Effectiveness of the iParent app for postnatal depression: a randomised controlled trial (abridged secondary publication)

KL Chan *, WC Leung, A Tiwari, KL Or, P Ip

KEY MESSAGES

1. Pregnant women who used the iParent app reported a significantly lower level of postnatal depression than those who received treatment as usual after adjusting for demographic characteristics and baseline depression levels.

2. The iParent app is a low-cost, user-friendly alternative to the traditional, resource-consuming antenatal classes.

[1] KL Chan, [2] WC Leung, [3] A Tiwari, [4] KL Or, [5] P Ip

[1] Department of Applied Social Sciences, The Hong Kong Polytechnic University
[2] Department of Obstetrics and Gynaecology, Kwong Wah Hospital
[3] School of Nursing, Hong Kong Sanatorium and Hospital
[4] Department of Industrial and Manufacturing Systems Engineering, The University of Hong Kong
[5] Department of Paediatrics and Adolescent Medicine, The University of Hong Kong

* Principal applicant and corresponding author: koling.chan@polyu.edu.hk

Introduction

Antenatal depression and postnatal depression (PND) affect maternal and infant health. Effective interventions to reduce the risk of depression related to pregnancy are necessary. Traditional interventions (regular antenatal check-ups and classes and other forms of pregnancy care provided by medical, nursing, or social work professionals) are useful to improve maternal and infant well-being.[1] Yet, these often involve a face-to-face meeting and hence are resource consuming, with limited numbers of recipients at a time.

Mobile health (mHealth) technologies have been widely applied in developed countries to reach out to families with pregnant women. These technologies include regular text messages, emails, platforms or forums for networking and knowledge exchange, and interactive smartphone apps, which may promote a better preparation for parenthood and a greater sense of social support.[2,3] A meta-analysis demonstrated moderate to large effect sizes of mHealth antenatal interventions to improve maternal mental health and physical health.[4] We developed the iParent app to disseminate essential knowledge for pregnancy and infant care to pregnant women. This study aimed to evaluate the effectiveness of the iParent app in reducing maternal PND in pregnant women in Hong Kong.

Methods

This study was a single-blind, prospective, randomised, two-armed (1:1) controlled trial conducted at Kwong Wah Hospital in late 2017 and 2018. First-time pregnant women with <24 weeks' gestation were recruited. Those who were younger than 18 years, unable to understand written Chinese or English, or unwilling to provide informed consent were excluded.

The iParent app comprised two main components: (1) essential materials for pregnancy and infant care in the form of short video clips and brief written passages with pictures, and (2) an interactive platform for pregnant women to seek private advice from obstetricians without time and space constraints. The materials were the same as those distributed in print form during traditional antenatal classes.

A total of 660 pregnant women were assigned at random to the intervention or control group using lots in a ratio of 1:1. Those in the intervention group were given access to the iParent app (with a specific login name and password) in addition to the treatment as usual (antenatal check-ups and the optional face-to-face classes held by midwives). The intervention lasted for about 20 weeks. Prompts were made via emails if the participants did not log in to the app. The control group received treatment as usual.

Participants were assessed at baseline (T1) for antenatal depression and demographic characteristics. Participants were contacted again approximately 4 weeks after childbirth (T2) for assessment of PND.

The primary outcome was the difference between the levels of antenatal depression at T1 and PND at T2. Antenatal and postnatal depressive symptoms were measured using the Chinese version

of the 10-item Edinburgh Postnatal Depression Scale (EPDS).[5] Total scores range from 0 to 30; higher scores indicate more severe depression. The Chinese EPDS has good reliability (Cronbach's alpha=0.84-0.85), Participants' age, education attainment, employment status, marital status, household income, and presence of diagnosed chronic physical and mental health conditions were also recorded.

Intention-to-treat principle was used. Missing data were treated by the last observation carried forward imputation method. To test the effectiveness of the iParent app in reducing depression, analysis of covariance was conducted to compare the differences in EPDS scores between the intervention and the control groups with adjustment of demographic characteristics. All analyses were performed using SPSS (Windows version 24; IBM Corp, Armonk [NY], US), with a significance level of 0.05.

Results

A total of 660 pregnant women (response rate, 82%) completed the T1 baseline survey and were evenly randomised to either the intervention group or the control group. At T2, 218 women in the intervention group and 225 women in the control group completed the follow-up survey (retention rate, 66% and 68%, respectively). No significant differences in demographic characteristics were found between those who completed both T1 and T2 surveys and those who withdrew.

The intervention and control groups were comparable in terms of maternal age (31.3±4.6 vs 31.2±4.5 years), being married or cohabiting with a partner (88% vs 92%), recipient of social security assistance (5% vs 3%), chronic physical health condition (5% vs 7%), and mental illness (1% vs 0%). The intervention group had a significantly greater reduction of EPDS scores (7.3±4.6 vs 7.2±4.6 at T1 and 5.3±4.4 vs 5.9±4.7 at T2, adjusted mean differences= -0.65 [95% confidence interval= -1.29-0.00, $P<0.05$]).

Discussion

After approximately 20 weeks of using the iParent app in addition to the treatment at usual antenatal care services, pregnant women reported a significantly greater reduction in the severity of PND, compared with those with treatment as usual alone. Our findings support the usefulness of the iParent app as a low-cost alternative to traditional face-to-face educational or pregnancy care services. Through the iParent app, pregnant women and their partners could receive essential information about pregnancy and infant care without limitations on time and location. The mobility and portability of the app, together with the enhanced sense of connection with health professionals, might then promote better preparation for parenthood by providing a user-friendly platform to engage pregnant women and their partners.

Conclusion

The iParent app is useful as a low-cost, user-friendly means of antenatal care service.

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Disclosure

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1. Chan KL, Leung WC, Tiwari A, Or KL, Ip P. Using smartphone-based psychoeducation to reduce postnatal depression among first-time mothers: randomised controlled trial. JMIR Mhealth Uhealth 2019;7:e12794.

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