Implementation of a labour companionship model in three public hospitals in Arab middle-income countries

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ABSTRACT

Aim: To assess the feasibility, acceptability, effectiveness and cost of the integration of a tailored labour companionship model in three public hospitals in Egypt, Lebanon and Syria. Methods: Phased implementation research using mixed methods. Implementation strategies consisted of steering committees in hospitals, seminars for healthcare providers, information, education and communication materials, and adjustments in labour rooms. The labour companionship model consisted of (i) identification of a female relative as labour companion by women; (ii) provision of information, education and communication materials to women and companions; and (iii) allowing companions to accompany women throughout the first stage of labour. Semi-structured interviews with women, labour companions and healthcare providers were used to assess feasibility and acceptability of the model. Effectiveness was assessed through structured interviews with women, information abstracted from medical records and cost data. The comparison was made between the pre-implementation and the implementation phases.

Results: This model was found to be feasible, acceptable, effective and cost-beneficial. Women’s satisfaction and perception of control improved and caesarean section rates were reduced significantly.

Conclusion: This model can be adopted for these countries and elsewhere with comparable health systems. It enhances the quality of care and the provision of equitable and respectful maternity services.

INTRODUCTION

Quality of care during childbirth in health facilities has been recognised as an important dimension in global efforts towards the reduction in maternal and neonatal mortality and morbidity beyond universal coverage of life-saving interventions (1). The World Health Organization (WHO) quality of care framework for maternal and newborn health identifies the experience and the provision of care within healthcare systems as interlinked dimensions determining quality of care. It acknowledges the importance of receiving effective communication, respect and emotional support for women to determine the quality of their experience with childbirth care (2).

Providing support during labour improves the process of normal labour and birth and enhances women’s feelings of control during labour, eventually reducing the need for obstetric interventions. Evidence from a systematic review (3) has shown that women who receive continuous support during labour are more likely to deliver spontaneously and therefore require fewer caesarean sections or operational deliveries; have shorter length of labour; are less likely to require intrapartum analgesia; are more satisfied with their labour experience and perceive control during labour.

Key notes

- A labour companionship model was introduced in three public hospitals in Egypt, Lebanon and Syria and assessed for feasibility, acceptability, effectiveness and cost in a phased mixed-methods implementation research study.
- The model reduced caesarean sections and improved women’s satisfaction with childbirth and perception of control during labour.
- Developing a model for labour companionship in different settings requires consultation with stakeholders including women, health providers and management.
childbirth experience; and are less likely to have a baby with a low five-minute Apgar score. Studies from the Arab region have shown similar outcomes in terms of reducing length of labour, less need for analgesia and labour augmentation and improved birthing experience when introducing labour companions during hospital births (4–6).

Despite the decline in maternal mortality in Arab countries observed in recent years (7), and majority of births being attended by skilled professionals (79% in Egypt (8); 98% in Lebanon (9); and 96% in Syria (8)), women in this region suffer from problems beyond access to obstetric services. These range from routine use of unsafe practices (10) to failure to take women’s preferences into account (11–13) and excessive levels of medical interventions, such as caesarean section (14). Latest reports on caesarean section rates point to high levels reaching 27% in Egypt (15) and 41% in Lebanon (16) and ranging between 12% (public facilities) and 23% (private facilities) in Syria (17). In addition, an unstable political environment influences access and provision of health care. In Syria, around one-third of public healthcare facilities reported being nonfunctional in 2015 (18).

Wide variation in hospital policies exists regarding labour companionship in Arab countries (10). Public hospitals have generally not adopted this practice, whereas private hospitals do allow labour companions. This is in contrast with women’s preferences for the presence of someone they know during labour and birth (6,11,13). The culture of hospital care that emphasises the management of high-risk cases has encouraged restrictive policy and practices on labour companionship. Formative research conducted prior to this study showed that the busy workload, shortage of nursing staff, crowded shared labour rooms and the healthcare providers’ uncertainties about the role of labour companions reinforce the absence of policies (13). This work informed the researchers about the necessity to tailor the labour companionship model to enhance its acceptability and implementation in our contexts.

A multicenter implementation research study was conducted to integrate the practice of labour companionship in public hospitals in three Arab middle-income countries: Egypt, Lebanon and Syria. It evaluates a labour companionship model using a lay female relative based on the needs and expectations of women while considering health system constraints and barriers to implementation in these settings. The study’s ultimate goal is providing contextualised evidence to policymakers and healthcare providers on the effectiveness and feasibility of the model for sustainable change.

The specific objectives of this study were to (i) assess the feasibility of introducing the labour companionship model in three public hospitals; (ii) assess the acceptability of the labour companionship model from the perspective of women, companions, healthcare providers and hospital management; (iii) test the effectiveness of the labour companionship model in reducing caesarean section rates in the hospitals; and (iv) conduct a cost analysis of providing a labour companionship model in the hospitals.

Figure 1 Labour companionship model study phases.

METHODS

This study used a mixed-methods approach combining a quasi-experimental design with qualitative methods through three phases (Fig. 1).

Study setting

This study was conducted in three public tertiary university hospitals that provide care to low and middle socioeconomic populations: one in each of Mansoura, Egypt; Beirut, Lebanon; and Damascus, Syria. Around 80% of users of the hospital in Beirut were Syrian refugee women. The hospital in Damascus served internally displaced women as well as Damascus residents. The hospital in Damascus offered care in both private and public sections, while the ones in Beirut and Mansoura were entirely public. Maternity care in these hospitals lacked continuity throughout the antenatal, intrapartum and postnatal periods. Labour care was provided by nurses and residents in Mansoura hospital and by midwives and residents in Damascus and Beirut hospitals. Labour rooms were shared between four and six women in Mansoura and Damascus hospitals. Women were cared for in private labour rooms in the Beirut hospital. There were no policies in the three hospitals supporting labour companionship. The hospital in Beirut allowed labour companions based only on the discretion of healthcare providers and not in a systematic and institutionalised manner.

Implementation strategies

The strategies used for the implementation of the labour companionship model are presented in Table 1. A steering committee was formed in each hospital. These committees oversaw and facilitated the implementation, adjusted the process to their context, assigned key personnel responsible for implementation and proposed and approved channels of communication. The steering committees and the research team organised two seminars in each setting. Information, education and communication (IEC) materials were developed based on site visits, regional team meetings and formative research (13). The posters were placed in all labour rooms, waiting areas and nursing stations. Sixty care providers were trained on the use of the flipchart by the study team. The flipchart was designed for
Participants

All low-risk women who were over 18 years old, who arrived with a female relative to the hospital and were planning a vaginal birth were eligible for the study upon their admission to the public section of the hospital in Syria and to the labour wards in the hospitals in Egypt and Lebanon. There were no refusals, and only two cases of intrauterine foetal death were excluded.

For the qualitative component, purposive samples of women giving birth and their labour companions were selected ensuring variability in parity and in family members serving as labour companions. Healthcare providers were selected to represent obstetricians, midwives, nurses and residents. The interviews were spread over the period of the implementation phase of the study.

The sample size was calculated based on the average caesarean rates in the three countries (35%), an estimated reduction of 4%, a power of 85% and a significance level of 5%. This totalled to 2477 women to be recruited in each phase. The initial plan was to add 15% on the calculated sample size to account for refusals, however, that was not necessary as we did not encounter refusals during fieldwork. The achieved sample size consisted of 2620 women in the pre-implementation phase and 2491 women in the implementation phase. For the qualitative interviews, purposive samples were drawn guided by the data saturation principle.

Outcomes

The primary outcome indicator for the effectiveness assessment is the caesarean section rate. Other outcomes of interest included the length of labour, Apgar scores, satisfaction with childbirth, women’s perceived control and cost.

Data sources

Four data collection tools were used:

1. The structured questionnaire included (i) sociodemographic data: women’s and husbands’ education level, employment and age; (ii) The Mackey Childbirth Satisfaction Rating Scale was used to measure women’s satisfaction. It is a 34-item, five-point Likert scale, with six subdimensions addressing self, partner, baby, nurse/midwife, physician and a general rating scale (19). It was translated to Arabic and adapted to a 31-item scale (20); (iii) The shortened 10-item Labour Agency Scale (LAS) with seven-point Likert scale was used to assess women’s perception of control during labour (21). The scale was translated to Arabic and back-translated to English. Coding was reversed for the negatively worded items so that higher scores reflect a higher personal control.

The questionnaire was pilot-tested for comprehension and language accuracy in the three sites.

2. Form for abstraction of data from medical records: It included information on the length of labour (period between the time of admission and time of birth), Apgar scores and type of birth.

3. Interview guides: for semi-structured interviews with women, companions and healthcare providers to address experiences with the labour companionship model, role in the implementation of the model and perceived barriers and facilitators.

4. Observation checklist for recording adherence to the labour companionship model. A schedule of 20 shifts in the labour room distributed between day and night was used for observation. All women in the same labour room were observed during the same shift.

Table 1 Implementation strategies for labour companionship model

| Strategy          | Details                                                                 |
|-------------------|-------------------------------------------------------------------------|
| Steering committee| Healthcare providers, hospital managers and study team members (composition varied slightly by site). Decision-making about facilitating implementation. |
| Seminars          | Steering committee and the study team held seminars for different groups of healthcare providers at different stages of the implementation addressing the evidence on labour companionship and informing about the study. |
| IEC materials     | Two-sided flipchart detailing the role of companions used to facilitate briefing of companions and labouring women. Three posters: one addressing healthcare providers and two addressing companions about the importance of labour companionship and the regulations of the labour rooms as reminders of messages covered in the flipchart. The Arabic dialect and pictures on materials were adjusted for use in the three sites. Draft materials were tested for acceptability and comprehensibility. |
| Adjustments in labour rooms | Chairs for the use of companions, curtains or separators around beds, access to hot water and toilet facilities, disposable gowns and nametags for companions. |
In addition, cost data were collected from each hospital as programme initiation costs (adjustments to labour rooms, IEC materials development and training) and as recurrent costs (gowns for companions and personnel cost for staff using IEC materials). These were estimated to serve for one year. No research or research support costs were included in the estimation.

Data for the pre-implementation phase were collected from November 2014 to August 2015 in Beirut and Mansoura, and from November 2014 to April 2015 in Damascus. The implementation phase extended from October 2015 to August 2016 in Mansoura and Beirut and from October 2015 to March 2016 in Damascus.

Analysis
Quantitative analysis was conducted using SPSS software v. 24. The difference in the proportions in caesarean section and Apgar scores in the pre-implementation and implementation phases was compared using chi-square statistics. The mean differences in length of labour, satisfaction and perception of control were assessed using two-sided t-tests. A significance level of 0.05 was considered throughout the analysis.

Semi-structured interviews were transcribed verbatim at each site separately. The study team in each country engaged in the reading of the transcripts to identify categories and themes. Matrices were constructed and shared with the teams in other sites. Thematic analysis was conducted.

The economic evaluation analysis assumed the perspective of the hospital (costs) and the payer (benefits). Costs common across the three country sites (e.g. IEC materials development) were separated where necessary and counted individually for each country when such costs would have to be incurred for replication of the model. Since out-of-pocket payment for health services in public hospitals is minimal, the cost of birth in the selected hospitals was considered. The benefits considered were the percentage reduction in the caesarean section rates, taking into consideration the annual number of births in each hospital. A cost-benefit analysis was performed where the total costs of the implementation and the total benefits in monetary terms were calculated as the difference between the cost of caesarean sections and vaginal births and the total number of women experiencing vaginal births.

Ethical considerations
The Institutional Review Board at AUB and the Ethics Review Committee of WHO approved the study. The approval of hospital managements and participants’ informed consents was obtained.

RESULTS
Participants
The participants included in the quantitative analysis consisted of 2523 women (pre-implementation) and 2491 women (implementation phases) after accounting for missing information in some records. No significant differences in women’s characteristics comparing the two study phases were noted (Table 2). Women’s mean age was 26.09 years and 25.41 years. Most women and their husbands were of low educational level. The majority of the women were unemployed and slightly more than one-third were primiparous. Participants in semi-structured interviews consisted of 19 women, 17 companions and 20 healthcare providers (eight midwives, eight residents and four obstetricians) in Lebanon; 20 women, 20 companions and 29 healthcare workers (13 residents and 16 nurses) in Egypt; and 20 women, 20 companions and 20 healthcare workers (six obstetricians, seven residents and seven nurses/midwives) in Syria.

Feasibility
The formative research (13) was instrumental for designing a feasible intervention. Establishing steering committees ensured a participatory approach for all healthcare providers. It enforced the feeling of ownership and empowered junior providers and midwives. It also facilitated the enforcement of decisions made by the committee and the close involvement of the hospital management in the study activities. The adjustments made in shared labour rooms in the hospitals in Mansoura and Damascus (separators, curtains and chairs) minimised the barriers perceived by healthcare providers. The culturally tailored IEC materials were developed with the aim of improving the

| Table 2 Sociodemographic characteristics of women in pre-implementation and implementation phases |
|---------------------------------|-----------|-----------|
| Characteristics                 | Pre-implementation | Implementation |
|                                 | N = 2523 | N = 2491 |
| Age                             | 2522     | 2476     |
| Mean/SD                         | 26.09/5.69 | 25.41/5.87 |
| Education of woman              |          |          |
| Illiterate                      | 206      | 131      |
| Elementary                      | 675      | 691      |
| Intermediate                    | 763      | 927      |
| Secondary                       | 558      | 467      |
| University                      | 321      | 272      |
| Employed                        |          |          |
| No                              | 2339     | 2353     |
| Mean/SD                         | 92.9     | 94.5     |
| Yes                             | 179      | 136      |
| Mean/SD                         | 7.1      | 5.5      |
| Gravida                         |          |          |
| Primigravida                    | 900      | 926      |
| Multigravida                    | 1622     | 1560     |
| Education of husband            |          |          |
| Below secondary                 | 1668     | 1741     |
| Mean/SD                         | 66.6     | 70.2     |
| Secondary and university        | 835      | 740      |
| Mean/SD                         | 33.4     | 29.8     |
| Husband employed                |          |          |
| No                              | 148      | 86       |
| Mean/SD                         | 5.9      | 3.5      |
| Yes                             | 2348     | 2369     |
| Mean/SD                         | 93.1     | 95.1     |
| Not present                     | 25       | 35       |
| Mean/SD                         | 1.0      | 1.4      |

SD = standard deviation.
communication between the labour companions and healthcare providers and to reduce the negative attitudes of healthcare providers towards the role of labour companions. These minimised healthcare providers’ uncertainties about the labour companion’s role, lack of opportunities to provide information to women and companions, and expected disruptions due to the presence of the companion (13). We assessed the feasibility of implementing the model in each hospital through revising the minutes of the steering committees and through discussions during the regional study team meetings. These are summarised in Table 3.

Acceptability
The companionship model was compatible with women’s needs for having a trusted family member’s support, ‘someone to hold their hand and encourage them’ in order ‘not to feel alone’ during labour.

Companion’s presence makes childbirth easier, quicker, and I am encouraged because someone from my family is next to me. (Woman, Lebanon)

It (childbirth) is a tough experience, but I felt comfortable in the presence of family. She talked to the doctor instead of me, because I couldn’t. (Woman, Egypt)

The model gave an opportunity for family engagement in the process of care within the facility. Family members who had a previous experience in the same setting perceived ‘better treatment’ in terms of improved communication and attention. The companions found the information on the IEC materials as being ‘useful’ and ‘excellent’.

I saw an improvement from when my daughter-in-law gave birth in here eight months ago and now with my daughter. I was not able to see my daughter-in-law. This is an excellent improvement. (Companion, Syria)

It shows that someone cares about us, we love this way, we didn’t feel like we were strangers, we felt like we were in our country. Thank you. (Companion [Syrian refugee], Lebanon)

Table 3 Factors enhancing feasibility of implementing the labour companionship model

| Factor                                      | Egypt | Lebanon | Syria |
|---------------------------------------------|-------|---------|-------|
| Formative research                          | ✔     | ✔       | ✔     |
| Steering committees                         | ✔     | ✔       | ✔     |
| Adjustments to labour rooms                 | ✔     | ✔       | ✔     |
| Monitoring by steering committee            | ✔     | ✔       | ✔     |
| Introduction of new hospital regulations    | ✔     | ✔       | ✔     |
| labour companionship                        | ✔     | ✔       | ✔     |
| IEC materials and training workshops        | ✔     | ✔       | ✔     |
| Engagement of junior physicians, nurses and midwives | ✔ | ✔ | ✔ |
| Engagement of hospital management           | ✔     | ✔       | ✔     |

Effectiveness
Figure 2 presents the effectiveness on clinical outcomes for the three sites and the total sample. The proportion of caesarean section births dropped significantly from 22% to 11% [P = 0.000; 95% confidence interval (CI): 0.09–0.13] and Apgar score below or equal to 6 declined from 11.6% to 6.7% (P = 0.001; 95% CI: 0.03–0.06). The length of labour
increased significantly by 30 minutes, from four hours 39 minutes to five hours nine minutes \((P = 0.001; 95\% \text{ CI}: 12–47)\). The largest significant improvement in the proportion of caesarean section births was observed in Egypt (32.2% to 4.1%). In Syria, there was a significant decline in caesarean section births (17.3% to 12.8%) and significant improvements in Apgar scores. In Lebanon, the decline in Caesarean section births (19.3% to 15.8%) was not statistically significant.

Women’s satisfaction during childbirth improved from 113.39 to 115.98 points \((P = 0.000; 95\% \text{ CI}: 5–8)\) in the total sample as well as in the three sites separately. Similarly, women’s perception of control during labour increased from 44.86 to 46.99 points on the LAS \((P = 0.000; 95\% \text{ CI}: 1.5–2.7)\) in the total sample as well as in each site (Fig. 3).

**Cost**

The cost-benefit ratio in Lebanon ranged between 9.48 and 11.79, indicating that, for every USD1 spent on the development and implementation of the model, between USD9.48 and USD11.79 is expected in benefits. In Syria, the cost-benefit ratio of 4.59–6.17 was lower compared to Lebanon, meaning that for every USD1 spent, we can expect USD4.59–USD6.17 in benefits. The cost-benefit ratio range was wider in Egypt (3.94–29.86), with the

![Figure 2](image1.png) **Figure 2** Distribution of clinical outcomes between the pre-implementation and the implementation phases in the three country sites and the total sample.

![Figure 3](image2.png) **Figure 3** Distribution of women’s satisfaction and perception of control during labour between the pre-implementation and the implementation phases in the three country sites and the total sample.
benefits in monetary terms between USD 3.94 and USD29.86 for every USD1 spent on development and implementation (Table 4).

**DISCUSSION**

The findings of this study demonstrate that labour companionship can be successfully introduced in the context of public hospitals in Egypt, Lebanon and Syria. The benefits outweigh the costs across the three countries.

The implementation strategies used improved the feasibility of integrating the practice in these settings, especially the changes introduced in the labour rooms and the engagement of the steering committees in the implementation process. Similar experiences were reported in previous studies conducted in middle- and low-income settings (22–25). In terms of the acceptability, the model was found to be compatible with women’s and their families’ needs. The IEC materials minimised the barriers identified through the formative study (13) and supported by the literature (26). The presence of the labour companions was perceived to be useful in reducing the workload of nurses and midwives through minimising the dependency of women on staff. Similar findings were reported from settings with shortages in nurses and midwives (24,27,28). The perceived ambiguity about the sustainability of this practice among obstetricians and residents remains an issue that needs further efforts. The importance of influencing the attitudes of healthcare providers has also been reported as an important factor in the successful implementation of labour companionship interventions elsewhere (28,29).

This labour companionship model was successful in reducing caesarean section births and improving Apgar scores in these hospitals in parallel with improving women’s satisfaction and their perception of control during labour. These findings are compatible with the evidence on continuous support during childbirth and with the most beneficial form of support being provided from a person who is not a family member or a friend and not a healthcare provider at the facility and in their absence someone chosen by the woman from among her family or friends (3). This was further substantiated by the findings of the formative study that labouring women’s preferred labour companions were their mothers or sisters in these three sites (13). The differences in the level of improvement in the outcomes between the sites are a factor of variations in the organisation of care between the facilities. It could also be explained by the fact that the presence of labour companions was a complete novelty for the hospitals in Syria and Egypt, whereas it was practiced in Lebanon although not in a systematic manner.

Responding to our implementation research question, we aimed at assessing the feasibility and the acceptability of the labour companionship model in the context of these three hospitals. However, in order to address decision makers, we also needed to assess impact and effectiveness. Considering the fact that the intervention was based on already established evidence and a recommended best practice, the use of a randomised controlled design was not needed.

**Contextual factors**

Throughout the course of the study, the research team faced a number of challenges. The hospital in Beirut closed for a number of weeks as a result of staff strikes and failure of sterilisation equipment. The policy in the hospital in Mansoura followed the Egyptian healthcare system whereby admissions were only allowed during certain days of the week. These factors resulted in the extension of the data collection period. The infection control department did not approve the proposed installation of curtains in the hospital in Egypt and the steering committee opted for the use of movable separators between beds.

In Lebanon, midwives were not cooperative during the early implementation period and considered their role in the study as an added burden. Implementation of the model was affected during night shifts due to the social norms of males accompanying labouring women to the hospital at those times and the resulting absence of women family members to serve as companions. It was not possible to extend the companionship model during birth due to major resistance of the hospital staff and management. The study team considered the success of the model as a first step that serves in providing contextual evidence and will be used to pursue the necessity of extending the presence of labour companions during birth.

**Lessons learned to inform scaling-up**

We believe that the labour companionship model developed in this study could be adopted for these countries as well as for other countries with comparable health systems. Indeed, the hospital site in Damascus, Syria, has used the experience learned through the implementation of this model in designing new labour rooms shared by two women with fixed separators between beds and chairs for companions. An initial step in scaling-up will be the replication of this intervention in a number of facilities in each country coupled with the institutionalisation of labour
Labour companionship model

companionship through centrally developed policies for all public hospitals in these countries.

Implementation research methods adopted in this study allowed us to capture the subtleties of the context and gave the required flexibility for changes during implementation and between different sites.

The general culture of medicalisation of childbirth and lack of adherence to evidence-based care will remain a challenge for scaling-up efforts. It is necessary to target the attitudes of healthcare providers towards respectful and woman-centred maternity care (2) and mobilise midwives and nurses to take a central role in the provision of care. These efforts, when achieved, will influence the continuum of antenatal, intrapartum and postpartum care beyond labour companionship and will ensure access to equitable and respectful maternity services.

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CONFLICT OF INTEREST
No conflict of interest to disclose.

DISCLAIMER
Anayda Portela is a staff member of the World Health Organization. The author alone is responsible for the views expressed in this publication and they do not necessarily represent the views, decisions or policies of the World Health Organization.

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References
1. Souza JP, Gulmezoglu AM, Vogel J, Carroli G, Lumbiganon P, Qureshi Z, et al. Moving beyond essential interventions for reduction of maternal mortality (the WHO multicountry survey on maternal and newborn health): a cross-sectional study. *Lancet* 2013; 381: 1747–55.
2. Tuncalp O, Were WM, MacLennan C, Oladapo OT, Gulmezoglu AM, Bahl R, et al. Quality of care for pregnant women and newborns – the WHO vision. *BJOG* 2015; 122: 1045–9.
3. Hodnett H, Gates S, Hofmeyr GJ, Sakala C. Continuous support for women during childbirth. *Cochrane Database Syst Rev* 2013; 7: CD003766.
4. Mosallam M, Rizk D, Thomas L, Ezimokhai M. Women’s attitudes towards psychosocial support in labour in United Arab Emirates. *Arch Gynecol Obstet* 2004; 269: 181–7.
5. Khresheh R. Support in the first stage of labour from a female relative: the first step in improving the quality of maternity services. *Midwifery* 2009; 26: e21–4.
6. El-Nemer A, Downe S, Small N. “She would help me from the heart”: an ethnography of Egyptian women in labour. *Soc Sci Med* 2006; 62: 81–92.
7. Alkema L, Chou D, Hogan D, Zhang S, Moller AB, Gemmill A, et al. Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *Lancet* 2016; 387: 462–74.
8. Global Health Observatory. WHO. Global Health Observatory data repository. Available from URL http://www.who.int/gho/en/ (accessed on March 10, 2017).
9. Ministry of Social Affairs. Lebanon family health survey 2004. Available from URL http://www.cas.gov.lb/images/PDFs/Lebanon%20PAPFAM%20Arabic.pdf. (accessed on March 7, 2017).
10. Choices and Challenges in Changing Childbirth Research Network. Routines in facility-based maternity care: evidence from the Arab World. *BJOG* 2005; 112: 1270–6.
11. Bashour H, Abdulsalam A, Al-Faisal W, Cheikha S. Patterns and determinants of maternity care in Damascus. *East Mediterr Health J* 2008; 14: 595–604.
12. Kabakian-Khasholian T, Campbell O, Shediac-Rizkallah M, Ghorayeb F. Women’s experiences of maternity care: satisfaction or passivity? *Soc Sci Med* 2000; 51: 103–13.
13. Kabakian-Khasholian T, El-Nemer A, Bashour H. Perceptions about labor companionship at public teaching hospitals in three Arab countries. *Int J Gynaecol Obstet* 2015; 129: 223–6.
14. Khawaja M, Choueiry N, Jurdi R. Hospital-based caesarean section in the Arab region: an overview. *East Mediterr Health J* 2009; 15: 458–69.
15. Ministry of Health and Population [Egypt], El-Zanaty and Associates [Egypt], ICF International. *Egypt demographic and health survey 2014*. Cairo, Egypt and Rockville, MD: Ministry of Health and Population and ICF International, 2015. Available from URL http://dhsprogram.com/pubs/pdf/FR302/FR302.pdf.
16. Dejong J, Akik C, El Kak F, Osman H, El-Jardali F. The safety and quality of childbirth in the context of health systems: mapping maternal health provision in Lebanon. *Midwifery* 2010; 276: 549–57.
17. League of Arab States and Syrian Arab Republic. *Family health survey of the Arab Republic of Syria 2009: principal report (PAPFAM)*. Cairo: The League of Arab States, 2011.
18. WHO. HeRAMS annual report January–December 2015. Public Hospitals in the Syrian Arab Republic. Health Information Management Unit, WHO, Syrian Arab Republic, 2016. Available from URL http://applications.emro.who.int/docs/COPub_SYR_Jan_Dec_2015_EN_16659.pdf?ua=1.
19. Goodman P, Mackey M, Tavakoli A. Factors related to childbirth satisfaction. *J Adv Nurs* 2004; 46: 212–9.
20. Kabakian-Khasholian T, Bashour H, El-Nemer A, Kharouf M, Sheikha S, El Lakany N, et al. Women’s satisfaction and perception of control in childbirth in three Arab countries. *Reprod Health Matters* 2017; 25: 16–26.
21. Hodnett ED, Simmons-Tropea DA. The Labour Agency Scale: psychometric properties of an instrument measuring control during childbirth. *Res Nurs Health* 1987; 10: 301–10.
22. Yuenyong S, O’Brien B, Jirapeet V. Effects of labor support from close female relative on labor and maternal satisfaction in a Thai setting. J Obstet Gynecol Neonatal Nurs 2012; 41: 45–56.

23. Brown H, Hofmeyr GJ, Nikodem VC, Smith H, Garner P. Promoting childbirth companions in South Africa: a randomised pilot study. BMC Med 2007; 5: 7.

24. Maimbolwa MC, Sikazwe N, Yamba B. Views on involving a social support person during labor in Zambian maternities. J Midwifery Women Health 2001; 46: 226–34.

25. Qian X, Smith H, Zhou L, Liang J, Garner P. Evidence-based obstetrics in four hospitals in China: an observational study to explore clinical practice, women’s preferences and provider’s views. BMC Pregnancy Childbirth 2001; 1: 1.

26. Banda G, Kafululula G, Nyirenda E, Taulo F, Kalilani L. Acceptability and experience of supportive companionship during childbirth in Malawi. BJOG 2010; 117: 937–45.

27. Madi BC, Sandall J, Bennett R, MacLeod C. Effects of female relative support in labor: a randomized controlled trial. Birth 1999; 26: 4–8.

28. Bruggemann OM, Parpinelli MA, Osis MJ, Cecatti JG, Neto ASC. Support to woman by a companion of her choice during childbirth: a randomized controlled trial. Reprod Health 2007; 4: 5.

29. Campbell DA, Lake MF, Falk M, Backstrand JR. A randomized control trial of continuous support in labor by a lay doula. J Obstet Gynecol Neonatal Nurs 2006; 35: 456–64.

APPENDIX

THE LABOUR COMPANIONSHIP STUDY GROUP

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