necessary to educate preconception women about the importance and benefits of preconception care [11].

Knowledge is an important aspect of the formation of a person's attitudes and behavior. Knowledge determines whether positive attitudes and behaviors can last on a person. Couples who obtain information about preconception health show better knowledge and health improvement efforts than couples who are not informed [12]. A person's knowledge and attitude can be formed through health counseling, the success of a health counseling, one of which is determined by the media used. Good counseling media is formed according to the level of target acceptance to make information more easily received [13].

Husbands have a role in the pregnancy process in providing full support during pregnancy, including ensuring the fulfillment of the food intake of future mothers and children. The health and nutritional status of the future father must also be maintained properly because it will have an influence on the future child [14]. Research conducted by Robbins states that men's preconception health status is important for improving healthy pregnancy outcomes [15].

Currently, the world has entered the era of the industrial revolution 4.0, the revolution provides challenges and opportunities for Indonesia, so in 2018 the government has launched the Making Indonesia Movement (GMI) 4.0. This movement is in line with the era of digitalization, which facilitates the integration of information for increasing productivity, efficiency, and service quality [16]. The National

Medium-Term Development Plan (RPJMN) 2020-2024 has a strategy to improve access and quality of health services toward revolution 4.0, especially in improving access and quality of maternal, child, Family Planning (KB), and reproductive health services [17].

One strategy to improve the knowledge and attitudes of couples about preconception preparation is through health counseling [18]. Health counseling improves health knowledge and change attitudes for the better in maintaining and improving their own health [19]. Several Application models have existed designed to improve the well-being of mothers and children but focus more on knowledge around pregnancy alone, while for preconception preparation there has not been developed [20].

The study of the preconception counseling model development program through the “Ayuk Sehat application” really needs to be reviewed and researched to measure the extent of public awareness to conduct a medical examination before pregnancy [21]. The development of this android-based preconception model was implemented to make it easier for couples to access and get information easily without having to visit health facilities. To be able to understand and strive for the best way can be thought of the couple so that the right and correct maximum results are obtained to plan a healthy birth baby.

1. Methods

Descriptive statistical analysis in this study was carried out using the average value (mean) on each variable indicator or statement indicator in the questionnaire with a case experience test. Measurement of user experience can be done in qualitative and quantitative ways. One method of measuring user experience is to use the User Experience Questionnaire

(UEQ). UEQ is a measurement that is considered to provide more advantages because it can provide comprehensive measurement results to the user experience [19]. The study population was 40 brides-to-be couples with details of 10 prospective wives and 10 prospective husbands, purposive sampling techniques. This study was approved by the Research Ethics Committee of the Medical Faculty of Andalas University, Description of Ethical Approval No: 587/UN.16.2/KEP-FK/2021. Informed consent was obtained from all participants involved in the usability testing of Preconception Counseling Model Development through Android applications on brides-to-be to prepare a healthy birth baby. All methods were performed in accordance with the relevant guidelines and regulations.

2. Results

2.1. Questionnaire Average Grading Scale

Descriptive statistical analysis in this study was carried out using the mean value of each variable indicator or statement indicator in the questionnaire. The meaning of the average value is given based on the index of values in the table below (Table 1):

Table 1 Questionnaire average grading scale

Average value range	Information
> 0.8	Positive evaluation
-0,8 – 0,8	Neutral evaluation
< -0.8	Negative evaluation

2.2. UEQ Scale Preconception Counseling for Prospective Husbands Using Android Application

The results of the study on the interpretation of the 6 scales in the UEQ questionnaire can be seen in the table below (Table 2):

Table 2 UEQ scale preconception counseling for prospective husbands of Android application users

Scale	Indicators	Code	Mean	Interpretation	
1 Attractiveness	Troublesome	Fun	ATT1	2,9	Positive Evaluation
	Good	Bad	ATT2	0,8	Neutral Evaluation
	Disliked	Encouraging	ATT3	0,4	Neutral Evaluation
	Uncomfortable	Comfortable	ATT4	2,9	Positive Evaluation
	Attractive	Not attractive	ATT5	-0,4	Negative Evaluation
2 Perspicuity	User-friendly	Not user-friendly	ATT6	1,8	Positive Evaluation
	Incomprehensible	Understandable	PER1	2,9	Positive Evaluation
	Easy to learn	Difficult to learn	PER2	0,9	Positive Evaluation
	Complicated	Simple	PER3	2,7	Positive Evaluation
	Clear	Fluster	PER4	-0,4	Negative Evaluation
3 Efficiency	Fast	Slow	EFF1	1,2	Neutral Evaluation
	Inefficient	Efficient	EFF2	2,9	Positive Evaluation
	Impractical	Practical	EFF3	2,9	Positive Evaluation
	Organized	Messy	EFF4	0,2	Neutral Evaluation
4 Dependability	Unpredictable	Predictable	DEP1	2,5	Positive Evaluation
	Blocking	Support	DEP2	2,9	Positive Evaluation
	Safe	Insecure	DEP3	1,2	Positive Evaluation
	Meet expectations	Not meeting expectations	DEP4	0,3	Neutral Evaluation
5 Stimulation	Useful	Less useful	STI1	1,3	Positive Evaluation
	Dull	Engrossing	STI2	2,5	Positive Evaluation

Continuation of Table 2					
6 Novelty	Unattractive	Pull	STI3	2,5	Positive Evaluation
	Motivate	Not motivating	STI4	0,3	Neutral Evaluation
	Creative	Monotonous	NOV1	1,9	Positive Evaluation
	Creative	Conventional	NOV2	0,4	Neutral Evaluation
	Customarily	Leading	NOV3	2,5	Positive Evaluation
	Conservative	Innovative	NOV4	2,8	Positive Evaluation

2.3. UEQ Scale Preconception Counseling for Future Wives Using Android Application

The results of the study on the interpretation of the

6 scales in the UEQ questionnaire can be seen in the table below (Table 3):

Table 3 UEQ scale preconception counseling for prospective wives of Android application users

Scale	Indicators		Code	Mean	Interpretation
1 Attractiveness	Troublesome	Fun	ATT1	2,7	Positive Evaluation
	Good	Bad	ATT2	0,9	Positive Evaluation
	Disliked	Encouraging	ATT3	1,3	Positive Evaluation
	Uncomfortable	Comfortable	ATT4	2,6	Positive Evaluation
	Attractive	Not attractive	ATT5	0,3	Neutral Evaluation
	User-friendly	Not user-friendly	ATT6	1,3	Positive Evaluation
2 Perspicuity	Incomprehensible	Understandable	PER1	2,7	Positive Evaluation
	Easy to learn	Difficult to learn	PER2	1,1	Positive Evaluation
	Complicated	Simple	PER3	2,6	Positive Evaluation
3 Efficiency	Clear	Fluster	PER4	0,2	Neutral Evaluation
	Fast	Slow	EFF1	1,2	Neutral Evaluation
	Inefficient	Efficient	EFF2	2,9	Positive Evaluation
	Impractical	Practical	EFF3	2,9	Positive Evaluation
4 Dependability	Organized	Messy	EFF4	0,2	Neutral Evaluation
	Unpredictable	Predictable	DEP1	2,4	Positive Evaluation
	Blocking	Support	DEP2	2,7	Positive Evaluation
	Safe	Insecure	DEP3	0,9	Positive Evaluation
5 Stimulation	Meet expectations	Not meeting expectations	DEP4	0,8	Neutral Evaluation
	Useful	Less useful	STI1	1,1	Positive Evaluation
	Dull	Engrossing	STI2	2,5	Positive Evaluation
	Unattractive	Pull	STI3	2,5	Positive Evaluation
6 Novelty	Motivate	Not motivating	STI4	0,9	Positive Evaluation
	Creative	Monotonous	NOV1	0,6	Neutral Evaluation
	Creative	Conventional	NOV2	0,7	Neutral Evaluation
	Customarily	Leading	NOV3	2,4	Positive Evaluation
	Conservative	Innovative	NOV4	2,7	Positive Evaluation

Tables 2 and Table 3 show the results of the evaluation of each user experience measurement variable using the User Experience Questionnaire (UEQ) on the Android application obtained from 20 respondents who filled out questionnaires on the aspects of attractiveness, perspicuity, efficiency, dependability, and stimulation and novelty managed to get an average score above 0.8. After the average value (mean) of each variable is obtained, a comparison of the average value is carried out against the benchmark data set. A comparison of the values obtained with the data on the benchmark is carried out to see the relative quality of android application usage compared to other products (Fig. 1).

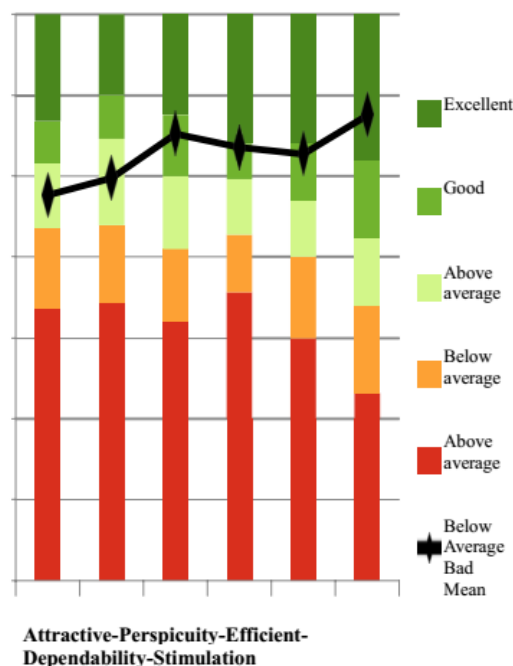


Fig. 1 Comparison average benchmarks by UEQ Data Tools

Based on Fig. 1, it can be seen that compared to other products, the Android application gets excellent (excellent) values in the novelty aspect and good (good) in the aspects of efficiency, accuracy and stimulation, while the aspects of attractiveness and clarity get above average values (above average).

Based on the results of descriptive statistical analysis carried out previously, the following conclusions can be drawn: According to android application users, the variables attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty get a positive evaluation value. The efficiency variable gets the highest average value, while the attractiveness variable gets the lowest average value. When viewed per item on variable attractiveness, users find the android app fun, exhilarating, convenient, and user-friendly. However, users feel that the android app is a neutral product on attractive/unattractive items. When viewed per item on perspicuity variables, users find the android app understandable, easy to learn, simple yet the user rates neutral on clear/confusing. When viewed per item on variable efficiency, users feel that the android application is efficient, practical, fast/slow, and organized/messy. When viewed per item on variable dependability, users feel that the android app is predictable and support safe/unsafe and obtain a neutral rating on items meeting expectations/not meeting expectations. If viewed per item on the stimulating variable, after the bride-to-be couple gets preconception health counseling through this android application, such as the bride-to-be couple can determine the nutritional status before pregnancy, know good nutrition, a healthy lifestyle, and the diseases that exist in her, so that the bride-to-be couple can prepare their body health in advance in preparing a healthy birth baby [22].

For this reason, this preconception counseling model is very useful, exciting, and interesting, thus motivating the bride-to-be couple to prepare a healthy baby. When viewed per item on the novelty variable, users feel that the android application is leading, creative/monotonous, creative/conventional, and prevalent and conservative. Compared to other products, the efficiency variable gets the highest benchmark value, which is excellent (excellent). The variables of efficiency, accuracy, and stimulation get good values (good) and attractiveness variables (above average) [23]. The preconception counseling application model is a valid and appropriate model for preconception counseling for prospective brides. This application method is very suitable to increase knowledge and perception as well as awareness of the bride and groom to determine what preparations are both physical, mental and nutritional and personal hygiene that is right in the household and has children later [24].

The android application model of preconception

counseling as a health promotion intervention, preconception counseling on knowledge and attitudes to prepare for pregnancy before marriage, increasing knowledge and positive perceptions in the form of scenarios, and health promotion more accessible to couples of young brides-to-be. The preconception counseling android application is a program that explores, identify, educate, describe understanding and roles, as well as preparation and practice through brides-to-be health checks at a health center or advice during marriage hearings given by health center staff as facilitators and provide information and dedication about the use of android-based applications [25].

It is hoped that health workers and couples of brides-to-be can exchange information or share, build networks, share experiences and skills in preparing themselves and their partners for preconception, reproductive health problems, nutrition, personal hygiene. So that each couple feels less awkward and confident when entering the pregnancy period and the changes that exist in her and can improve emotional control, lifestyle, and apply balanced nutrition like the bride-to-be's words [26]. This is in accordance with research, which states that High motivation to perform and obtain preconception screening in the bridal group after being give preconception health education [25]. As a logical consequence of the results of this study, it is necessary to apply special policies and rules related to regulations and technicalities how to make couples take advantage of the existence, function, and use of android-based preconception counseling applications when coming to the health center and the Office of Religious Affairs. It is hoped that through the health center and the Office of Religious Affairs, this application will be used as a tool (instrument) that can accommodate all education about health and preconception preparation [27-30]. How to prevent the risk of pregnancy and indications in the fetus and mother, as well as accompanying sexual diseases are known when examining brides-to-be. The health center and the Office of Religious Affairs participated in socializing and distributing the benefits of using this application to promote brides-to-be preparation for pregnancy after marriage. The use of this application as a model for preconception counseling is expected to change the perception of brides-to-be to prepare for healthy pregnancies and babies born healthy [25].

3. Conclusion

The attractiveness variable gets a positive evaluation value. Almost all indicators on the attractiveness variable get a positive evaluation value, except for the ATT5 indicator (attractive/unattractive) get a neutral evaluation value. The Perspicuity variable gets a positive evaluation value. All indicators on the perspicuity variable managed to obtain a positive evaluation value except for PER 4 (clear/confusing).

The efficiency variable got a positive evaluation value.

All indicators of variable efficiency. Stimulation and dependability get a positive evaluation value. All indicators on the dependability variable managed to obtain a positive evaluation value except for DEP4 (meeting expectations / not meeting expectations) with a neutral evaluation. The novelty variable got a positive evaluation value. Almost all indicators in the novelty variable get positive evaluation values, except for NOV 1 (creative/monotonous) and NOV2 (creative/conventional indicators get neutral evaluation values. The conclusions of the study are obtained according to the android application user; the variables attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty get a positive evaluation value of 10. Based on the expert test results, this android application material is included in the very decent category, according to media experts, this application is included in the very decent category, and based on the results of field trials, this 'Ayuk Sehat' application is included in the very feasible category for use.

The preconception counseling model using the android application is suitable and novel for use in prospective brides-to-be. Preconception application model development can be recommended as a medium of counseling and education on factors (knowledge, attitudes, perceptions) effectively in providing information to the bride-to-be couple. Such application is able to increase knowledge, attitudes, and perceptions. The most important thing is that couples have a positive influence on efforts to increase healthy babies as a contribution and role in the process of maternal pregnancy until the child is born later; all information, knowledge, and nutritional status are needed that are sufficient and sustainable in planning a healthy baby. The new application is recommended for the ministry of health through the Health Office in collaboration with the Office of Religious Affairs (KUA) to be able to make operational policies related to the use of preconception extension model applications As a promotional and educational medium preparing healthy birth babies for brides-to-be couples who want to get married by attaching a certificate of counseling Healthy preconception as one of the administrative requirements for marriage and should be done 3 months before marriage.

References

[1] KHAMIS N, BASHAWRI J, AL H, AL J, AL A, QADI M, MILAAT W., and FEDA H. Premarital Screening and Genetic Counseling program : Knowledge , attitude , and satisfaction of attendees of governmental outpatient clinics in Jeddah. *Journal of Infection and Public Health*, 2013, 6(1): 41–54. <http://dx.doi.org/10.1016/j.jiph.2012.05.001>

[2] BINDHANI B.K., DEVI N.K., and NAYAK J.K. Knowledge, awareness, and attitude of premarital screening with special focus on sickle cell disease : a study from Odisha. *Journal of Community Genetics*, 2020, 11(4): 445–

449. <https://doi.org/10.1007/s12687-020-00471-7>

[3] OJIFINNI O.O., & IBISOMI L. Preconception care practices in Nigeria : a descriptive qualitative study. *Reproductive Health*, 2020, 17: 172.

<https://doi.org/10.1186/s12978-020-01030-6>

[4] CHANDRANIPAPONGSE W., & KOREN D. Preconception counseling for preventable risks. *Canadian Family Physician Médecin de Famille Canadien* , 2013, 59: 737–739. <https://pubmed.ncbi.nlm.nih.gov/23851536/>

[5] TOWNE J. E. Premarital Counseling. *The Medical clinics of North America*, 45: 53-62. <https://pubmed.ncbi.nlm.nih.gov/13777772/>

[6] BENER A., MULLA M. A., and CLARKE A. Premarital Screening and Genetic Counseling Program : Studies from an Endogamous Population. *International Journal of Applied & Basic Medical Research*, 2019, 9(1): 20-26. <https://doi.org/10.4103/ijabmr.ijabmr.42.18>

[7] MURUGESU L., HOPMAN M. E., VAN VOORST S.F., ROSMAN A.N., and FRANSEN M.P. Systematic Development of Materials for Inviting Low Health-Literate Individuals to Participate in Preconception Counseling. *International journal of environmental research and public health*, 2019, 16(21): 4223. <https://doi.org/10.3390/ijerph16214223>

[8] PURI S., DHIMAN A., and BANSAL S. Premarital Health Counseling : A Must. *Indian Journal of Public Health*, 2016, 60(4): 287–290. <https://doi.org/10.4103/0019-557x.195860>

[9] SKOGSDAL Y., FADL H., CAO Y., KARLSSON J., and TYD T. An intervention in contraceptive counseling increased the knowledge about fertility and awareness of preconception health — a randomized controlled trial. *Uppsala Journal of Medical Sciences*, 2019, 124(3): 203–212. <https://doi.org/10.1080/03009734.2019.1653407>

[10] ALSANIE N. A., and ALHRAIWIL N. J. Awareness of Premarital Screening and Genetic Counseling among Saudis and its Association with Sociodemographic Factors : A National Study. *Journal of Multidisciplinary Healthcare*, 2021, 14: 389–399. <https://doi.org/10.2147/jmdh.s296221>

[11] ZAIEN S. Z., EL-HOUFEY A. A., ALQAHTANI H., ABD H., EL E., and ELGZAR W. T. Predictors of premarital screening and genetic counseling knowledge and attitude among deaf and hard hearing females in Tabuk, Saudi Arabia. *Journal of Medicine and Life*, 2022, 15(3): 379–386. <https://doi.org/10.25122/jml-2021-0165>

[12] EL SINTA BUSTAMI L., YULIZAWATI Y., INSANI A. A., and NURDIYAN A. The effect of health education peer education methods on preconception screening on the attitudes and motivations of women of childbearing age. *2-Trick: Shoots Health Research*, 2017, 7(2): 62-66. <http://dx.doi.org/10.25077/jom.1.2.11-20.2016>

[13] YULIVANTINA E. V., MUFDLILAH, and KURNIAWATI H. F. Implementation of Preconception Screening for Brides-to-be. *Journal of Reproductive Health*, 2021, (8)1: 47-53. <https://doi.org/10.22146/jkr.55481>

[14] AL-QAHTANI F. S., ALFAHAD M. I., ALSHAHRANI A. M. M., ALMALIH H. S., AL-MALKI A. S. Q., ALSHEHRI T. K., ALQHTANI A. A. N., AL-QAHTANI A. M., ALFAIFI S. H., ALASMARI R. F. A., BHARTI R. K., and CHAUDHARY S. Perception of premarital counseling among King Khalid University students. *Journal of Family Medicine and Primary Care*, 2019, 8(8): 2607-2611. <https://doi.org/10.4103/jfmpe.jfmpe.364.19>

- [15] FRANSEN M. P., MIRRIAM H., LAXSINI M., ROSMAN A. N., and SMITH S. K. Preconception Counselling For Low Health Literate Women : An Exploration of Determinants in the Netherlands. *Reproductive Health*, 2018, 15: 192. <https://doi.org/10.1186/s12978-018-0617-1>
- [16] BATRA P., MANGIONE C. M., CHENG E., STEERS W. N., NGUYEN T.A., BELL D., KUO A. A., and GREGORY K. D. A Cluster Randomized Controlled Trial of the MyFamilyPlan Online Preconception Health Education Tool. *American Journal of Health Promotion*, 2018, 32(4): 897–905. <https://doi.org/10.1177/0890117117700585>
- [17] NOVRIYANTI S. *Pengaruh Penerapan Pendekatan Inkuiri Terbimbing Dengan Menggunakan Google Classroom dan Google Meet Pada Pembelajaran Gejala Pemanasan Global Terhadap Pemahaman dan Keterlibatan Siswa Kelas XI IPA 2 SMA Katolik Soverdi Tuban-Bali*. PhD Thesis, Sanata Dharma University, 2021. <http://repository.usd.ac.id/40762/>
- [18] BOULET L., MORGAN I., D'ANGELO D. V., ZAPATA L. B., MORROW B., SHARMA A., and KROELINGER C. D. Disparities in preconception health indicators - Behavioral risk factor surveillance system, 2013-2015, and pregnancy risk assessment monitoring system, 2013-2014. *Centers for Disease Control and Prevention (US) Epidemiology Program Office*, 2018, 67(1): 1–16. <https://doi.org/10.15585/mmwr.ss6701a1>
- [19] RATNASARI A. Designing Educational Applications for Brides and Grooms to Improve Android-Based Pre-Pregnancy Knowledge. *Seminar Nasional Informatika Medis*, 2018: 51–56. <https://journal.uui.ac.id/snimed/article/download/11884/pdf>
- [20] JEAN J., COLL A., MONDA M., POTTER J., and JONES D. Perspectives on Safer Conception practices and preconception counseling among women living with HIV. *Health Care Women International*, 2016, 37(10): 1096-1118. <https://doi.org/10.1080/07399332.2015.1107068>
- [22] VAN DER ZEE B., DE BEAUFORT I. D., STEEGERS E. A. P., and DENKTA S. Perceptions of preconception counselling among women planning a pregnancy: a qualitative study. *Family Practice*, 2013, 30(3): 341–346. <https://doi.org/10.1093/fampra/cms074>
- [23] OPRAY N., GRIVELL R. M., and DEUSEN A. R. Directed Preconception health programs and Interventions for Improving Pregnancy Outcomes for Women who are overweight or obese (review). *Cochrane Database of Systematic Review*, 2015, 7: CD010932. <https://doi.org/10.1002/14651858.cd010932.pub2>
- [24] YOU X., TAN H., HU S., WU J., JIANG H., PENG A., DAI Y., WANG L., GUO S., and QIAN X. Effects of preconception counseling on maternal health care of migrant women in China: a community-based, cross-sectional survey. *BioMed Central Pregnancy and Childbirth*, 2015, 15: 55. <https://doi.org/10.1186/s12884-015-0485-4>
- [25] HUSSEIN, N., KAI J., and QURESHI. The Effects of Preconception Interventions on Improving reproductive Health and pregnancy outcomes in primary care : A Systematic review. *European Journal of General Practice*, 2016, 22(1): 42-52. <https://doi.org/10.3109/13814788.2015.1099039>
- [26] LASSI Z. S., MANSOOR T., SALAM R. A., BHUTTA S. Z., DAS J. K., and BHUTTA Z. A. Review of nutrition guidelines relevant for adolescents in low- and middle-income countries. *Annals of the New York Academy of Sciences*, 2017, 1393(1): 51–60. <https://doi.org/10.1111/nyas.13332>
- [27] LASSI Z., IMAN A., and DEAN S. B. Preconception Care: Caffeine, smoking, alcohol, drugs, and other environmental chemical/radiation exposure. *Reproductive Health*, 2014, 3(3): 6. <https://doi.org/10.1186/1742-4755-11-s3-s6>
- [28] EKSTRAND RAGNAR M., NIEMEYER HULTSTRAND J., TYDÉN T., and LARSSON M. Development of an evidence-based website on preconception health. *Upsala Journal of Medical Sciences*, 2018, 123(2): 116–122. <https://doi.org/10.1080/03009734.2018.1476423>
- [29] ZHOU Q., ZHANG S., WANG Q., SHEN H., TIAN W., CHEN J., ACHARYA G., and LI X. China's community-based strategy of universal preconception care in rural areas at a population level using a novel risk classification system for stratifying couples' preconception health status. *BMC Health Services Research*, 2016, 16(1): 689. <http://dx.doi.org/10.1186/s12913-016-1930-4>
- [30] SCHNEIDER J. L., GODDARD K. A., DAVIS J., WILFOND B., KAUFFMAN T. L., REISS J. A., GILMORE M., HIMES P., LYNCH F. L., LEO M. C., and MCMULLEN C. Original Research B "Is It Worth Knowing?" Focus Group Participants Perceived Utility of Genomic Preconception Carrier Screening. *Journal of Genetic Counseling*, 2016, 25(2): 135–145. <https://doi.org/10.1007/s10897-015-9851-7>

参考文献:

- [1] KHAMIS N, BASHAWRI J, AL H, AL J, AL A, QADI M, MILAAT W., 和 FEDA H. 婚前筛查和遗传咨询计划：吉达政府门诊就诊者的知识、态度和满意度。感染与公共卫生杂志，2013年，6(1)：第41-54页。<http://dx.doi.org/10.1016/j.jiph.2012.05.001>
- [2] BINDHANI B.K., DEVI N.K., 和 NAYAK J.K. 尤其关注镰状细胞病的婚前筛查的知识、意识和态度：来自奥里萨邦的一项研究。社区遗传学杂志，2020，11(4)：第445–449页。<https://doi.org/10.1007/s12687-020-00471-7>
- [3] OJIFINNI O.O., 和 IBISOMI L. 尼日利亚的孕前护理实践：一项描述性定性研究。生殖健康，2020年，17：第172条。<https://doi.org/10.1186/s12978-020-01030-6>
- [4] CHANDRANIPAPONGSE W., 和 KOREN D. 针对可预防风险的孕前咨询。加拿大家庭医生 加拿大家庭医生，2013，59：第737–739页。<https://pubmed.ncbi.nlm.nih.gov/23851536/>
- [5] TOWNE J. E. 婚前咨询。北美的医疗诊所，45：第53–62页。<https://pubmed.ncbi.nlm.nih.gov/13777772/>
- [6] BENER A., MULLA M. A., 和 CLARKE A. 婚前筛查和遗传咨询计划：来自内婚人群的研究。国际应用与基础医学研究杂志，2019，9(1)：第20-26页。https://doi.org/10.4103/ijabmr.ijabmr_42_18
- [7] MURUGESU L., HOPMAN M. E., VAN VOORST S.F.,

- ROSMAN A.N., 和 FRANSEN M.P. 邀请健康素养低的个人参与孕前咨询的材料的系统开发。国际环境研究与公共卫生杂志, 2019, 16(21): 第 4223 页 . <https://doi.org/10.3390/ijerph16214223>
- [8] PURI S., DHIMAN A., 和 BANSAL S. 婚前健康咨询: 必须。印度公共卫生杂志, 2016, 60(4): 第 287-290 页. <https://doi.org/10.4103/0019-557x.195860>
- [9] SKOGSDAL Y., FADL H., CAO Y., KARLSSON J., 和 TYD T. 避孕咨询干预增加了对生育能力的了解和孕前健康意识——一项随机对照试验。乌普萨拉医学科学杂志, 2019, 124(3): 第 203-212 页 . <https://doi.org/10.1080/03009734.2019.1653407>
- [10] ALSANIE N. A., 和 ALHRAIWIL N. J. 沙特人对婚前筛查和遗传咨询的认识及其与社会人口因素的关联: 一项全国性研究。多学科医疗保健杂志, 2021, 14: 第 389-399 页. <https://doi.org/10.2147/jmdh.s296221>
- [11] ZAIEN S. Z., EL-HOUFEY A. A., ALQAHTANI H., ABD H., EL E., 和 ELGZAR W. T. 沙特阿拉伯塔布克聋哑和重听女性婚前筛查和遗传咨询知识和态度的预测因素。医学与生命杂志, 2022, 15(3): 第 379-386 页. <https://doi.org/10.25122/jml-2021-0165>
- [12] EL SINTA BUSTAMI L., YULIZAWATI Y., INSANI A. A., 和 NURDIYAN A. 健康教育同伴教育方法对育龄妇女先入为主筛查态度和动机的影响 2-技巧: 射击健康研究, 2017, 7(2): 第 62-66 页 . <http://dx.doi.org/10.25077/jom.1.2.11-20.2016>
- [13] YULIVANTINA E. V., MUFDLILAH, 和 KURNIAWATI H. F. 对准新娘进行孕前筛查。生殖健康杂志, 2021, (8)1: 第 47-53 页 . <https://doi.org/10.22146/jkr.55481>
- [14] AL-QAHTANI F. S., ALFAHAD M. I., ALSHAHRANI A. M. M., ALMALIH H. S., AL-MALKI A. S. Q., ALSHEHRI T. K., ALQHTANI A. A. N., AL-QAHTANI A. M., ALFAIFI S. H., ALASMARI R. F. A., BHARTI R. K., 和 CHAUDHARY S. 哈立德国王大学学生对婚前咨询的看法。家庭医学与初级保健杂志, 2019, 8(8): 第 2607-2611 页. https://doi.org/10.4103/jfmpc.jfmpc_364_19
- [15] FRANSEN M. P., MIRRIAM H., LAXSINI M., ROSMAN A. N., 和 SMITH S. K. 低健康文化女性的孕前咨询: 荷兰决定因素的探索。生殖健康, 2018, 15: 第 192 页. <https://doi.org/10.1186/s12978-018-0617-1>
- [16] BATRA P., MANGIONE C. M., CHENG E., STEERS W. N., NGUYEN T.A., BELL D., KUO A. A., 和 GREGORY K. D. 我的家庭计划 在线先入为主健康教育工具的整群随机对照试验。美国健康促进杂志, 2018, 32(4): 第 897-905 页 . <https://doi.org/10.1177/0890117117700585>
- [17] NOVRIYANTI S. 应用使用谷歌 课堂和 谷歌会议的引导式探究方法学习全球变暖症状对索维尔迪天主教高中图班-巴厘岛 班级 XI 国际音标 2 学生的理解和参与的影响 . 佛法 大学 博士 论文 , 2021. <http://repository.usd.ac.id/40762/>
- [18] BOULET L., MORGAN I., D'ANGELO D. V., ZAPATA L. B., MORROW B., SHARMA A., 和 KROELINGER C. D. 孕前健康指标差异-行为危险因素监测系统, 2013-2015 年和妊娠风险评估监测系统, 2013-2014 年。美国疾病控制与预防中心流行病学项目办公室, 2018, 67(1): 第 1-16 页 . <https://doi.org/10.15585/mmwr.ss6701a1>
- [19] RATNASARI A. 为新娘和新郎设计教育应用程序以提高基于 安卓 的孕前知识。研讨会国家信息医学, 2018: 第 51-56 页 . <https://journal.uui.ac.id/snimed/article/download/11884/pdf>
- [20] JEAN J., COLL A., MONDA M., POTTER J., 和 JONES D. 关于感染艾滋病毒的妇女更安全的受孕实践和孕前咨询的观点。保健妇女国际, 2016, 37(10): 第 1096-1118 页. <https://doi.org/10.1080/07399332.2015.1107068>
- [22] VAN DER ZEE B., DE BEAUFORT I. D., STEEGERS E. A. P., 和 DENKTA S. 计划怀孕的妇女对孕前咨询的看法: 一项定性研究。家庭诊所, 2013, 30(3): 第 341-346 页. <https://doi.org/10.1093/fampra/cms074>
- [23] OPRAY N., GRIVELL R. M., 和 DEUSEN A. R. 针对超重或肥胖女性改善妊娠结局的定向孕前健康计划和干预措施 (综述)。科克伦 系统评价数据库, 2015, 7: 第 CD010932 页 . <https://doi.org/10.1002/14651858.cd010932.pub2>
- [24] YOU X., TAN H., HU S., WU J., JIANG H., PENG A., DAI Y., WANG L., GUO S., 和 QIAN X. 孕前咨询对中国流动妇女孕期保健的影响: 基于社区的横断面调查。生物医学中心妊娠和分娩中心, 2015, 15: 第 55 页. <https://doi.org/10.1186/s12884-015-0485-4>
- [25] HUSSEIN, N., KAI J., 和 QURESHI. 孕前干预对改善初级保健中的生殖健康和妊娠结局的影响: 系统评价。欧洲全科医学杂志, 2016, 22(1): 第 42-52 页 . <https://doi.org/10.3109/13814788.2015.1099039>
- [26] LASSI Z. S., MANSOOR T., SALAM R. A., BHUTTA S. Z., DAS J. K., 和 BHUTTA Z. A. 审查与低收入和中等收入国家青少年相关的营养指南。纽约科学院年鉴, 2017, 1393(1): 第 51-60 页. <https://doi.org/10.1111/nyas.13332>
- [27] LASSI Z., IMAN A., 和 DEAN S. B. 孕前护理: 咖啡因、吸烟、酒精、药物和其他环境化学/辐射暴露。生殖

健康, 2014, 3(3): 第 6 页. <https://doi.org/10.1186/1742-4755-11-s3-s6>

[28] EKSTRAND RAGNAR M., NIEMEYER HULTSTRAND J., TYDÉN T., 和 LARSSON M. 开发一个关于孕前健康的循证网站。乌普萨拉医学科学杂志, 2018, 123(2): 第 116–122 页 . <https://doi.org/10.1080/03009734.2018.1476423>

[29] ZHOU Q., ZHANG S., WANG Q., SHEN H., TIAN W., CHEN J., ACHARYA G., 和 LI X. 中国基于社区的人口水平农村地区普遍孕前保健策略使用新的风险分类系统对

夫妇的孕前健康状况进行分层。生物医学中央卫生服务研究, 2016, 16(1): 第 689 页 .

<http://dx.doi.org/10.1186/s12913-016-1930-4>

[30] SCHNEIDER J. L., GODDARD K. A., DAVIS J., WILFOND B., KAUFFMAN T. L., REISS J. A., GILMORE M., HIMES P., LYNCH F. L., LEO M. C., 和 MCMULLEN C. 原创研究 B“它值得知道吗?” 焦点小组参与者认为基因组先入为主筛选的效用。遗传咨询杂志, 2016, 25(2): 第 135–145 页. <https://doi.org/10.1007/s10897-015-9851-7>