International Journal of Community Medicine and Public Health
Khalil EM et al. Int J Community Med Public Health. 2021 May;8(5):2099-2103
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20211724

Original Research Article

Efficacy of home visits by public health providers for high-risk pregnant women in Egypt

Eman M. Khalil[1], Sayed M. S. Abdelgayed[1], Rasha S. Elbahrawe[2], Ahmed M. Abbas[3]*, Marwa Yahia[1], Hamada A. A. Ali[1]

[1]Department of Obstetrics and Gynaecology, [2]Public Health Department, Faculty of Medicine, Beni-Suef University, Egypt
[3]Department of Obstetrics and Gynaecology, Faculty of Medicine, Assiut University, Egypt

Received: 11 March 2021
Revised: 09 April 2021
Accepted: 20 April 2021

***Correspondence:**
Dr. Ahmed M Abbas,
E-mail: bmr90@hotmail.com

ABSTRACT

Background: Home visits programs aim to improve care management for high-risk pregnant women. Birth outcomes, such as preterm birth, low birth weight (LBW), and small for gestational age (SGA), are crucial indicators of child development and health. The present study evaluates the efficacy of home visits by public health providers for high-risk pregnant women in Egypt to prevent adverse pregnancy outcome.
Methods: This is a cohort study using administrative data collected in obstetrics department, Faculty of Medicine, Beni-Suef University. All women with high risk pregnancy were followed by home visits by public health providers.
Results: Birth outcomes were documented and evaluated. Women from the home-visit group had a heavier birth weight 2752.85±286.571, longer gestational age 38.36±1.257, less LBW infants 52 (18.6%), less preterm birth 22 (7.9%), and less SGA infants 27 (9.6%) compared to participants who did not receive the home-visit program.
Conclusions: Our findings suggest that home visits by public health nurses for high-risk pregnant women in Egypt might be effective in preventing preterm birth, but not SGA. This study adds to the evidence of the effectiveness of population-based home-visit programs as a public healthcare measure.

Keywords: Home visit, High-risk pregnancy, Preterm birth, Low birth weight, Prenatal care

INTRODUCTION

Maternal wellbeing has continuously been one of the major health concerns of diverse communities. The reports of World Health Organization indicate that every day, approximately 830 women die from conditions related to pregnancy that can be easily preventable.[1]

High-risk pregnancy incorporates maternal conditions related to high perinatal mortality and morbidity such as diabetes, hypertensive disorders (chronic hypertension and pre-eclampsia), cardiac, renal, and autoimmune disorders.[2] There are conditions that are related to pregnancy and considered 'high risk' as fetal growth restriction, antepartum hemorrhage, multiple pregnancy, and prolonged pregnancy.[3]

Unfavorable birth outcomes, such as preterm birth, low birth weight (LBW), and small for gestational age (SGA), can affect child development and health in a long-term manner.[4] In addition, bad birth outcome is a risk factor for maternal mental wellbeing and child abuse.[5]

Antenatal care is a comprehensive program for care before birth which incorporates coordinated approach to support

women before pregnancy till delivery. This support involves medical and psychosocial aspects.[6]

Antenatal care-related desires of pregnant women include four fundamental categories: provision of sufficient data for women concerning their pregnancy, encouraging women to give informed decisions according to their interests, emotional support, and provision with professional care.[7] Usage of a home-visit program during high-risk pregnancy is a comprehensive methodology to anticipate unfavorable birth outcomes.[8]

Giving domestic health permits the pregnant woman to feel more control over her life status and receive a safe and supervised health care at the same time.[9] On the other hand, with the educational training and preparing provided to pregnant women at home, they learn to alter behaviors that diminish hazard of preterm birth and modify their health life style. Also, it is obvious that domestic following of mothers with high-risk pregnancy, minimizes financial burden on hospitals by decreasing the number of days of hospitalization.[10]

Home - care programs permit health care providers to supply maternal and fetal evaluation, planning issues concerning high-risk cases with health centers, providing the mother with information about high-risk conditions and emphasize on the achieved required service.[11] Thus, this makes it easier for families to share the educational programs and have an improved understanding of effective factors of maternal and child health.[12]

The present study aims to assess effects of home visits by public health providers for high-risk pregnant women in Egypt to prevent adverse pregnancy outcome.

METHODS

This was a cohort study using administrative data collected in obstetrics department, Faculty of Medicine, Beni-Suef University between April 2019 and September 2020. Informed written consent was obtained from each woman to be included in this study. Target participants of our study were all high-risk pregnant women who registered their pregnancy in the obstetric clinic of the university. The study was included 500 pregnant women. Two groups were compared, home-visit group (250) and the no home-visit group (250).

High risk pregnancy was defined as

Women who had past or current physical or mental illness, primiparas under the age of 20, primiparas over the age of 35 with some unfavorable conditions such as poverty, women who were pregnant with twins.[13,14]

Home-visit programs for pregnant women

In this program, trained public health providers make at least1 home visit to high-risk pregnant women lasting for more than 1 hour during mid- or late-term pregnancy. The contents of the home visit were as follows:

Checking women's social support status and linking them to other services in the community, if needed.

Providing information about appropriate nutrition during pregnancy, prenatal care, dental care, and child care.

Asking women about their physical or psychological health and linking them to medical facilities if needed.

If public health providers concluded that the women required more support, they provided follow-up support by phone, made another home visit, or introduced women to further social services support.[15]

Outcomes

Primary outcome was birth weight.

Secondary outcomes were as follows- Parenting knowledge, repeat pregnancy, repeat birth, and gestational age at delivery, birth weight, and maternal weight gain during pregnancy.

RESULTS

Table 1 shows the baseline characteristics of prenatal mothers at pregnancy registration in the study groups.

Table 1: Comparison between the two groups as regard to baseline characteristics.

Variables	Home-visit program (n=250)	No home-visit program (n=250)	P value
	N (%)	N (%)	
Age of mother (mean±SD)	31.32±5.053	30.22±5.326	0.118
Age of husband (mean±SD)	34.71±4.730	34.12±4.988	0.174
Parity			
0	198 (79.2)	133 (53.2)	<0.001*
≥1	52 (20.8)	117 (46.8)	
History of Miscarriage	58 (23)	52 (21)	0.589
History of stillbirth	5 (2)	13 (5.2)	0.090
Twin pregnancy	33 (13.2)	27 (10.8)	0.492

Continued.

Variables	Home-visit program (n=250)	No home-visit program (n=250)	P value
	N (%)	N (%)	
Past or present disease	36 (14.4)	49 (19.6)	0.153
Present mental illness	58 (23.2)	54 (21.6)	0.748
Present physical disease	15 (6)	18 (7.2)	0.719
History of fertility treatment	63 (25.2)	51 (20.4)	0.241
Having someone who can advise on child-rearing			
Husband	70 (28)	60 (24)	0.359
Parents	195 (78)	168 (67.2)	0.009*
Friends	170 (68)	155 (62)	0.189
Having someone who can give support with child-rearing			
Husband	149 (36)	48 (19.2)	<0.001*
Parents	68 (82)	198 (79.2)	<0.001*
Friends	68 (13)	28 (11.2)	<0.001*
Used childcare services			
Yes	199 (79.6)	215 (86)	0.146
Rarely	43 (17.2)	28 (11.2)	
Never	8 (3.2)	7 (2.8)	
Knows someone with experience in child-rearing			
Yes, many people	163 (65.2)	185 (74)	0.088
Yes, a few people	48 (19.2)	33 (13.2)	
No, do not know anyone	39 (15.6)	32 (12.8)	
Low capacity of child rearing	6 (2.4)	13 (5.2)	0.159
Worried about pregnancy due to previous negative experiences of delivery	18 (7.2)	33 (13.2)	0.038*
Worried about			
Child-rearing	113 (45.2)	98 (39.2)	0.205
Money	108 (43.2)	113 (45.2)	0.719
Disease	51 (20.4)	40 (16)	0.246
Partner	16 (6.4)	21 (8.4)	0.495
Lack of support or advice	20 (8)	13 (5.2)	0.280
Job	68 (27.2)	63 (25.2)	0.684

Data are represented in number (n) and (%) percent, mean±SD, (>0.05, non-significant), significant*

Table 2: Comparison between the two groups as regard to birth and maternal outcomes.

	Home-Visit Program (n=250, child: n=280)	No Home-Visit Program (n=250, child: n=276)	P value
Birth weight	2752.85±286.571	2716.62±301.128	0.169
Gestational age	38.36±1.257	38.09±1.309	0.122
LBW (<2500 g)	52 (18.6%)	73 (26.4%)	0.039*
Preterm birth (<37 weeks)	22 (7.9%)	34 (12.3%)	0.118
small for gestational age (<10 percentile)	27 (9.6%)	40 (14.5%)	0.115
Sex (male)			
Male	146 (52.1%)	141 (51.1%)	0.718
Female	134 (47.9%)	135 (48.9%)	
Timing of home visit during pregnancy			
Gestational age	30.20±3.122		
<28 weeks	117 (46.8%)		
≥28 weeks	133 (53.2%)		

Data are represented in number (n) and (%) percent, mean±SD, (>0.05, non-significant), significant*

Mean gestational age for infants of mothers in the home-visit group was 30.20±3.122 weeks.

Pregnant women who received home visits were more likely to be experiencing their first pregnancy 198 (79.2%), 36 (14.4%) diagnosed with a disease and 113 (45.2%) worried about child-rearing compared with women who

did not receive home visits. Primigravidas received more home visits than multigravidas with p value (<0.001).

Table 2 shows the birth and maternal outcomes. Women from the home-visit group had a heavier birth weight 2752.85±286.571, longer gestational age 38.36±1.257, less LBW infants 52 (18.6%), less preterm birth 22 (7.9%), and less SGA infants 27 (9.6%) compared to participants who did not receive the home-visit program.

DISCUSSION

Maternal mortality may result from pregnancy related adverse outcomes. It has be concluded that about 830 women die daily around the world.[16]

Usage of a home-visit program during pregnancy is a fundamental strategy to prevent adverse birth outcomes. Despite the precise tool of this approach is not well discussed in research work, many authors have suggested that giving intimate psychosocial support, and upgrading communication with health care providers, social services and nutrition support can improve pregnancy outcomes. However, there are conflicting results about pregnancy outcomes from previous randomized controlled trials (RCTs) of home-visit programs.[14,15] Thus, we conducted the present study to evaluate home visits by public health providers in high risk pregnancy and its influence on pregnancy outcomes.

Mean gestational age for infants of mothers in the home-visit group was 30.20±3.122 weeks. Pregnant women who received home visits were more likely to be experiencing their first pregnancy 198 (79.2%), 36 (14.4%) diagnosed with a disease and 113 (45.2%) worried about child-rearing compared with women who did not receive home visits. No statistical difference concerning those variables between both groups.

The results of the present study are compared with the study by Ichikawa et al in which the baseline characteristics of prenatal mothers at pregnancy registration in the home-visit group (n=410) and the no home-visit group (n=554) before propensity-score matching. Mean gestational age for infants of mothers in the home-visit group was 27.2 (SD=6.9) weeks. Pregnant women who received home visits were more likely to be experiencing their first pregnancy (n=333, 81.2%), diagnosed with a disease (n=163, 39.8%), and worried about child-rearing (n=192, 46.8%) or relationships with neighbors (n=64, 15.6%) compared with women who did not receive home visits. Pregnant women who did not receive home visits were more likely to smoke (n=111, 20.0%), drink alcohol (n=67, 12.1%), be unmarried (n=197, 35.6%), feel unhappy about their pregnancy (n = 111, 20.0%), or had partners who were unhappy about their pregnancy (n=85, 15.3%) compared with women in the home-visit group. After performing propensity-score matching with the comparison group, no significant difference was observed between variables.[17]

In spite of national and international follow up of home visits as a procedure to enhance maternal and child health and avoid abuse of mother and her child enhancing well-being of the whole family, previous systemic reviews and studies of home visiting programs which evaluated several outcomes concluded wide range of results according to way of each program and kind of outcome assessed.[18-20]

The present study assessed the birth outcomes among participants and revealed that women from the home-visit group had a heavier birth weight 2752.85±286.571, longer gestational age 38.36±1.257, less LBW infants 52 (18.6%), less preterm birth 22 (7.9%), and less SGA infants 27 (9.6%) compared to participants who did not receive the home-visit program.

In agreement with our findings, the study of Ichikawa et al in which women from the home-visit group had a heavier birth weight (2905.3 g, SD=499.5 g), longer gestational age (38.7 weeks, SD=1.8 weeks), higher ZBW (-0.04, SD=1.1), less LBW infants (n=85, 19.2%), less preterm birth (n=40, 9.8%), and less SGA infants (n=52, 11.7%) compared to participants who did not receive the home-visit program. After propensity-score matching, women from the home-visit group had a heavier birth weight (2933.3 g, SD=473.4 g), longer gestational age (38.6 weeks, SD=1.8 weeks), and less preterm birth (n=34, 10.9%) compared to women who did not receive the home-visit program.[17]

Two recent observational studies by Roman et al and Issel et al were conducted in the United States (US) using propensity score-matched analysis found home-visit programs to be effective. Both US studies concluded that implementing the home-visit program reduced the bad birth outcomes in poor women (i.e. people who received free medical care). Our finding is consistent with these studies in showing the effectiveness of the home-visit program in preventing adverse birth outcomes, although the definition of disadvantaged population is different (i.e. our definition of 'high-risk pregnant women' did not only focus on economic status but on medical conditions, social disadvantages and other factors).[15,21]

In another study by Filene et al who reported that mothers participating in home visiting programs achieved more positive outcomes overall than mothers in control/comparison groups. However, outcome-specific mean effect sizes revealed significant but small effects only on maternal life course, child cognitive outcomes, and parent behaviors and skills. In contrast, home visiting programs did not produce significant average effects on 3 frequent program targets (birth outcomes), suggesting that programs were, on average, not effective in addressing these outcomes. The non-significant effect sizes, combined with the relatively small significant effect sizes, suggest that communities may need complementary or alternative strategies to home visiting programs to have a greater impact on these important public health outcomes.[22]

CONCLUSION

Our findings suggest that home visits by public health nurses for high-risk pregnant women in Egypt might be effective in preventing preterm birth, but not SGA. This study adds to the evidence of the effectiveness of population-based home-visit programs as a public healthcare measure.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Alkema L, Chou D, Hogan D. 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. The Lancet. 2016;387(10017):462-74.
2. Stampalija T, Dowswell T, Alfirevic Z. Fetal and umbilical Doppler ultrasound in highrisk pregnancies. The Cochrane Database of Systematic Reviews. 2017;(6).
3. Lee S, Ayers S, Holden D. Risk perception and choice of place of birth in women with high risk pregnancies: A qualitative study. Midwifery. 2016;38:49-54.
4. Baron IS, Litman FR, Ahronovich MD. Late Preterm Birth: A Review of Medical and Neuropsychological Childhood Outcomes. Neuropsychology Review. 2012;22:438-50.
5. Ichikawa K, Fujiwara T, Nakayama T. Effectiveness of home visits in pregnancy as a public health measure to improve birth outcomes. PloS one. 2015;10(9).
6. Carter EB, Temming LA, Akin J. Group prenatal care compared with traditional prenatal care: a systematic review and meta-analysis. Obstetrics and gynecology. 2016;128(3):551.
7. Montasser NA, Helal RM., Megahed WM. Egyptian women's satisfaction and perception of antenatal care. Int J Trop Dis Health. 2012;2(2):145-56.
8. Kinsey K. Public Health Nursing Health Promotion Strategies: Philadelphia Nurse-Family Partnership and Mabel Morris Family Home Visit Programs. In APHA's 2019 Annual Meeting and Expo (Nov. 2-Nov. 6). American Public Health Association. 2019.
9. Nievar MA, Van Egeren LA, Pollard S. A meta-analysis of home visiting programs: Moderators of improvements in maternal behavior. Infant mental health Journal. 2010;31(5):499-520.
10. Rastegari Z, Yarmohammadian MH, Mohammadi F. A comprehensive home-care program for health promotion of mothers with preeclampsia: protocol for a mixed method study. Reproductive Health. 2019;16(1):32.
11. Guo Y, Rousseau J, Bender M. A Program Model Describing a Community-Based Mother and Infant Health Program. Research and theory for nursing practice. 2019;33(1):39-57.
12. Cullen JP, Ownbey JB, Ownbey MA. The effects of the Healthy Families America home visitation program on parenting attitudes and practices and child social and emotional competence. Child and Adolescent Social Work J. 2010;27(5):335-54.
13. van Noort-van der Spek IL, Franken M, Weisglas-Kuperus N. Language Functions in Preterm-Born Children: A Systematic Review and Meta-analysis. Pediatrics. 2012;129:745-54.
14. Peacock S, Konrad S, Watson E, Nickel D, Muhajarine N. Effectiveness of home visiting programs on child outcomes: a systematic review. BMC Public Health. 2013;13(10).
15. Roman L, Raffo JE, Zhu Q, Meghea CI. A Statewide Medicaid Enhanced Prenatal Care Program Impact on Birth Outcomes. JAMA Pediatrics. 2014;168:220-7.
16. Mohamed EAB, Hamed AF, Yousef FMA. Prevalence, determinants, and outcomes of unintended pregnancy in Sohag district, Egypt. J Egypt Public Health Assoc. 2019;94:14.
17. Ichikawa K, Fujiwara T, Nakayama T. Effectiveness of Home Visits in Pregnancy as a Public Health Measure to Improve Birth Outcomes. PloS one. 2015;10(9):e0137307.
18. Butchart A, Harvey AP, Mian M, Furniss T, Preventing Child Maltreatment: A Guide to Taking Action and Generating Evidence. Geneva, Switzerland: World Health Organization. 2006.
19. Gomby DS. Home Visitation in 2005: Outcomes for Children and Parents. Invest in Kids Working Paper No. 7. Washington, DC: Committee for Economic Development. 2005.
20. Bilukha O, Hahn RA, Crosby A. Task Force on Community Preventive Services, The effectiveness of early childhood home visitation in preventing violence: a systematic review. Am J Prev Med. 2005;28(2 suppl1):11-39.
21. Issel LM, Forrestal SG, Slaughter J, Wiencrot A, Handler A. A Review of Prenatal Home-Visiting Effectiveness for Improving Birth Outcomes. Journal of Obstetric Gynecologic and Neonatal Nursing. 2011;40:157-65.
22. Filene H, Kaminski JW, Valle LA, Cachat P. Components Associated With Home Visiting Program Outcomes: A Meta-analysis. Pediatrics. 2013;132(Supplement 2):S100-9.

Cite this article as: Khalil EM, Abdelgayed SMS, Elbahrawe RS, Abbas AM, Yahia M, Ali HAA. Efficacy of home visits by public health providers for high-risk pregnant women in Egypt. Int J Community Med Public Health 2021;8:2099-103.