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An evaluation of the quality of care for women with low risk pregnancy: The use of evidence-based practice during labour and childbirth in four public hospitals in Tehran

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ABSTRACT

Objective: there is a consensus that the adoption of evidence-based practice contributes to the improvement of maternity care. Iranian National Guidelines for Normal Childbirth included evidence-based practice and were disseminated to hospitals in 2006 but little is known about the success of implementation. This study investigates the provision of care during labour and childbirth in comparison with national guidelines in four public hospitals in Tehran.

Design: this was a descriptive evaluation study and investigated the provision of care during labour and childbirth using current evidence-based practice as the indicator of quality.

Participants and setting: the observational and interview data were collected using checklist and interview guide based upon standards for evidence-based care in four public hospitals in Tehran. In 24 women who were admitted in normal labour, practices were observed until the end of the third stage of labour, to determine concordance with Iranian National Guidelines for Normal Childbirth. A further 100 postpartum woman were interviewed about their care during labour and childbirth in the early postpartum period before discharge from the postnatal ward.

Findings: beneficial and lifesaving practices such as assessing mothers' well-being; removal of the placenta in the third stage of labour, as well as skin-to-skin contact and early initiating of breast feeding were recorded in most cases. However, the use of practices such as routine augmentation and induction of labour, fundal pressure, conducting routine episiotomy were noted.

Key conclusions: this evaluation study shows good practice and areas for improvement as practices fail to meet evidence based standards. Thus, there is potential for quality improvement and economic savings in Tehran maternity hospitals. However closing the gap between guidelines based on best evidence and actual clinical practice in childbirth is a challenge. Practical solutions to enable implementation of evidence-based guidelines for normal childbirth in low risk women require further studies, especially from the providers' perspective.

Implications for practice: national programs which focus on organisational framework, interventions to change provider's attitudes towards the development of a culture of birth as a normal and physiological process are more likely to be important in the Iranian context. Involving professional midwives more in the care for normal childbirth may help to improve quality of care during normal labour and childbirth in terms of evidence-based practice.

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Introduction

Achieving quality of care during labour and childbirth is one of the most challenging aspects of the Fifth Millennium Development Goal (5MDG) (WHO, 2005). For many years quality improvements in developing countries have focused on increasing access to skilled

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birth attendants for all deliveries, expansion of facilities as well as access to emergency obstetric care (Langer et al., 1998; Freedman et al., 2007). However, the quality of care for low risk women (70–80% of women) has been neglected and consequently too many women have been treated as high risk cases unnecessarily (WHO, 1996).

There is a consensus that to improve the quality of maternal care during childbirth, the provision of clinical care should be based on the best evidence available (Belizan et al., 2005; Waldenström, 2007). WHO recommends implementation of evidence-based practice within guidelines and policies for labour and childbirth classifying practices as beneficial, ineffective, harmful or doubtful (WHO, 1996). Systematic reviews are encouraged and disseminated through the Reproductive Health Library (RHL, 2014).

In Iran, around one million women give birth in a year of which 96% take place in health facilities (MOHME, 2004). The trends in relation to access to maternity services and skilled birth attendants during childbirth have been favourable and the country has recently reached the 5MDG's target of 75% reduction in maternal mortality (UNFPA, 2012). However in the past four decades, there has been a sharp increase in the Caesarean Section (CS) rate. It was 3% in a maternity hospital in Tehran (Farhud et al., 1986). A report from public hospitals in Iran shows a continuous increase in the proportion of CS out of all deliveries between 1979 and 2009 (Badakhsh et al., 2012). A recent study reports CS rates of 38%, 45% and 48% in Iran and 53%, 60% and 74% in Tehran (capital city) for the years 2005, 2007 and 2009 (Bahadori et al., 2013).

The Ministry of Health and Medical Education (MOHME) and the Social Security Organisation (SSO) provide maternity care in public teaching and non-teaching hospitals. The hospitals run by the MOHME are supervised by medical universities and include teaching and a few non-teaching hospitals. These public hospitals provide free or subsidised low rate health care for women from low and middle income families. Additionally health insurance companies such as Medical Services Insurance Organization (MSIO), Social Security Organization (SSO) and a number of other organisations cover health care costs for their employees (WHO, 2006b). All obstetricians are women in public hospitals. Iranian midwives are university graduates, however, their role in maternity services is limited to being involved in care for normal childbirth in SSO as well as a few non-teaching public hospitals run by MOHME where the obstetricians are the lead caregivers and are responsible for all births. In teaching hospitals where obstetrics residents are trained, they manage all vaginal deliveries to gain experience and midwives are less involved in care for normal childbirth.

The MOHME in Iran has included EBP in guidelines which have been disseminated to all hospitals in order to improve the quality of care during normal labour and childbirth (MOHME, 2006). Therefore these guidelines can be used as a tool for assessing the quality of maternity care (Colomar et al., 2004; Garner et al., 2004). There have been some efforts to evaluate quality of maternity care in Iran using Donabedian's framework (Aghlmand et al., 2008; Simbar et al., 2009; Moosavisadat et al., 2011). This paper forms part of a larger mixed methods study which used Hulton et al.'s (2000) framework for exploring quality of care during labour and childbirth (Pazandeh, 2014). Hulton et al.'s (2000) framework stresses that quality of care should be consistent with current professional knowledge (Hulton et al., 2000). This paper aimed to investigate the provision of care during labour and childbirth in comparison with national guidelines in four public hospitals in Tehran.

Methods

Study site, population and sampling

The provision of care during labour and childbirth was investigated in two studies (one observational, one interview-based) in

four public hospitals (two teaching and two non-teaching, one of MOHME and one managed by SSO) between October, 2011 and April, 2012.

Participants for the observational study were women with full-term pregnancy whose labour started spontaneously and delivered a healthy infant by normal vaginal childbirth. Thirty five non-participant observations were conducted of which 24 were completed and used for the analysis. The others were not used because four women were taken to CS because of insufficient progress of labour or irregular Fetal Heart Rate (FHR); one woman was taken to the operation room because of retained placenta; six women delivered during night shifts and the observation records were incomplete.

Participants in the interviews were women seen early post partum who were healthy and delivered a full term, singleton and healthy infant by vaginal childbirth without complication. A convenience sampling approach was used and the number of women required for interviews at each hospital was calculated according to the proportion of normal deliveries in each hospital (quota sampling). In hospitals A, B, C and D, 24, 35, 18, 23 women were recruited respectively. Hospital A and D were teaching hospitals and hospital B and C were non-teaching hospitals. Five per cent of women refused to take part in the interview because of tiredness, their infant was crying or they were discharged and wanted to leave the ward. Overall, 106 participants were recruited; of these 100 interviews were used; six interviews were excluded because four were incomplete (women were discharged and wanted to leave the ward), one woman's third stage of labour had taken longer, one woman's baby was not well at the time of childbirth.

Observation and interviews

The observational data were collected using a checklist and the interview based upon standards for evidence-based care using WHO guidelines for normal childbirth (WHO, 1996) and Iranian National Guidelines for Normal Childbirth (MOHME, 2006). The selected beneficial practices were: assessment of the well-being of the woman and baby during labour, monitoring practices to check the progress of labour, freedom to drink oral fluid, to eat light diet, freedom to walk during labour, freedom of position during labour and childbirth, early skin-to-skin contact between mother and child and Active Management of Third Stage of Labor (AMTSL) and early initiation of breast feeding. The harmful and doubtful practices included routine use of enema, routine use of pubic shaving, routine intravenous infusion, early amniotomy, routine Oxytocin augmentation, fundal pressure, routine episiotomy, and routine manual exploration of the uterus after childbirth.

The data about actual care were recorded using observations of routine care during labour and childbirth. The structured observation checklist comprised the options: 'Yes', 'No' or 'Not applicable'. The observation checklist was piloted by two observations which were conducted with a research assistant to make sure the research was feasible and well observed.

The interview schedule consisted of closed questions and collected data on demography, routine practices in admission, labour and postpartum wards which could not be recorded during the observational study. To obtain content validity, firstly, all the constructed tools were reviewed by six experts in the UK and Iran.

Organisation of the data collection

The selected routine care and practices which were performed during labour and childbirth were observed until the end of the third stage of labour and the observation ended with the transfer to the postpartum ward. Participants were recruited consecutively

within two weeks at each hospital. All of the observations were conducted during both day and evening shifts on working days and weekends. The postpartum women were recruited and interviewed in the postpartum ward which took around 15–20 minutes.

Ethical considerations

Ethical approval was gained from ShahidBeheshti University of Medical Sciences in Tehran (approval number 92/260). Additionally permission to access hospitals was gained from ward managers. Women were informed about the research purpose, data confidentiality and participants' freedom to join or leave the interview. Women who agreed to participate, signed the consent form, were subsequently observed during labour and childbirth or interviewed postnatally.

Data analysis

All obtained data from observations and interviews were entered and validated in SPSS18 software. Descriptive statistics were computed to determine all variable distributions i.e. frequencies and percentages to describe the sample. As scores were not normally distributed, median scores for subgroups of interest were investigated using non-parametric tests (Kruskal-Wallis test).

Table 1
Characteristics of Women attended the Interviews in Four Public Hospitals, Tehran.

Characteristics	Total n=100 (%)
Age (Range)	16–36
Age group (Mode)	(25–29)
Mean age (SD)	26 (4.69)
Parity	
First-time mother	60%
Multipara	40%
Education	
Primary	14%
Secondary school	26%
High school graduate	49%
University degree	11%
Occupation	
Employee	2%
Self-employed	3%
Worker	1%
Housewife	93%
Student	1%
Home ownership	
Live in own home	%26
Rented	%56
Live in relatives home	%18

Table 2
The observed assessment of well-being of women and babies in four public hospitals, Tehran.

Practice	Practice observed	n/24
Monitoring progress of labour	Cervical dilatation, Descent of the fetal presenting part, FHR	22
	T, BP& P checked in admission to labour	24
Monitoring women's physical well-being	BP& P checked every one hour	6
	T, BP& P checked every four hours	5
Monitoring well-being of baby (First stage)	BP was checked in the end of third stage of labour	24
	FHR was checked & recorded every 15 minutes using EFM	19
	FHR was checked & recorded every 30 minutes using Doppler	5
	Contraction checked and recorded every 30 minutes	8
(Second stage)	FHR was checked and recorded after contractions	20

T: Temperature P: Pulse BP: Blood Pressure FHR: Fetal Heart Rate.

Findings

Characteristics of participants

The majority of women in the observation group were in the 25–29 year age group. The age range was 19–33 years and the mean age was 26 years (SD=4.22); 15 women were first time mothers and nine women were second time mothers.

The majority of the interview group of women (48%) were in the 25–29 years age group and the mean age of the overall sample was 26 years (SD=4.69) (range 16–36). 60% of women were first time mothers and 40% were multipara women (33% were second time mothers). Around half of the women (49%) were high school graduates; 93% were housewives and 56% lived in a rented house (Table 1).

Admission

According to the results of observations, 18 out of 24 of women were admitted in active phase (cervical dilatation ≥ 4 cm). Six women were admitted in early labour. Of the 100 women attended interviews, more than half (67%) reported that they were admitted when their labour pain had started. 33% of women were admitted because the 'Estimated Date of Delivery (EDD) was close' and elective induction was scheduled or they were admitted during antenatal check-ups.

Assessment of women and babies well-being and progress of labour

Table 2 shows the assessment of the well-being of women and babies in the observational study, during labour and childbirth in the study hospitals. A partogram was not used in these hospitals but the components of partogram such as cervical dilatation, descent of the fetal presenting part and FHR were recorded in detail in women's record in 22 cases.

The women's temperature, blood pressure and pulse were checked on admission and the blood pressure was checked again at the end of the third stage of labour in all observed women. During labour these vital signs were only recorded in eleven cases. During the first stage of labour FHR was regularly checked and recorded in all cases and in second stage after contractions in 20 cases.

Routine care and interventions during labour and childbirth

According to data from observations, none of the women were allowed to eat but 14 women were allowed to have some water during labour. Women were not free to choose their position and all women were in left lateral position or lying down in their bed during labour. Seven out of 24 women were allowed to walk sometimes. All women were moved to the delivery room at the

time of childbirth and were delivered lying on their backs with their legs supported in stirrups (lithotomy position).

The results of observations showed that 20 out of 24 women underwent amniotomy in the first stage of labour. Labour was augmented using Oxytocin in 18 observed cases. Fundal pressure was applied in more than half of cases ($n=16$). The results of observations showed that 19 women underwent episiotomies. Skin to skin contact was done in 20 of the observed cases but the procedure was too short (2–3 minutes).

Table 3 shows the observed practices for the management of third stage of labour. Oxytocin was not used routinely after delivery of baby and before removal of placenta. The cord was clamped around 30–60 s after delivery of baby in all cases; concurrent controlled cord traction was used in 10 cases and women's efforts were used to remove the placentas in 14 cases. The infusion of a solution containing 20 IU of Oxytocin was used after removal of placenta in all cases and placenta was observed and checked in 20 observed cases. The caregivers made sure that the uterus was contracted properly after removal of placenta in all cases.

Fig. 1 shows the frequency of interventions during labour and childbirth in women who were interviewed. Women did not receive pubic or perineal shaving in hospital, as they had done it at home. Of the 100 women, only 11% had received an enema on admission; 71% reported that their amniotic sac was ruptured artificially in the first stage of labour; 45% of women's labour was augmented and 33% were induced by Oxytocin infusion.

Also, 59% of women reported that their caregivers pushed the top of their tummy (abdomen) to help their baby come out; 76% of women underwent episiotomy of which 66% were primipara and 34% multipara women.

Of the 100 women, 49% were examined vaginally 6–10 times, 29% (1–5), 22% (> 10) times during first stage of labour and 48% were examined by 1–3 caregivers, 41% (4–6), 11% (7–9) caregivers respectively.

Table 3
The Observed Practices for Management of Third Stage of Labour in Four Public Hospitals, Tehran.

Practice	N/24
Cord clamping (30–60 s) after childbirth	24
Concurrent controlled cord traction	10
Oxytocin used after removal of placenta	24
Placenta examined after removal	20
Massage of uterus after removal of placenta	24

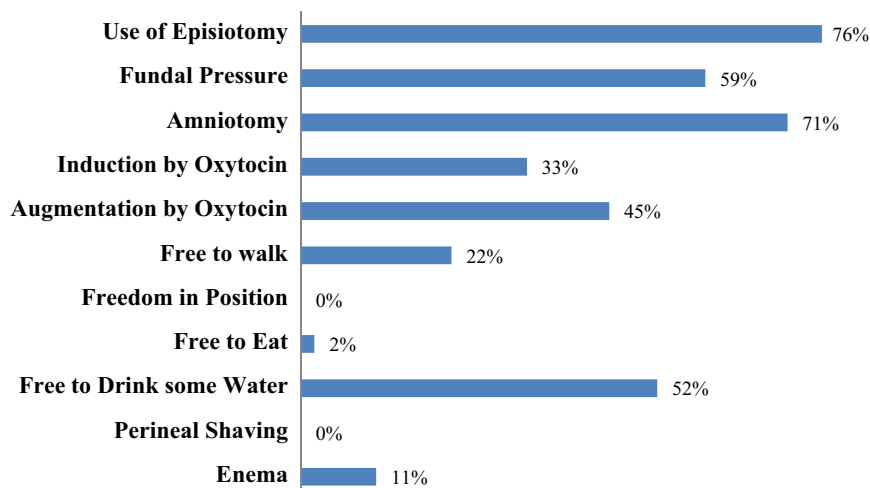


Fig. 1. The routine care and interventions during labour and childbirth according to interviewed women in four public hospitals, Tehran.

Of the 100 women, 82% reported that they had an opportunity to hug their infant for few minutes immediately after childbirth and 96% stated that they had been encouraged and started breast feeding their babies 1–3 hours after childbirth in the postpartum wards.

Place of birth and rate of interventions

The results from the Kruskal–Wallis test show significant differences in the median numbers of induction of labour among four groups of women ($p=0.0001$). Those who gave birth in hospital B were more often induced by Oxytocin. The results from the Kruskal–Wallis test also show significant differences in the median numbers of women who were allowed to walk during labour in the study hospitals ($p=0.0001$). The women who gave birth in hospital C had more opportunity to walk in labour.

The majority of women in hospital C (39%) were examined 1–5 times in labour compared to majority of women in hospitals A (54%), B (52%) and D (52%) who were examined (6–10) times in labour. However the results from the Kruskal–Wallis test show no significant differences in median numbers of vaginal examinations between the four groups of women. The results from the Kruskal–Wallis test show significant differences in the median numbers of caregivers who performed vaginal examinations in labour among the four groups of women ($p=0.041$). Those women who gave birth in hospital B and C were examined by fewer caregivers.

Discussion

The results of observation of actual practice and the interviews with women in early post partum showed that EBP during labour and childbirth is partially followed in Tehran public hospitals. The life-saving and beneficial practices for assessing mothers' well-being; removal of the placenta in the third stage of labour, as well as skin-to-skin contact and early initiating of breast feeding showed that Iranian maternity services are well ahead of many other countries in reducing maternal mortality as well as promoting breast feeding which has also been confirmed by this study (Zareai et al., 2007; Olang et al., 2009; UNFPA, 2012). However there were high rates of ineffective and harmful practices such as induction, augmentation, fundal pressure and episiotomy which were not in line with WHO (1996) and EBP Iranian guidelines for normal childbirth (MOHME, 2006). WHO has emphasised maternal and new-born health as a leading priority for patient safety research in developing countries (WHO, 2009). Patient safety is

defined as a reduction of risk of harm associated with health care to an acceptable minimum (WHO, 2002). This means that unnecessary care and interventions can be harmful (Donabedian, 1988) and over-medicalisation of care during labour and childbirth also represents substandard care (Delvaux et al., 2007).

The review of the existing literature (spanning a decade) which identified high rate of interventions with several problematic practices indicates that most hospitals in developing countries have not followed EBP (Maimbolwa et al., 1997; Khayat and Campbell, 2000; Colomar et al., 2004; Khalil et al., 2005; Wick et al., 2005; Conde-Agudelo et al., 2008; Karolinski et al., 2009; Shaban et al., 2011; do Carmo Leal et al., 2014). Ensuring the care pathways for spontaneous vaginal births follow evidence-based standards is an urgent priority for improving quality of care in developing countries (Bastos et al., 2007). However, the reduction of unnecessary interventions and the adoption of EBP in daily childbirth practice remains a challenge.

Beneficial practices

The assessment of women's physical well-being is vital for the prevention and detection of infection, haemorrhage and hypertensive disorders and has implications for the final outcome of birth, and can therefore influence the management of labour (WHO, 1996). The results of this study showed that there was variation in monitoring of women's well-being during labour which should be reviewed; a positive observation was the assessment of physical well-being for all women in admission and control of blood pressure in the third stage of labour as these are life-saving practices. Studies which assessed care during labour in developing countries rarely recorded the assessment of women's well-being during labour. The assessment of vital signs during labour was one of the domains in Simbar et al.'s study (2009) in Kurdistan (Iran) which scored the lowest in their evaluation of quality of care (Simbar et al., 2009). The monitoring of women's well-being during labour was irregular in Egyptian hospitals. Blood pressure was not assessed at all either in admission or before childbirth for one fifth of women (Khalil et al., 2005).

According to Iranian guidelines for normal childbirth (MOHME, 2006), FHR should be checked every 30 minutes and 15 minutes in first and second stage of labour respectively. However, the results of observations showed that FHR was checked and recorded every 15 in first stage of labour using EFM in majority of women. Iranian guidelines for normal childbirth (MOHME, 2006) also advise against the routine use of EFM during normal childbirth but majority of women's labour was augmented and consequently low risk women's labour was checked like high risk women (Cunningham et al., 2010).

The partogram which is suggested by Iranian guidelines (MOHME, 2006) for normal childbirth was not used in the study hospitals, but the details of the partogram such as the results of vaginal examinations and FHR were recorded. The routine use of the partogram as a standard labour management tool is not recommended by the latest Cochrane review (2013) as further evidence is required to establish its benefit (Lavender et al., 2013). However the WHO's recent document on augmentation of labour guide (2014) has a strong recommendation for the use of the partogram in the active phase with a 4 hour action line (WHO, 2014). It is a useful tool for providing a graphic overview of progress, facilitating the transfer of care as well as clinical audit and should be used in conjunction with a standard labour management protocol in order to maximise the benefits. The use of partogram is rarely reported in the different studies which documented EBP in developing countries. The use of partogram was irregular in Zambia (Maimbolwa et al., 1997) and seldom used or filled in or completed after delivery in Ivory Coast (Delvaux

et al., 2007). It was used in 70% of deliveries in Uganda but the standard monitoring of FHR was completed only in 2% (Ogwang et al., 2009). This can be due to time constraints and the shortage of maternity care providers in many developing countries. The use of partogram should be taught in workshops and encouraged among caregivers through supervision and audits.

AMTSL (Begley et al., 2010) is suggested by Iranian National Guidelines for Normal Childbirth (MOHME, 2006). It is a safe, cost-effective, sustainable intervention and a major contributor to maternal mortality reduction in low- and middle-income countries (Begley et al., 2011). The results of observations showed that AMTSL was not followed consistently but components of this practice were used actively in most cases which were good and life-saving practices. Similar the use of an uterotonic medicine during third stages of labour was widespread in other studies (Delvaux et al., 2007; Stanton et al., 2009). However the correct use of AMTSL from seven developing countries in Africa, Asia and Latin America, was only reported in 0.5–45% of the observed deliveries (Conde-Agudelo et al., 2008; Stanton et al., 2009). The correct use of life-saving practices for removal of the placenta in the third stage of labour is a factor that may have contributed to reducing the maternal mortality ratio in Iran. Iran is included in the ten countries which have already reached the 5MDG target of 75% reduction in maternal death (UNFPA, 2012). The implementation of AMTSL has been strongly recommended to reduce maternal death due to postpartum haemorrhage (ICM and FIGO, 2013). In developing countries, many women's health status is already compromised by anaemia at the time of childbirth and as a consequence even a small blood loss is potentially dangerous. In addition, failure of the uterus to adequately contract after childbirth (uterine atony) causes bleeding and is the leading cause of postpartum haemorrhage (WHO, 2006a). This can be prevented by implementing AMTSL as a lifesaving practice in all deliveries. The correct use needs to be implemented by informing caregivers about this practice.

Skin-to-skin contact which is encouraged by Iranian guidelines for normal childbirth (MOHME, 2006) was observed in the study hospitals but was incomplete and needs to be reviewed. The majority of women in the study hospitals only had an opportunity to hug their infants for a few minutes after birth. A Cochrane review (2012) found an important positive effect of early skin-to-skin contact on breast feeding at one to four months post birth and increased breast feeding duration (Moore et al., 2012). Though, there are high rates of this practice in the Netherland and the UK (Kvist et al., 2011; Redshaw and Heikkila, 2010), the use of this practice has been rarely reported and few studies are available from developing countries (Khalil et al., 2005).

The majority of women interviewed in early post partum were supported to initiate breast feeding within 1–3 hours after childbirth in postpartum wards (in all study hospitals 'rooming in' was put in place and all women have their babies beside them). Iran showed a favourable situation in terms of breast feeding rates and promotion of breast feeding at the national level, 90% and 57% of infants were breast fed until one and two-years of age, respectively (Olang et al., 2009). Breast feeding is a traditional norm in Iran, according to the Quran, mothers should breast feed their babies for two years. Additionally, the country adopted it as a national law and implemented all aspects of the Code in 1991 (Zareai et al., 2007). The encouragement and support of women to initiate breast feeding as early as possible may contribute to the high rate of breast feeding.

Ineffective or harmful practices

The results of this study indicated the high rate of augmentation or active management of labour. According to WHO (1996)

augmentation of labour by Oxytocin is considered as a major intervention and should only be implemented with a valid indication (WHO, 1996). Active management of labour should only be used when labour progress is slow (Pates and Satin, 2005). The admission to labour ward in early labour may increase the duration of labour, the incidence of complications, and the use of obstetric interventions including CS (Flamm et al., 1998; McNiven et al., 1998; Jackson et al., 2003; Klein et al., 2004; Bailit et al., 2005; Rahnama et al., 2006). The association between early admission and high rate of augmentation in labour is reported by another study in Tehran (Rahnama et al., 2006). The rate of CS was higher in the group who had been admitted in early labour and 'dystocia' (abnormal progress of labour) was the main reason for CS. The high rate of augmentation of labour is reported in developing countries such as Brazil (65%), Egypt (91%), Jordan (95%) and it was common practice in Istanbul hospitals (d'Orsi et al., 2005; Khalil et al., 2005; Wick et al., 2005; Turan et al., 2006; Shaban et al., 2011). Since early admission in labour might be one of the reasons which has contributed to the high rate of CS in Iran, Iranian guidelines for normal childbirth (MOHME, 2006) mention this practice and advise that it should be restricted. The correct use of Iranian guidelines for normal childbirth may solve this problem and contribute to a reduction of CS rates in Iran.

Additionally interviewed women who admitted without labour pain were induced using Oxytocin despite a low risk pregnancy. This contradicts the definition of normal childbirth as 'spontaneous in onset, low risk at start of labour and remaining so throughout labour and childbirth' (WHO, 1996). Such an induction without specific indication is not recommended in women with an uncomplicated pregnancy at gestational age less than 41 weeks. There should be a clear medical reason and potential beneficial outcomes should outweigh potential risks (WHO, 2011). Induction is associated with a significantly increased risk of CS for women, especially first time mothers (Seyb et al., 1999; Luthy et al., 2004; Vrouenraets et al., 2005; Main et al., 2006; Guerra et al., 2011). This practice of induction in a low risk pregnancy does not follow Iranian guidelines and should be avoided.

The use of fundal pressure during the second stage of labour was widespread in the study hospitals. Fundal pressure is a widely used practice which involves using the hands (manual fundal pressure) on abdomen of mother to assist spontaneous vaginal childbirth and avoid prolonged second stage (Verheijen et al., 2009). This practice is common in many low and middle income countries (Miller et al., 2003; Davis-Floyd, 2007; do Carmo Leal et al., 2014) whereas it is out-dated practice in Western countries. The prevalence is rarely reported, it was 24% in one setting in Alexandria (Egypt) (Moiety and Azzam, 2014) and 37% in Brazil (do Carmo Leal et al., 2014).

Although the last Cochrane review (2009) shows that this practice is understudied and no systematic evidence available to conclude on beneficial or harmful effects of manual fundal pressure (Verheijen et al., 2009), strong recommendations exist to avoid its use (Api et al., 2009). Few studies found an increased risk of severe perineal laceration, extension of episiotomy, admission to neonatal intensive care unit, increase in dyspareunia and stress urinary incontinence (Api et al., 2009; Matsuo et al., 2009; Mahendru, 2010; Moiety and Azzam, 2014) whereas case reports suggest that fundal pressure is associated with uterine prolapse (Tukur et al., 2007), uterine rupture (Pan et al., 2002). Furthermore maternal discomfort, exhaustion or pain from excessive pressure on the mother's abdomen is a matter for concern which contributes to women's negative experiences (WHO, 1996; Verheijen et al., 2009; Mahendru, 2010). Effective methods for supporting women during childbirth with a known risk profile should be promoted when there is a delay in second stage due to uterine contraction and mother exhaustion and it would be wise to avoid this practice.

According to Iranian guidelines, episiotomy should not be used routinely; however, episiotomy was a common practice in the study hospitals. Reports from Arab countries, Turkey, Ivory Coast and China showed high rates of episiotomy (Khayat and Campbell, 2000; Qian et al., 2001; Kropp et al., 2005). There is evidence to support the restrictive use of episiotomy compared to its routine use (Caroli and Mignini, 2009). Furthermore, the birth attendant's skill is the key factor in avoiding perineal harm during birth, and midwifery care results in fewer episiotomies (Hattem et al., 2008). In the context of Tehran public hospitals, the high rate of deliveries and augmentations using Oxytocin might be one of the reasons for giving more episiotomies to finish the process of labour quicker. Additionally, midwives were less involved in the care for normal childbirth in teaching hospitals and also cannot provide care independently in non-teaching hospitals. In the UK maternity services, in which midwives are the main caregivers, the national survey (2010) reported the overall rate of episiotomy to be 25% less, minor tears not requiring stitches (15%), tears which needed stitches (38%) (Redshaw and Heikkila, 2010).

Qian et al. (2006) reported in a study from China that the use of episiotomy was routine in 1999, and it remained high in all hospitals in 2003 even after the introduction of EBP. The rate of episiotomy decreased from 41% to 30% in hospitals in Argentina and Uruguay using multifaceted behavioural intervention (Althabe et al., 2008a, 2008b) which demonstrates that it is possible to reduce this practice. It seems that 'opinion leaders' (Chaillet et al., 2006; Althabe, 2007; Althabe et al., 2008a, 2008b) of obstetricians and also experienced midwives might be more effective to change provider's behaviour and this should be trialled in Tehran public hospitals.

Place of birth and rate of interventions

The results of this study showed that there was a high rate of induction in a non-teaching hospital with special organisational framework. This framework often leads to early admission to the labour ward and the induction or acceleration of labour as a routine. This result is consistent with Turan et al. in Istanbul hospitals (Turan et al., 2006). Indeed, health system organisational framework has an important effect on practice and consequently it plays a main role in the change of practice.

According to results of this study, women in a non-teaching hospital (hospital C) in which midwives were more involved in care during labour and childbirth, women were examined less and by fewer caregivers and had more opportunities to walk during labour. Midwives in this hospital could manage normal births under supervision of obstetricians. The principles of midwifery model of care indicate that pregnancy and childbirth are a normal process and suggests appropriate use of technology. Therefore midwifery aims for the evidence-based model of maternity care and promotes evidence-based practice (Albers, 2007). Strong evidence indicates that midwifery model of care reduces interventions, improves quality of care during labour and childbirth and makes birth safer for mothers and their new-borns (Hattem et al., 2008; Renfrew et al., 2014). According to the Lancet midwifery series (2014), midwifery care led to more effective use of resources with better outcomes when provided by midwives, who were educated, trained, licensed, and regulated. It has been suggested that national investment in midwives and in their work environment, education, regulation, and management can improve quality of care (Renfrew et al., 2014; ten Hoope-Bender et al., 2014). Midwives have made an important contribution to the expansion of safe motherhood programs in the world (Mirmolaei and Shakari, 2001). Similarly Iranian midwives are educated, trained and licensed according to international standards (ICM, 2011). They contributed to the provision of care during pregnancy, labour

and childbirth and the promotion of family planning during the postnatal period during the safe motherhood programme when the country recorded a high maternal mortality ratio. They went to disadvantaged areas for 1–2 year after graduation and worked in very challenging situations in remote health facilities. The safe motherhood programme achieved 98% coverage of antenatal care with at least six visits (MOHME, 2008) and a 75% reduction in maternal death (UNFPA, 2012). Despite of their role as professional caregivers, midwives are nowadays marginalised and not given adequate responsibility in Iranian maternity services. International standards recommend 30–50 midwives for every 1000 births. The ratio reaches only 12 midwives per 1000 birth in Iran (Bahadoran et al., 2009) and can be improved, because 35,000 out of 50,000 midwives in the country are unemployed (IMNA, 2014). National investment on programs which involve midwives more in the care for normal childbirth for which they have been trained will help to improve the quality of care during normal labour and childbirth and may save significant national resources.

Safety and cost

As the current maternity care has increased risks for low risk women and their new-borns, WHO has stressed maternal and new-born health as a leading priority for patient safety research in developing countries (WHO, 2009). Oxytocin has recently been added by the Institute for Safe Medication Practices to a small list of high-alert medications which are drugs that ‘bear a heightened risk of causing significant patient harm when they are used in error’ (ISMP, 2014). All women who took part in this study were low risk women but the almost universal use of Oxytocin for augmentation of labour transformed them into high risk which demanded strict and continuous monitoring of FHR and contractions using EFM (Cunningham et al., 2010). Indeed in the context of developing countries including Iran, it is an unsafe and harmful practice which might increase the rate of complications. A risk assessment of women in admission may decrease the rate of interventions for low risk women and reduce the number of women labelled as complicated labour.

It is argued that using unnecessary and ineffective practice during childbirth is tragic in developing countries, it results in lack of financial resources for essential care for women in the public sector (Garner et al., 2004; Lariccia and Pinnelli, 2009). The costs of early admission of women in latent phase, augmentations and inductions by Oxytocin which may increase the rate of CSs as well as use of episiotomy and complications related to these interventions are considerable and difficult to justify. Therefore an economic analysis of the use of these interventions in Tehran public hospitals is recommended.

Study limitations

This was a small descriptive evaluation study. The number of deliveries observed was small in relation to the total number of births in the study hospitals. Therefore the results cannot be generalised and was not the aim of this study. This study was carried out only in four public hospitals in Tehran. Three different types of public hospitals which provided services mainly to women from low income families in Tehran were selected for this study. While it is likely that care in other public hospitals in Tehran and other provinces of Iran is similar, the findings cannot be generalised. The observation of some practices was not feasible and only a limited number of practices were selected for observation. The reported augmentation or induction of labour as well as vaginal examinations exclusively relied on information provided by interviewed women.

Conclusions

This evaluation sheds light on actual practices that women experience during labour and childbirth, highlights good practice and areas for improvement where practices fail to meet evidence based standards. Iranian National Guidelines for Normal Childbirth have included EBP. However closing the gap between guidelines based on best evidence and actual clinical practice in childbirth demands multidimensional interventions. Thus, there is potential for quality improvement and economic savings in Tehran maternity hospitals. Using different quality improvement strategies such as organisational interventions as well as interventions to change providers' attitudes towards a culture of birth as a normal and physiological process are likely to be important in the Iranian context. Further research needs to explore caregivers' perspective about implementing evidence-based care in childbirth in Tehran public hospitals.

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Conflict of interest statement

The authors declare that they have no competing interests.

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