

Health care provider s' knowledge, attitude and practice regarding pre-conception care

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Abstract

Pre-conception care is one of the most important components of health care for women in reproductive age that seek to improve women's health by pregnancy risk-assessment, education, and diagnostic interventions. This study aimed to assess health care providers' knowledge, attitude and practice about pre-conception care. This was a descriptive cross-sectional study comprising all health care providers in the city of Khoys as the study population, selected in method (218 persons). Data were collected through a field survey using a researcher constructed questionnaire, to which 167 subjects (77%) responded. The collected data were analyzed by SPSS software using descriptive statistic and χ^2 tests. Findings of present study showed that physicians (63.6%), health technicians (68%), and healthcare social workers (74.6%) had moderate knowledge and Bachelors of Science in family health (66.7%) had a good knowledge about preconception care. All groups had a positive attitude toward preconception care. Practice of nearly 70% of physicians and 75% of Bachelors of Science in family health in all pre-conception care fields was poor, but majority of family physician project midwives (64.7%) and healthcare social workers (52.4%) had a moderate practice in this area. A significant correlation was observed between study subjects' educational qualifications and their knowledge, attitude, and practice.

Given the results obtained in this study, staff training, preparation for applicability of information, and increased sensitivity of health care providers and others involved in providing obstetrics and health services to pre-conception care appear necessary for improvement of services in this area.

Keywords: Attitude, Knowledge, Practice

Introduction

Pre-conception care (PCC) is one of the most important components of health care for women in reproductive age [1]. PCC is implementation of a set of interventions to identify and modify biomedical, behavioral, and social risks to women's health and pregnancy outcome through control and prevention, with emphasis on the importance of commencement of these

interventions prior to conception to maximize the best effect on pregnancy outcome [2]. Mother's and child's health outcomes such as mortality, preterm birth, Low Birth Weight (LBW), are considered as indicators of overall health status in a society. Every day, nearly 800 women die of preventable complications associated with pregnancy and childbirth. Most of these complications are created

during pregnancy, and some have existed prior to pregnancy, and worsened during pregnancy [3]. Moreover, the high incidence of unintended pregnancies in the world (75 million annually) [4], exhibits the importance of PCC much more clearly. The incidence of unintended pregnancy varies across different countries, and has been reported over 50% in the U.S.A., 28% in Nigeria, and 69% in South Africa [5]. Incidence of unintended pregnancy in different parts of Iran has been reported to vary from 26 to 47% [6,7] Annually, 15 million premature births occur worldwide. Of the 5 leading fatal causes of infant mortality, premature birth is the second, claiming 1.1 million infant's lives each year [8]. In Iran, maternal mortality rate is 25 per 100,000 live births, infant mortality is 14.7 in every 1,000 live births, and incidence of LBW is 7.2% [9]. Despite advances and improvements in access to prenatal care, no reduction in the incidence of congenital abnormalities, preterm birth, LBW, and maternal mortality rates have been observed in many countries, which is indicative of inadequacy of relying merely on prenatal care to improve pregnancy outcomes [10].

According to many medical experts, women's health before pregnancy leads to a better pregnancy outcome. Obvious risk factors such as smoking, obesity, anemia, self-prescribing medicine, and medical problems that cause adverse pregnancy outcomes are present in majority of women in reproductive age, and if not controlled before pregnancy, they will result in adverse effects on the pregnancy [11]. Recently, in Iran, PCC is considered part of integrated care with prenatal care and also, part of health personnel's responsibilities. Recently, in the city of Khoy, PCC is performed in health centers, but it is not yet part of the routine health care in all cities. In a study in 2006, it was shown that obstetricians' and gynecologists' practice was poorer during PCC than in prenatal, and administration of folic acid and genetic counseling in prenatal was more than that in pre-conception period [12]. In a study, 93% of midwives were familiar with the concept of PCC, 71% of them had previously performed these cares, and 55% believed PCC should be

part of their care duties and argued that they did not have the time or adequate skills for such cares [13]. In a study by Abdolahi in 2005, health experts had moderate knowledge about folic acid and other aspects of folat metabolism relationship with diseases other than neural tube defects [14]. Health care providers including family physicians, midwives, bachelors of science in family health, and healthcare social workers are the main sources of maternal and child's health improvements. Health personnel's knowledge of PCC will lead to their improved practice. Knowledge is necessary for properly performing a duty and acting without knowledge distances people from their goal, rendering the outcome useless. One of the verifiable factors that reflect proper planning of a health issue is assessment of personnel's knowledge and practice of that issue. Review of literatures reveals that there are few studies on pre-conception care, and particularly on knowledge, attitude, and practice of health care providers in this area in the country. Considering the novelty of pre-conception care program, we intended to conduct a study with the principle aim to identify personnel's knowledge, attitude, and practice in PCC in an attempt to provide an answer to the question "what is the level of knowledge, attitude, and practice of health care providers in Khoy city?", so that by identifying the current status, strengths and weaknesses and operational difficulties of this important health issue could be recognized, and by developing appropriate plans and supervision of health care providers' education and interventions in this area, steps could be taken to improve PCC to enhance maternal and child's and family, and ultimately community's health.

Method

This was a descriptive cross-sectional study comprising all health care providers in the city of Khoy as the study population, selected in census method (218 persons). Data were collected through a field survey using a researcher conducted questionnaire, whose content had been derived from the literature

review and country guidelines for obstetrics services and mother-friendly hospitals, and contains knowledge questionnaires (15, 4-point items), attitude (11 items), and practice (17 items) using Likert scale and social and personal characteristics. A total of 167 people completed the questionnaire (return rate of 77%). Validity of the questionnaire was assessed by content validity (interviewing 10 related science faculty members) and reliability was found through test-retest on 15 health employees with a 10-day interval ($r=0.86$). Each correct answer to knowledge questions scored 1 and each incorrect answer scored zero. Eventually, according to maximum scores, subjects were divided into three groups of poor knowledge (0- 5 marks), moderate knowledge (6- 10 marks), and good knowledge (11- 15 marks). Scoring of attitude questions was based on 5-point answers (from totally agree=5 to totally disagree=1 mark), and according to the final scores, people were divided into 3 groups of poor attitude (0- 17), moderate attitude [18,35] and positive attitude [36,55]. To evaluate people's practice, first 5-point answers were scored (always=5, often=4, occasionally=3, rarely=2, and never=1), and then score for each person was found through summing up scores of answers to every item. Mean score obtained in a range of 0- 85 marks was ranked in one of the 4 groups of very poor= <20 , poor=21- 42, moderate=43- 64, and good=65-85-, and frequency of scores in each group was calculated. Permission to conduct this

study was obtained from the health network officials, and after explanations and obtaining verbal consents of the subjects, questionnaires were issued. Where necessary, explanations were given about questions. Data were analyzed using descriptive statistics (frequency distribution, mean and standard deviation) and χ^2 test in SPSS-11.5 software. $P<0.05$ was considered the significant level.

Results

Participants' mean age was 31.6 ± 7.6 , ranging 21- 56 years. Majority of participants were female and married (66.5%), of the participants, 19.8% were physicians, 8.4% graduates with Bachelor's degrees, 34.1% with technicians, and 37.7% were healthcare social workers, of the 33 participating physicians, 51.5% were family physicians, 30.3% employed, and 18.2% were serving compulsory service, of the 14 bachelor's degree graduates, 85.7% were officially Bachelor of Science in family health and 14.3% were family physician project midwives. Of the 57 participating health technician graduates, 56.1% were officially employed family health technicians, 26.3% family physician project midwives, and 17.5% were part of human resources plan. The level of knowledge, attitude, and practice of health care providers in the PCC area are presented in Tables 1- 3 respectively.

Table 1 The relationship between Knowledge of pre-conception care and occupational groups in the study population

	Physicians	Bachelors of science in family health	Family health technicians	Family physician project midwives	Health care social workers
Poor knowledge	-	-	-	-	7(11.1)
Moderate knowledge	21(63.6)	4(33.3)	29(69)	7(41.2)	47(74.6)
Good knowledge	12(36.4)	8(66.7)	13(31)	10(58.8)	9(14.3)
Total	33(100)	12(100)	42(100)	17(100)	63(100)

df=4 P<0.001

Table 2 The relationship between attitude toward pre-conception care and occupational groups in the study population

	Physicians	Bachelors of science in family health	Family health technicians	Family physician project midwives	Health care social workers
Negative attitude	1(3)	-	-	-	-
Neutral attitude	7(21.2)	1(8.3)	7(16.7)	-	23(36.5)
Positive attitude	25(75.8)	11(91.7)	35(83.3)	17(100)	40(63.5)
Total	33(100)	12(100)	42(100)	17(100)	63(100)

df=4 P=0.008

Table 3 The relationship between practice in pre-conception care and occupational groups in the study population

	Physicians	Bachelors of science in family health	Family health technicians	Family physician project midwives	Health care social workers
Poor performance	23(69.7)	9(75)	21(50)	6(35.3)	30(47.6)
Moderate performance	10(30.3)	3(25)	21(50)	11(64.7)	33(52.4)
Good performance	-	-	-	-	-
Total	33(100)	12(100)	42(100)	17(100)	63(100)

df=4 P=0.06

In terms of knowledge of PCC, all family physician project doctors and midwives (100%), 85% of Bachelor of Science in family health and technicians, and 96% of healthcare social workers had awareness about PCC. Majority of physicians (88%) and over 99% of other health care providers were unaware of the most important period for teratogenic risk factors to the fetus (17- 57 days after conception). Thirty-two physicians (96.9%) and more than 65% of other health workers did not know the right time of conceiving after contraceptive use. Over 50% of family health team and midwives knew acid folic effects and when consumption should start. 25% of the family health team and 45% of midwives did not know daily dosage of folic acid. Majority of family health workers (57%) and 94% of midwives had rarely spoken to patients in relation to folic acid use, or prescribed it. Less than 50% of the above two groups knew of tacking double dose of folic acid. All family health workers and midwives believed that PCC has an important effect on pregnancy outcome and that it is an important health issue for women of reproductive age and over 50% of subjects considered it an important work priority. Majority of physicians and family health team (with bachelor's degree and technicians) (over 65%) did not pay attention to their patients' oral health. Nearly 90% of physicians had not talked with their patients about domestic violence and occupational stress. Over 50% of physicians had talked to patients about maternal care and chronic diseases. Results indicated that in relation to PCC, majority of family health workers (with bachelor's degree) (75%) had

poor practice, and 64.7% of midwives had moderate practice, and in these two groups the difference between level of knowledge and practice was insignificant. The highest rate of good practice of family health team was in relation to medication, chronic diseases, and Pap-smear, and the highest rate of good practice of midwives, in addition to the above cases, was in the area of STD. Majority of healthcare social workers (74.6%) had moderate knowledge, 63.5% had positive attitudes, and 52.4% had moderate practice in relation to PCC. There was a significant correlation between educational qualifications of study subjects and their knowledge and practice in PCC area, and knowledge of those with bachelor's degree was higher than other educational qualifications. Also, PCC practice of those with technicians and healthcare social workers was more than physicians and those with bachelor's degree. There was a significant correlation between work experience and knowledge, attitude, and practice in relation to PCC, with $P=0.054$, $P=0.006$, and $P=0.033$ respectively, and those with less work experience had more knowledge, more positive attitude, and higher practice compared to subjects with longer work experience. Younger people had more positive attitudes toward PCC ($P<0.05$).

Discussion

Results obtained in the present study showed that majority of physicians had moderate knowledge about PCC. Results of a study aiming to assess PCC knowledge of specialist doctors, obstetrics and gynecology

residents and midwives indicated low level of participants' knowledge [15]. All participating physicians were fully aware of the PCC field and items, folic acid role in fetus development, administration and dosage of folic acid and care of patients with diabetes before pregnancy, while, most (54%) had rarely talked with women about folic acid use, or prescribed it. In a study (2010) in India, it was shown that although majority of doctors were aware of folic acid role in preventing fetus neural tube defects, their knowledge of administration and supplementary dosage of folic acid was low [16], which is in agreement with results of the present study. Another study in Israel in 2008 showed that majority of doctors (94%) had administered folic acid supplement for women in reproductive age, but their knowledge of folic acid supplement was inadequate [17]. Considering results of the above studies, it can be argued that there is a gap between health workers' knowledge and practice in relation to folic acid supplement, and on the job training programs are required to bridge this gap. Given the importance of the PCC, and the most important period for teratogenic risks to the fetus (17- 57 days after conception), [2] most doctors and 99% of others were unaware of this period. Also, most physicians and other health workers did not know the right time for pregnancy after contraceptives stopping. Although use of hormone contraceptive pills or injection methods during conception don't have a teratogenic effect on the fetus, It is better to stop taking the pills and intrauterine devices at least two months before trying to conceive. During this interval, women can have the necessary preparation for pregnancy through changing lifestyle by using folic acid, a healthy diet, and quitting smoking [18]. Although several studies have shown that attention to oral health before and during pregnancy and in the intervals between pregnancies cause improved general maternal, fetus, and infant's health [19], in the present study, majority of health workers including physicians, family health team (with bachelor degree and technicians did not pay attention to their patients' oral health. Other

studies also indicate the same results, which agree with the results of the present study [20]. It should be noted that physiological changes during pregnancy, highly predispose pregnant mothers to various periodontal diseases. Results of a study by Bahri et al (2012) showed that education can influence pregnant mothers' short term knowledge, attitude and practice in relation to oral health [21]. In the present study, 90% of physicians had not spoken to their patients about domestic violence, occupational stress, or weight adjustment. Considering results of a study by Dadrass et al (2010) that showed a significant correlation between body mass index and duration of first and second labor periods, increased body mass index leads to increased cesarean rate in women, which shows importance of attention to body mass index during pre-conception [22]. Also, a study by the World Health Organization conducted in many countries showed that there is a correlation between spouse's violence against the wife and unintended pregnancies and miscarriages (that could lead to the mother's death in unsafe conditions). By preventing violence during pre-conception, risks associated with maternal and pregnancy health could be reduced [21]. In a study by Tough et al (2006) , less than 50% of family physicians and obstetrician-gynaecologists had questioned weight adjustment, occupational stress, psychiatric health, history of addiction or drug abuse during pregnancy [23], which has obvious differences with the present study. This could be attributed to the novelty of the subject in Iran, compared to the above study. Stressful night shifts and contact with environmental risk factors such as pesticides could lead to miscarriage in the first trimester, and it is necessary that physicians and health workers implement interventions to reduce risks and complications of pregnancy in relation to occupational hazards during pre-conception period [24]. In the present study, majority of physicians had talked to patients about maternal care and chronic diseases. A study showed that 52% of the 136 women who had negative pregnancy test results, had one medical risk factor that could adversely affect

pregnancy outcome [25]. Such studies indicate importance of attention to chronic diseases before attempting pregnancy. Generally, most physicians had a positive attitude toward pre-conception care. In the present study, all physicians believed that pre-conception care has a positive effect on pregnancy outcome, and considered PCC as a work priority and believed they had the necessary time and skills to provide these services. Majority of this group believed that most pregnancies are unintended, and PCC is not merely to do with midwives, and the results of the present study are in agreement with a study by tough et al [23]. Present study's results showed that majority of the family health staff and midwives had a good knowledge about PCC. Results of a study by Bernstein et al. in 2000 showed that most midwives had little knowledge in this area [15]. The difference in results of these studies could be attributed to the time interval between studies on a new health issue.

Most family health staff and midwives had knowledge about the effect, commencement time and dosage of folic acid, while majority had rarely spoken to their patients about folic acid use, or prescribed it. Most of these two groups did not know of the cases of doubling of folic acid dosage. In a study by Abdolahi, only 23.9% of health staff knew the right time of prescribing folic acid during pregnancy [14]. A study by Hauser et al (2004) showed that knowledge and practice of staff about folic acid has an important role in preventing incidence of neural tube defect [26].

All family health team and midwives believed that PCC has an important effect on pregnancy outcome in women of reproductive age, and more half of the subjects considered it as an important work priority. In this area, results of a study by Van Heesch et al. (2006) agree with those of the present study [13] In the present study, the highest practices of family health staff were in the areas of medication use consultation, chronic diseases, and Pap-smear, and in addition to the above cases, midwives also had a good practice in care of STDs. A study by Heyes et al. (2004) showed

that most staff knew importance of PCC, and had dealt with this subject less than 5 times in the previous 3 months. General practitioners and nurses had been more involved with this issue and believed that advice about smoking, medication use, folic acid, genetic consultation, chronic diseases, alcohol, maternal care, and screening for rubella, STD, hepatitis, HIV, and Pap-smear are extremely important. They argued that PCC should be extensively implemented in health centers, and that they had adequate skills to perform this [27]. Most healthcare social workers had moderate knowledge, positive attitude, and moderate practice in relation to PCC. Given lack of similar studies in foreign countries and in Iran, interpretation and comparison of results about healthcare social workers were not possible. Results of the present study showed that level of knowledge in PCC among family health bachelors science was more than other groups. Also, technicians and healthcare social workers' practice in the area of PCC was more than that of physicians and bachelors of Science family health. Study subjects with shorter work experience had more positive attitudes and better practice and more knowledge of PCC compared to more experienced people. Young people had more positive attitude toward pre-conception care compared to older staff. This could have been due to teaching the new subject of PCC to fresh university graduates. In Abdolahi's study, no significant correlation was found between level of knowledge and work experience y, gender, folic acid consultation level and level of knowledge but awareness about some of the questions reduced with increasing work experience. Health staff that were aware of folat shortage in at-risk people and had knowledge of folic acid preventative properties from fetus neural tube defects, conducted more consultations with women during pregnancy and reproduction and assessed their folic acid use [14]. Due to the lack of similar study in Iran and because of the novelty of the subject, discussion and comparison were conducted with results of studies in other countries.

Conclusion

Generally, results obtained in the present study are not very satisfactory. Thus, planning for better education of staff, preparation for applicability of information, and also increased sensitivity of staff and others involved in providing obstetrics and health services in relation to PCC appear necessary. Additionally, staff is required to take part in educational programs using other resources, modify and upgrade their scientific and practical information in this area, so that they can provide better services. It is also necessary that public media, especially the national radio and television, have PCC education and consider its implementation and enhancing knowledge of families about PCC as part of their educational programs.

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Contributions

Study design: RB

Data collection and analysis: MRF, BN, ME

Manuscript preparation: HE, RB

Conflict of interest

"The authors declare that they have no competing interests."

References

- 1- Lu MC, Halfon N. Racial and ethnic disparities in birth outcomes: a life-course perspective. *Matern Child Health J*2003;7(1):13- 30.
- 2- Johnson K, Posner SF, Biermann J, et al. Recommendations to improve preconception health and health care—united states. *MMWR Recomm Rep*2006; 55(4).
- 3- Center WM. Maternal mortality 2012 [cited 2012]. Available at URL: <http://www.who.int/mediacentre/factsheets/fs348/en/index.html>.
- 4- Priorities for safe motherhood 2010 [cited 2012]. Available at URL: <http://www.who.int/mediacentre/factsheets/fs348/en/index.html>.

<http://www.safemotherhood.org/priorities/index.html>. 2012.

- 5- Sedgh G, Bankole A, Oye-Adeniran B, Adewole IF, Singh S, Hussain R. Unwanted pregnancy and associated factors among nigerian women. *Int Fam Plan Perspect*2006; 175- 84.
- 6- Ibisomi LD, Odimegwu CO. Predictors of unintended pregnancy among South African youth. *Eastern Africa Social Science Research Review*2007; 23(1): 61- 80.
- 7- Zamani F, Rajabi Z. Unwanted pregnancy in rural women of Najafabad. *Feyz Journals of Kashan University of Medical Sciences*2012; 5(2):12. [In Persian]
- 8- Centre M. 15 Million babies born too soon 2012 [cited 2012 109/]. Available URL: http://www.who.int/mediacentre/news/releases/2012/preterm_20120502/en/. 2012.
- 9- I.R.Iran CP. Health status indicators 2005 [cited 2012 108/]. Available at URL: http://www.whoiran.org/Country_Profile_Iran_EN.htm. [In Persian]
- 10- Korenbrot CC, Steinberg A, Bender C, Newberry S. Preconception care: a systematic review. *Matern Child Health J*2002; 6(2): 75- 88.
- 11- Preconception health and care 2006 [cited 2012 911/]. Available URL: <http://publichealth.lacounty.gov/mch/ReproductiveHealth/PreconceptionHealth/PCHFiles/CDC>.
- 12- Riskin Mashiah S, Auslander R. Preconception care-when and what: the attitude of Israeli gynaecologists to preconception counseling. *Arch Gynecol Obstet*2007; 275(5): 367- 71.
- 13- Van Heesch PN, Weerd S, Kotey S, Steegers EA. Dutch community midwives' views on preconception care. *Midwifery*2006; 22(2):120 -4.
- 14- Abdollahi F. Knowledge and practice of health workers about mode of administration Folic acid in women of reproductive age, in mazandaran province. *Journal of Mazandaran University of Medical Sciences*2004; 15(49): 85- 9. [In Persian]

- 15- Bernstein P, Sanghvi T, Merkatz I. Improving preconception care. *J Reprod Med*2000;45(7):546- 52.
- 16- Aggarwal A, Kumhar GD, Harit D, Faridi M. Role of folic acid supplementation in prevention of neural tube defects: physicians yet unaware. *J Prev Med Hyg*2010; 3(51): 51.
- 17- Abu-Hammad T, Dreihier J, Vardy DA, Cohen AD. Physician's knowledge and attitudes regarding periconceptual folic acid supplementation: a survey in Southern Israel. *Medical science monitor: international medical journal of experimental and clinical research*2008; 14(5): 262 -7.
- 18- McGrail A. We want to get pregnant. When should I stop taking the pill? 2013 [cited 2013 12/]. Available at URL: <http://www.babycentre.co.uk/x7095/we-want-to-get-pregnant-when-should-i-stop-taking-the-pill>.
- 19- Boggess KA, Edelstein BL. Oral health in women during preconception and pregnancy: implications for birth outcomes and infant oral health. *Maternal and child health journal*2006; 10(1): 169- 74.
- 20- Al Habashneh R, Aljundi S, Alwaeli H. Survey of medical doctors' attitudes and knowledge of the association between oral health and pregnancy outcomes. *Int J Dent Hyg*2008; 6(3): 214- 20.
- 21- Bahri N, Iliati HR, Bahri N, Sajjadi M, Boloochi T. Effects of oral and dental health education program on knowledge, attitude and short-time practice of pregnant women (Mashhad-Iran). *J Mash Dent Sch*2012; 36(1): 1- 12. [In Persian]
- 22- Dadras E, Ahmadi Z, Danesh Kajouri M, Agha HF. Relationship between pre-pregnancy body mass index and childbirth outcomes in primiparous women. *Iran journal of nursing (IJN)*2010; 22(62): 56- 64. [In Persian]
- 23- Tough SC, Clarke M, Hicks M, Cook J. Preconception practices among family physicians and obstetrician-gynaecologists: results from a national survey. *JOGC*2006; 28(9): 780.
- 24- Brand T, Van Haperen V, van Vliet-Lachotzki E, Steegers E. [Preconceptual care should include looking at the effect of working conditions on pregnancy]. *Ned Tijdschr Geneesk*2008; 153: A363.
- 25- Wallace M, Hurwitz B. Preconception care: who needs it, who wants it, and how should it be provided? *Br J Gen Pract*1998; 48(427): 963.
- 26- Hauser KW, Lilly CM, Frías JL. Florida health care provider's knowledge of folic acid for the prevention of neural tube defects. *Southern medical journal*2004; 97(5): 437 -9.
- 27- Heyes T, Long S, Mathers N. Preconception care practice and beliefs of primary care workers. *Family Practice*2004; 21(1):22- 7.