

## Technical Quality of Maternity Care: the Pregnant Women's Perspective

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ARTICLE INFO	ABSTRACT
<p><b>Article type:</b> <i>Original Article</i></p>	<p><b>Background:</b> Improving adherence to care standards is one way to improve quality of delivered care. This study aimed to determine the degree of providers' adherence to maternity care standards from the perspective of pregnant women.</p>
<p><b>Article history:</b> <i>Received: Dec 10 2012</i> <i>Accepted: March 18 2013</i> <i>e-published: Jun 30 2013</i></p>	<p><b>Methods:</b> This cross-sectional study was conducted on 185 pregnant women in their ninth month of pregnancy who received maternity care from health centres in Tabriz, Iran. Participants were selected randomly from 40 health centres. Data collection used a researcher-developed questionnaire based on Iranian Ministry of Health (MOH) standards for maternity care. Questionnaire validity was reviewed and confirmed by 10 experts.</p>
<p><b>Keywords:</b> <i>Technical quality,</i> <i>Adherence to standards,</i> <i>Maternity care,</i> <i>Quality improvement</i></p>	<p><b>Results:</b> About 69% of pregnant mothers during their 9-month pregnancy received at least six items of standard maternity care. Almost two-thirds of participants received recommended maternity care at or above minimal standards for some aspect, such as the number of care during pregnancy, referral to health centre physician, and weight and blood pressure measurement. Some other services such as measuring uterus height, review for oedema and varicosities, referral to a dentist, listening for fetal heart sound and vaginal examination, were reported at very low adherence to the Ministry of Health guidelines</p>
<p><b>*Corresponding Author:</b> <i>Jafar S. Tabrizi</i> <i>Tel: +98 411 3355952;</i> <i>e-mail: tabrizijs@tbzmed.ac.ir</i></p>	<p><b>Conclusion:</b> A notable proportion of pregnant mothers reported receiving suboptimal care indicating significant room for improving the quality of maternity care based on Iranian MOH standards and guidelines. The results indicate potential benefits from interventions to improve health care providers training and the awareness of pregnant women about the standards for good maternity care.</p>

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### Introduction

Globally population health is improved by improving the well-being of pregnant women and newborns. Therefore, improving maternal health and reducing maternal mortality are the major aims of governments<sup>1</sup>. According to WHO, about 98% of the estimated

529 000 maternal deaths and 5.7 million pre-natal deaths occur in developing countries each year. In some countries, a pregnant woman is more than 140 times at risk of dying because of pregnancy problems compared with a woman in a developed country<sup>2</sup>.

The Millennium Declaration, approved by 189 countries in 2000, has eight Millennium Development Goals (MDGs) to be achieved by 2015. The 5<sup>th</sup> MDG is focused on improving maternal health<sup>3</sup>. The maternal mortality ratio (MMR), which is an indicator of the risk of death associated with pregnancy, decreased from 237 per 100 000 live births in 1973 to 24.7 in 2007 in Islamic Republic of Iran<sup>4</sup>. Maternity care is defined as all care in relation to pregnancy, childbirth and the postpartum period. The Iranian Ministry of Health (MOH) developed an evidence-based maternity care guidance to enhance public maternity care by promoting high quality birthing services to facilitate optimal outcomes in mothers and newborns. Several programs are currently underway to ensure health services are well placed to meet the needs of the pregnant women in rural and urban areas and to offer women access to care that is based on evidence and best practice<sup>5</sup>. The significant reduction in MMR in Iran shows that health system programs can improve maternal outcomes but there remains a need to continuously maintain and improve quality of delivered care.

Quality of care can be seen as having three principal components, Service, Customer and Technical quality<sup>6</sup>. *Service Quality* (SQ) refers to the non-health aspects of care and reflects the experience of the health care customers with the health system. *Customer Quality* refers to the characteristics that customers need for effective involvement in health care processes, decision making and action to improve the quality of care delivered and received<sup>7</sup>. *Technical Quality* is what the customers receive relative to what is known to be effective and largely reflects issues related to the health care providers knowledge and experiences<sup>8</sup>.

It is widely accepted that improving maternity care standards (technical quality) improves health outcomes<sup>9-11</sup>. Technical quality can be measured in several ways. Evaluation of medical records and using health care pro-

viders' perception of care have been the most popular methods for assessing the quality of care and there has been little attention on patients' perspective<sup>12</sup>. Medical records can be an imperfect data source on quality of care mostly due to the percentage of missing data (20-70%) or reporting without service delivery<sup>13</sup>. While evidence suggests that customers' perspective about delivered care could be a valuable and inexpensive way to assess the quality of care<sup>14</sup> and also make it more accountable<sup>15</sup>, use of customer reports maybe inaccurate and subject to recall bias.

To improve the quality of maternity services provided by the public health network, it is essential that health centers, health posts and policy makers understand what pregnant women think about their maternity care and treatment. Thus, this study aimed to determine the technical quality of maternity care based on the degree of adherence to MOH maternity care protocols from the perspective of pregnant women in Tabriz-Iran.

## Materials and Methods

This cross-sectional study was conducted among pregnant women who were in the ninth month of pregnancy in 2011. The study design and procedure were previously approved by the Ethics Committee of Tabriz University of Medical Sciences. The study sample was randomly selected from pregnant women's registration lists from 40 health centres and health posts in Tabriz urban areas. Eligible participants were pregnant women at near term (nine-month) stage who had received at least three episodes of pregnancy care and lived in Tabriz. Of 215 contacted pregnant women, 185 participants responded to the study questionnaire (86%). Of 30 non-responding participants, 19 were excluded because of inability to answer the questionnaires (63.3%) and 11 people did not complete the consent forms (36.7%).

Study questionnaires obtained demographic information including age, education

level, care provider, pregnancy history, health insurance; self-reported perception of maternity care services received in relation to recommended maternity care standards. For the major maternity care standards, participants were asked about their around nine mounts experiences of maternity care services provided by public health network in Iran.

Recommended frequency of maternity care was defined as items of recommended care based on protocols issued from Iranian MOH<sup>5</sup>. These were considered process measures of technical quality. Participants were asked to report the frequency of receiving this care for each factor (Table 1) over the pregnancy period. Self-reports of service frequency were then compared to the recommended standard frequency to define sub-optimal care. Rate of self-reported maternity care (poor or well controlled) was then compared between those who did and did not meet the minimum standard for maternity care service frequency.

The association between explanatory variables and adherence indicators were assessed by Chi squared tests. Multivariate analyses were conducted using ANOVA in the SPSS statistical software, version 15.0 to estimate association between adherence indicators and outcome variable (maternity care status). The level of statistical significance was set at *P* value less than 0.05.

## Results

Study participants were mostly aged between 20-29 years old (70%) and almost half (47%) had achieved elementary and secondary school education level. The majority of participants (69%) received maternity care from the urban health centres. More than half (56%) were experiencing pregnancy for the first time and for 58% it was a planned pregnancy. In 26% of cases, care was under the control of specialists and 79% had care from the same provider throughout pregnancy. Only 32% of participants received care at the recommended standard level. There was no significant relation-

ship between demographic factors and maternity care standards and TQ score (Table 2)

**Table 1:** Recommended care and its frequency based on Iranian Ministry of Health maternity care protocols

Recommended Maternity Care	Frequency <sup>1</sup>
<b>Clinical examination</b>	
Care services	6
General practitioner visits	1-3
Dentists visits	1-3
Obstetric examination	2
Blood pressure measurement	6
Body weight measurement	6
Fetal heart check	5
Fundal hight measurement	6
Feet exam to assess oedema	6
Vaginal bleeding assessment	6
High risk pregnancy assessment	6
<b>Received education in pregnancy</b>	
High risk pregnancy	6
Nutrition and supplements	6
Individual hygiene	6
Breast feeding	3
Oral health	3
<b>Received supplements</b>	
Ferrous sulfate (Iron)	5
Multivitamins	5
Folic acid	4
<b>Para clinic examinations</b>	
Blood tests	2
Urine tests	2
Ultrasound examination	2-3

1.Frequency during nine months of care <sup>5</sup>

Recommended care for pregnant women and received care as reported by the participants for the past 9 months of pregnancy are presented in Table 3. Most participants reported maternity care satisfying minimum (69%) standards, but 31% did not report having recommended care during 9 months of pregnancy. About half reported receiving dental care, 19% reported obstetric examination at the minimum standard frequency and 69% received blood pressure measurement at the recommended frequency. For checking feet to

**Table 2:** Self-reported characteristics of study participants

Characteristics	No	%	
Age (yr)	< 20	18	10
	20-30	128	70
	≥ 30	37	20
Education level	Elementary and secondary	87	47
	High school	85	46
	Tertiary	13	7
Place of received care	Urban health centre	128	69
	Health post	57	31
Pregnancy history	One	103	56
	Two	47	26
	Three or more	34	18
Planned pregnancy	Yes	108	58
	No	77	42
Seeing obstetrician		125	68
Having health insurance		160	87
Having continuity of care <sup>1</sup>		182	98.4
Effective maternity care <sup>2</sup>	Poor and weak	23	12.4
	Good and excellent	162	87.6

1: Seeing the same care provider for maternity care during pregnancy

2: Having overall effective maternity care during pregnancy period

assess oedema and fundal height measurement about 9% reported meeting the minimum standard frequency and over 90% of participants achieved less than standard recommended care. Having been tested for fetal heart, vaginal bleeding and high-risk pregnancy satisfied 21, 28 and 15% of minimum standard level respectively. Providing education about pregnancy was dramatically less than minimum standard level.

Almost one-third reported receiving pregnancy supplements (iron, vitamins and folic acid) at the minimum standard level but 72% of participants received folic acid less than recommended level. For blood examination, only 23% met the minimum level and 66% reported less than standard level. From the participants' reports, about 85% met recommended standard of ultrasound examination. Only 20% reported receiving urine analysis at the standard level with over two-third reporting less than recommended care.

There was a significant positive relationship between education attainment and the number of care services ( $P=0.003$ ) and a negative relationship between place of received care and number of care services.

This means that participants who received their care from urban health centres were more likely to have standard care than those attending health posts ( $P=0.035$ ). Women experiencing their first pregnancy and those aged under 30 years old reported more ultrasound examinations than those who had two or more pregnancy and those 30 years or older ( $P=0.005$ ). Insured women were also more likely to report ultrasound examinations than uninsured people ( $P=0.019$ ).

Participants who assessed their overall quality of received care as good and excellent also reported higher adherence to the maternity care standards ( $P=0.003$ ) compared to mothers who did not. Participant who registered in the first trimester also reported higher technical quality score than others (0.34 vs. 0.27;  $P=0.001$ ).

## Discussion

The key finding of this study is that, based on women's reports of care during pregnancy, adherence to MOH recommended protocol for maternity care was relatively high for some clinical examination and low for

**Table 3:** Received maternity care over the past 9 months of pregnancy

Maternity care	Receiving care (mean)	Meeting % <sup>1</sup>		
		Less than standard No. (%)	At the standard level No. (%)	More than standard No. (%)
<b>Clinical examination</b>				
Care services	6.02	58 (31.4)	127 (68.6)	---
General practitioner visits	2.26	20 (10.8)	129 (69.7)	36 (19.5)
Dentists visits	0.53	87 (47)	98 (53)	---
Obstetric examination	0.59	144 (77.8)	35 (18.9)	6 (3.2)
Blood pressure measurement	6.02	58 (30.8)	127 (68.6)	---
Body weight measurement	6.02	58 (30.8)	127 (68.6)	---
Fetal heart check	4.22	78 (42.2)	39 (21.1)	68 (36.8)
Fundal hight measurement	1.24	168 (90.8)	17 (9.2)	---
Feet exam to assess oedema	1.14	169 (91.4)	16 (8.6)	---
Vaginal bleeding assessment	3.08	112 (72.3)	43 (27.7)	---
High risk pregnancy assessment	2.01	156 (84.8)	28 (15.2)	---
<b>Received education in pregnancy</b>				
High risk pregnancy	2.31	126 (81.8)	28 (18.2)	---
Nutrition and supplements	2.21	149 (80.5)	36 (19.5)	---
Individual hygiene	3.23	134 (72.4)	51 (27.6)	---
Breast feeding	0.59	147 (94.8)	8(5.2)	---
Oral health	1.33	154 (84.2)	31 (15.8)	---
<b>Received supplements</b>				
Ferrous sulfate (Iron)	4.83	44 (19.5)	58 (31.4)	83 (44.9)
Multivitamins	4.79	45 (24.4)	57 (30.8)	83 (44.9)
Folic acid	2.38	130 (72.3)	34 (18.9)	16 (8.9)
<b>Para-clinic examinations</b>				
Blood tests	1.46	122 (65.9)	42 (22.7)	21 (11.4)
Urine tests	1.24	140 (75.7)	37 (20)	8 (4.3)
Ultrasound examination	2.93	12 (6.5)	115 (84.6)	16 (8.9)

1. Percent of pregnant women meeting recommended care from Iranian Ministry of Health protocols

education, supplements and Para-clinic examinations.

Although the field of pregnancy and childbirth pioneered evidence-based practice, resulting in a wealth of clear guidance for evidence-based maternity care, there remains a widespread and continuing underuse of beneficial practices, overuse of harmful or ineffective practices, and uncertainty about effects of inadequately assessed practices. The 1999 Iranian MOH document “Maternity Care Services”<sup>5</sup> is widely disseminated in the rural and urban health centres and advocated as a protocol to care for pregnant women. It would be expected that the rates at which minimum

recommended frequency of care, as defined by such protocol, is received should be a reasonable indicator of the overall quality of maternity care provided by the health system. In this study, we have used pregnant women’s reports of frequency of care activities rather than health care providers’ reports or service records. Providing good quality maternity care has four fundamental factors: clinical examinations, education, providing supplements and Para-clinic examinations. First of all a careful clinical examination is needed to enabling childbearing women to be as healthy as possible and to be sure that all potential problems are detected. This study results indicated that, approximately 70% of pregnant women re-

ported receiving this care at least 6 times during pregnancy (the standard level). In Brazil a study demonstrated an increase in the number of women who had at least six visits during pregnancy from 5.7% in 2001 to 62.7% in 2006 with a project to improve care by encouraging and empowering pregnant women to use maternity services<sup>16</sup>. This study suggests a higher level of maternity care has already been achieved in the East Azerbaijan of Iran primary health care system but there is still room for considerable improvement. According to the Brazilian study findings, measurement of blood pressure and body weight control during pregnancy were similar to our study. Khosravi and colleagues found that in Iran, 54% of mothers were weighed less than the recommended standard, 32% at the standard and 14% more than recommended standard<sup>16</sup>. Bakhshian and colleagues found that blood pressure was measured in penultimate and final pregnancy 7.6 and 8 times respectively, more than MOH recommended standards<sup>17</sup>. Patient education during pregnancy and maternity care about matters such as high risk pregnancy, nutrition and breast feeding is highly valued by pregnant women<sup>18</sup>. Our study findings indicate that prenatal education has been largely neglected. There is a need to improve patient education and patient-clinician communication during pregnancy.

Nutrition and nutritional supplements have a vital role in a comprehensive maternity care. A study in Mexico showed the benefits of supplements during pregnancy such as improvements in maternal nutritional status, maternal and child micronutrient status, and child growth and development<sup>19</sup>. In this study pregnant woman, reported sub-optimal use of vitamin and mineral supplements compared to the recommended standard. Given the crucial role of folic acid to prevent anaemia in the mother and infant neurological disorders<sup>20</sup>, mothers reported low adherence to standards (72%). The variation from recommended standard was even worse for iron and multi-

vitamin supplements. This problem appears to be widespread. For example, Kohan and colleague found that around 50% of mothers had recommended consumption of iron during pregnancy and just 43% had adequate folic acid consumption during the first trimester of pregnancy<sup>21</sup>. Navydiyan also reported that only 53% of mothers received iron tablets during pregnancy in Zahedan<sup>22</sup>. Although this might be a national problem in Iran, our results indicate the need for immediate attention in Tabriz to this part of prenatal care.

Hejazi in 1998 found that 71% of pregnant women had been tested fully, 16% had incomplete and 12% of them did not receive pregnancy test<sup>23</sup>. Moreover, a study in Semnan, Iran indicated that blood and urine tests were performed at recommended standard levels for 72% of pregnant women only<sup>24</sup>. However, our study's results showed that blood and urine testing was reported at below standard for 66% and 76% of participants, respectively. Therefore, there is clearly still significant room for improvement.

It is reassuring that 62% reported having ultrasound examination at the recommended level, while around one-third of participants reported receiving ultrasound examination more than standard level (overuse). Private sector specialists prescribed the majority of ultrasounds. Bashour and colleagues (2005) found that Syrian woman accessed ultrasound on average 5.5 times during pregnancy<sup>25</sup>. However, while ultrasound examination is usually viewed as harmless, there are reasons to be concerned about its overuse. According to the WHO and U.S. Department of Health and Human Services report, it is not clear whether ultrasound monitoring is helpful to the pregnant mother or fetus in terms of pregnancy outcome<sup>26</sup>. If there is proven benefit to the monitoring, there is little reason to expose pregnant mothers and fetus to any potential medical risk and cost. Torloni and colleagues (2009) in a systematic review found that exposure to ultrasound appeared to be safe for pregnant women and fetus<sup>27</sup>, but oth-

er studies in humans showed an association between in utero insonation of fetuses and delayed speech, dyslexia and non-right handedness<sup>28</sup>. Moreover, a study of over 1400 women in Australia, comparing pregnant mothers who had ultrasound only once during pregnancy with mothers who had five monthly ultrasounds found significantly higher intrauterine growth restriction in the intensive ultrasound group. These mothers gave birth to lower weight babies<sup>29</sup>. Therefore, care providers should take a prudent approach and caution women against over use of ultrasound.

Finally, this study found that later registration to maternity care program was related to poorer quality of maternity care. Given the well-documented relationship between late presentation for antenatal care and poorer pregnancy outcomes, promoting earlier enrollment must be a high priority for the health care system. The major advantage of using participant-based reports is that it is amenable to large surveys independent of the practitioner and practice setting. Most clinical audits are based on either clinician surveys, medical record audits or information available in routinely collected, usually administrative, datasets. Clinician or care provider surveys are dependent on the willingness and interest of them in participating and most surveys report very low participation rates. Medical audits are resource intensive and dependent on the quality of information recorded which could be highly variable. In the absence of a universal electronic health records, large administrative sets are currently very limited in the information available on a population wide basis.

## **Conclusion**

The findings of the present study from the pregnant women's perception suggest that there are considerable opportunities to improve maternity care compared to the Iranian MOH standards, particularly for providing supplements and education in pregnancy. There is well-documented approaches that can im-

prove this. It is believed that this customer based information could be a useful picture of maternity care quality delivered in the public health sector by the overall primary health care system.

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## **Competing interests**

The authors declare that there is no conflict of interests.

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