

Usefulness of antenatal care handbook: a cross-sectional study of mothers' perspectives

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Abstract

In 2016, the Ministry of Health Brunei Darussalam introduced the Maternal and Child Health (MCH) Handbook, replacing the card-type record. Despite its implementation, the handbook's utility remains unexamined. This study aims to evaluate the community's usage of the MCH handbook and explore the connections between age, education, and handbook utilization. A cross-sectional study employed an online self-administered survey among pregnant women attending routine antenatal checkups at 32 weeks gestation between December 2020 and January 2021. The survey used the MCH Usefulness Questionnaire, and subgroup analysis was conducted. The study included 73 mothers. Most participants reported having sufficient time to read the handbook (95.9%), being familiar with its content (89.0%), and feeling satisfied with its usage (93.2%). Reasons for not using the handbook included "online availability of the same information" (20.5%), difficulty in understanding certain words (17.8%), preference for more visual content (12.3%), and inadequate encouragement from healthcare providers (12.3%). The majority of mothers perceive the handbook as useful. Nonetheless, further investigation is necessary to delve into their perceptions and ensure the handbook's sustained relevance and effectiveness over time.

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Key words: booklet; cross-sectional study; handbook; maternal and child health; online survey.

Contributions: all authors have made substantial contributions to the conception or design of the study and acquisition, analysis, and/or interpretation of data, participated in drafting or revising the manuscript, approved the version to be published, and agreed to be accountable for all aspects of the work and any issues related to the accuracy or integrity of any part of the work.

Conflict of interest: the authors declare no potential conflict of interest, and all authors confirm accuracy.

Ethics approval and consent to participate: ethical approval obtained from the Joint Research Ethics Committee of Pengiran Anak Puteri Rashidah Sa'adatulk Bolkiah (PAPRSB), Institute of Health Science Research Ethics Committee (IHSREC), (UBD/PAPRSBIHSREC/2020/123) with permission by the Ministry of Health Brunei Darussalam. Participants need to give informed consent by clicking "I agree" before completing the survey.

Availability of data and material: data is available upon reasonable request.

Funding: none.

Acknowledgements: the authors would like to express their utmost gratitude to all participants and nurse managers for supporting this study.

Received: 15 September 2023.

Accepted: 14 November 2023.

Early access: 24 November 2023.

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Healthcare in Low-resource Settings 2024; 12:11813
doi:10.4081/hls.2023.11813

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Introduction

The Maternal and Child Health (MCH) Handbook was first published in Japan in 1948 and has since been developed and adapted in more than 50 countries around the world.¹ In Brunei Darussalam, the use of the MCH Handbook was introduced in January 2016 with the aim of providing health information to help women achieve and maintain optimal health during pregnancy and to assist parents in childcare as a whole.^{2,3} The MCH Handbook has been recognized as an effective tool for improving health knowledge and health-seeking behavior among both mothers and children.⁴ Furthermore, it plays a crucial role in ensuring that no one is left behind in terms of healthcare services.⁵

The MCH Handbook is distributed to all pregnant mothers during their first antenatal visit and serves as a reference guide when needed. It is carried along for any visits to a healthcare facility.⁶ The handbook covers information on maternal health, including during pregnancy, childbirth, and the postpartum period, as well as child health records from birth until the child reaches 5 years of age. It is designed to comprehensively document all information regarding the health services provided to pregnant women and their children, serving as an integrated home-based record.⁷ Additionally, it serves as a starting point for increasing knowledge and promoting healthier healthcare-seeking behaviors and safe home care practices through communication between healthcare professionals and mothers with children. The handbook also includes health education messages to encourage better healthcare-seeking, healthy behaviors, and safe home care practices.⁸ Despite the introduction of the MCH Handbook in Brunei Darussalam, there has been no prior study or investigation to evaluate its usefulness. This has prompted the researcher's interest in conducting a study to assess the handbook's utility among pregnant women in Brunei Darussalam.

Numerous studies have examined the use of the handbook.

For example, in 2015, pregnant women in Indonesia who used the MCH Handbook were more likely to seek medical attention when encountering problems during pregnancy.⁶ Similarly, research conducted in Mongolia showed that the use of the MCH Handbook during pregnancy promotes health-seeking behaviors, resulting in an increase in the number of antenatal visits.⁹ Furthermore, the handbook's utilization among pregnant women has contributed to a more proactive attitude toward health-seeking behaviors.^{10,11} Health-seeking behavior during pregnancy is vital because it leads to better health education. The provision of health education during pregnancy increases pregnant women's awareness of when to seek medical attention, reducing maternal morbidity and mortality.^{12–14}

The significance of this issue becomes even more apparent when considering the potential consequences of neglecting the Antenatal Care Handbook. Inadequate prenatal care can lead to various adverse outcomes, including higher rates of maternal and infant mortality, preterm births, low birth weights, and birth defects.¹⁵ It can also result in missed opportunities for early detection and intervention in maternal health conditions, such as gestational diabetes and hypertension, which can have long-lasting effects on both the mother and the child.¹⁶ Furthermore, the economic burden of complications arising from insufficient prenatal care is substantial, impacting both healthcare systems and families. Therefore, studying the utilization and impact of the Antenatal Care Handbook is of paramount importance, as it has the potential to significantly improve maternal and child health outcomes while reducing the associated societal costs.

In Brunei Darussalam, there is at least one MCH Clinic in each of the 4 districts. These clinics provide antenatal care services, which include routine health monitoring of pregnant women, disease screening, diagnosis, and the provision of information on lifestyle, pregnancy, and delivery.^{17,18} Previous studies have indicated that the MCH Handbook positively influences maternal knowledge and behaviors, ultimately leading to increased antenatal care attendance among pregnant women.¹⁹ Therefore, the purpose of this study was to assess the usefulness of the content of the MCH Handbook in providing information related to antenatal care among pregnant women in Brunei, considering overall and demographic stratification.

Materials and Methods

Study design and setting

A cross-sectional study design was employed, utilizing an online survey administered to all mothers at 32 weeks of pregnancy who attended antenatal visits at major maternal and child clinics in Brunei. Data collection took place between December 2020 and February 2021. The primary objective of this study was to assess the community's utilization of the MCH handbook and investigate potential associations between age, education levels, and the utilization of the MCH handbook.

Sample size

The sample size for this study was determined based on the attendance of women at their first antenatal clinic visit in the year 2019, with a total registered population of 6,403 women nationwide. Using a 95% confidence level and a 5% margin of error, the calculated ideal sample size was 363, as computed with the Qualtrics sample size calculator. To account for potential attrition and non-response bias, a minimum of 380 participants was deemed

necessary. This sample size was also discussed with input from both the statistician and the research team.

Furthermore, six Maternal and Child Health Clinics (MCH) across the country participated in this study. To ensure equitable representation, the minimum required participants were evenly distributed among the designated sites, aligning with the number of first antenatal visit attendances at each clinic in the year 2019.

Data collection procedure

A QR code and a link to the survey were distributed by the gatekeepers and staff of the respective clinics. The survey was provided to 380 participants, all of whom were 32 weeks pregnant and attending the clinic for their routine antenatal care visit. During the recruitment process, certain inclusion criteria were applied: women aged 18 years and above, citizens or permanent residents of Brunei Darussalam, and those capable of reading and accessing the internet. Recruitment and the distribution of the survey link were facilitated by gatekeepers, with these activities occurring during the antenatal clinic sessions at the chosen MCH clinics for the study. All pregnant women at 32 weeks gestation who met the inclusion criteria were invited to participate in the research. The gatekeepers provided a comprehensive overview of the study, and participants were furnished with a handout containing links and a QR code, enabling them to access the online versions of the Participant Information Sheet, consent form, and survey questionnaire.

Survey instrument

The online survey instrument was developed using Qualtrics, and the questionnaire was designed by the researcher and the team. The questionnaires underwent pilot testing with a sample of 5 participants at the Kuala Belait MCH Clinic. Importantly, no alterations or adjustments were deemed necessary for the online survey instrument, as the pilot phase revealed no issues or ambiguities in the research instruments. The questionnaires were available in both English and Malay versions to accommodate participants who did not speak or understand English.

The survey comprises three sections: i) Demographic questions (e.g., age, ethnicity, education level, occupation, and number of pregnancies); ii) Questions related to the participant's opinion of the purpose of the MCH Handbook (e.g., time to read, frequency of reading, familiarity, purpose of the handbook, explanation from healthcare worker on the usage of the handbook, satisfaction, and suggestions); iii) Questions about the usage of the handbook (e.g., the convenience of taking the handbook, reasons for not being interested in reading or using the handbook, preference for using the handbook or smartphone applications, and additional comments about the handbook).

Data analysis

Data regarding MCH service utilization and its relationship with age and education levels were collected through surveys. Subgroup analysis, including the chi-square test, was employed to examine these associations. A value of <0.05 was considered a statistically significant finding.

Results

A total of 73 pregnant women participated in the survey. Below is Table 1, displaying the socio-demographic characteristics of the respondents. The age of pregnant women in this study was categorized into two groups: below and above 30 years old. There was only a small difference between these two categories, with 38

(52.1%) and 35 (47.9%), respectively. Among the pregnant women, 31 (42.5%) had a secondary level of education. The questionnaire also examined the employment status of the sample, revealing that 47 (64.4%) pregnant women were employed. Moreover, 46 (63%) pregnant women had fewer than 3 pregnancies. Table 2 illustrates the results regarding the respondents' ages and their preferences for various factors affecting handbook usage. The results showed that older respondents significantly preferred pictures over words ($p=0.032$). There was only a slight difference in the availability of time for engagement with the handbook among respondents of different age groups. Regarding the frequency of pregnant women reading the handbook, most of them indicated they only read it when necessary, constituting 47.9% of the total respondents. Participants in both age groups reported being moderately familiar with the content of the handbook, with percentages of 47.4% and 62.9%, respectively.

The respondents' educational level was also examined to determine if it was associated with the usage of the MCH handbook in Brunei Darussalam (Table 3). Higher education was significantly associated with seeking information from a website ($p=0.018$), perceiving the handbook as bulky or heavy ($p=0.032$), and being in favor of transitioning the usage of the handbook to smartphone applications ($p=0.041$).

Discussion

This study represents the first attempt to assess the effectiveness of the MCH Handbook among pregnant women in Brunei Darussalam. The findings from this research shed light on several significant factors that have a profound impact on the utilization of the handbook. These factors include age and understanding of the Handbook, trust in the Handbook compared to online resources, the influence of birth age and educational level, considerations regarding Handbook size and potential transition to smartphone applications, the role of healthcare professionals, and the far-reaching policy implications.

Age and understanding of the handbook

One crucial aspect investigated in this study concerns the relationship between age and the understanding of the purposes of the handbook. The results show that respondents under the age of 30 tend to be more aware of the handbook's purpose, which is to find relevant information related to maternal and child health.²⁰ Their proactive approach to seeking reliable information in the handbook reflects health-seeking behavior and self-care practices. Individuals with health-seeking behavior tend to have better control over their health. Failure to actively seek information, as evidenced in women not seeking information about cervical cancer, can result in missed opportunities for early detection and prevention, which highlights the significance of health-seeking behavior.²¹

Trust in the handbook compared to online resources

Furthermore, this study highlights that respondents exhibit a clear preference for the MCH Handbook when seeking relevant information compared to relying on online resources. This preference for the handbook may be rooted in a lack of trust in the reliability of online information. Misleading health-related information on the internet can have severe consequences on individuals' quality of life and increase the risk of mortality.²² Despite this, the growing use of online health information is not seen as a threat to

healthcare professionals but rather as a means to enhance understanding of symptoms and diagnoses. Insecurity and a lack of trust in online information contribute to the choice of using the handbook as a reliable source of information for maternal and child health.²³

The influence of birth age and educational level

Moreover, the study reveals a significant correlation between birth age and educational level among participants and their awareness of the handbook's purpose. Greater awareness translates to a better understanding of how to use the handbook effectively.¹⁰ This increased awareness can lead to an increase in health awareness among pregnant women, thereby promoting health-seeking behavior. Participants with diploma qualifications indicated that they used the handbook to record their pregnancy journey, indicating awareness of the handbook's additional features for interactive and interesting pregnancy tracking.^{24,25}

Implications for handbook size and potential transition to smartphone applications

The size of the handbook significantly influences its utilization. As evidenced in Table 3, the bulkiness and weight of the handbook deter some pregnant women from using it. This finding suggests that future revisions should consider the size, content, and weight of the booklet. Interestingly, although smartphone applications offer advantages such as interactivity, social connectivity, and personalized health tracking, the majority of participants did not support a transition from the handbook to smartphone applications. The study results highlight the need for future handbook revisions to better align with users' preferences.^{26,27} The role of healthcare workers, particularly nurses and midwives in MCH Clinics,

Table 1. Sociodemographic characteristics of participants (n=73).

Sociodemographic characteristics	n	%
Age (years)		
<30	38	52.1
≥30	35	47.9
Location		
Gadong MCH	28	38.4
Kuala Belait MCH	20	27.4
Jubli Perak Sengkurong MCH	11	15.1
Berakas MCH	6	8.2
Tutong MCH	6	8.2
Bangar Temburong MCH	2	2.7
Ethnicity		
Malay	60	82.2
Others	7	9.6
Chinese	5	6.8
Indian	1	1.4
Education level		
Secondary	31	42.5
Diploma	28	38.3
Degree	14	19.2
Primary	0	0
Employed		
Yes	47	64.4
No	26	35.6
Number of pregnancies		
<3	46	63.0
≥3	27	37.0

MCH, Maternal and Child Health.

becomes crucial. Clear and consistent information provided by healthcare professionals before the handbook's usage may enhance its utilization among pregnant women in Brunei Darussalam.^{27,28}

The role of healthcare professionals

Another survey conducted in the United States reported that health applications reduce the burden on primary care, leading to cost reductions and improved quality of care.²⁹ This finding holds particular significance when planning the revision or reconstruction of the MCH handbook to better align with users' needs and interests. Since the findings suggest a preference for the handbook over a smartphone application, healthcare workers, such as nurses and midwives in the MCH Clinic, can enhance their efforts to pro-

vide clear and consistent information before expecting mothers to use the handbook. This approach may promote greater utilization of the handbook among pregnant women in Brunei Darussalam.

The far-reaching policy implications

Based on the compelling outcomes of this study, it is evident that a pressing need exists for policy adjustments aimed at addressing the current shortcomings in the distribution and utilization of antenatal care handbooks. Recognizing the pivotal role these handbooks play in maternal healthcare, policymakers should seriously consider adopting measures to alleviate concerns regarding their perceived bulkiness and weight. By implementing these policy changes, there is a promising opportunity to enhance the overall

Table 2. Factors influencing handbook usage associated with age using chi-square test (n=73).

Factors	Age (years)				Total		p
	<30		≥30		n	%	
	n	%	n	%			
Availability of time for engaging with the handbook	36	51.4	34	48.6	70	100.0	0.626
No responses					3		
Frequency of reading the handbook							0.662
Whenever necessary	17	46.0	18	52.9	35	49.3	
Sometimes	17	46.0	14	41.2	31	43.7	
Always	3	8.0	2	5.9	5	7.0	
No responses					2		
Are you familiar with the content in the MCH Handbook?							0.402
Moderately familiar	18	47.4	22	62.9	40	52.6	
Slightly familiar	14	36.8	11	31.4	25	32.9	
Very familiar	5	13.2	2	5.7	7	12.6	
Not familiar at all	1	2.6	0	0.0	1	1.8	
What is the purpose of the MCH handbook given to you?* (refer to Table 4 for description of each purpose) (Multiple response)							
Purpose 1	3	2.6	4	3.7	7	7.0	0.608
Purpose 2	8	7.0	7	6.5	15	15.0	0.911
Purpose 3	23	20.0	24	22.4	47	47.0	0.473
Purpose 4	24	20.9	23	21.5	47	47.0	0.819
Purpose 5	33	28.7	23	21.5	56	56.0	0.032
Purpose 6	24	20.9	26	24.3	50	50.0	0.306
Did you receive any explanation on how to use the handbook?							0.908
Yes	36	94.7	32	100.0	68	97.1	
No	2	5.3	0	0	2	2.9	
No responses					3		
Satisfied with the information given to you before the usage of the handbook?							0.501
Extremely satisfied	15	39.5	13	37.1	28	38.4	
Slightly satisfied	20	52.6	20	57.1	40	54.8	
Slightly dissatisfied	2	5.3	0	0	2	2.7	
Neither satisfied nor dissatisfied	1	2.6	2	5.7	3	4.1	
Do you find it difficult to take the handbook with you anywhere?							0.632
Yes	4	10.8	3	9.1	7	10.0	
No	33	89.2	30	90.9	63	90.0	
No responses					3		
Reasons why women NOT KEEN to read or use the handbook?* (refer to Table 4 for description of each reason)							
Reason 1	5	12.2	3	11.5	8	11.9	0.530
Reason 2	6	14.6	3	11.5	9	13.4	0.348
Reason 3	9	22.0	4	15.4	13	19.4	0.171
Reason 4	2	4.9	4	15.4	6	9.0	0.337
Reason 5	6	14.6	3	11.5	9	13.4	0.348
Reason 6	10	24.4	5	19.2	15	22.4	0.203
Reason 7	3	7.3	4	15.4	7	10.4	0.608
Usage of Handbook changed to applications from smartphone							0.827
Yes	17	45.9	13	39.4	30	42.9	
No	20	54.1	20	60.6	40	57.1	
No responses					3		

*Participants could list more than one response to this question.

Table 4. The description for each purpose and reason presented in Table 3.

Purpose	Description
1	To write down any clinic appointment
2	To be use by healthcare worker only
3	To be used as reading material to increase health behaviour knowledge
4	To be used as reference when experiencing mild health problems during pregnancy
5	To find relevance information related to mother and child health
6	Can be used to record pregnancy journey
Reason	Description
1	I find it bulky or heavy
2	Less encouragement from the healthcare worker
3	the words used in the handbook are difficult to understand
4	Not interactive
5	I like more pictures than words
6	I can get the same information form website
7	I would like to access the information from my handphone

effectiveness of antenatal care programs, which, in turn, can lead to improved maternal and child health outcomes.

Limitations

The sample size for this study was notably small, with only 73 respondents (19%) out of the 380 targeted participants in the initial proposal. Additionally, several questions in the survey received incomplete responses. Consequently, the findings of this study may not be broadly applicable to the population of mothers in Brunei Darussalam. Further studies are warranted to gain a deeper understanding of the usefulness of antenatal care handbooks. Given the inherent limitations of online surveys, ensuring the sample's representativeness of the target population posed a challenge. To mitigate potential biases, the survey introduction emphasized the study's significance and stressed the importance of providing thoughtful, undistracted responses.

Conclusions

This study marks the first of its kind in Brunei Darussalam since the introduction of the handbook in 2016. The findings of this study provide initial insights into the functionality and utilization of this handbook among pregnant mothers. Understanding the purpose of the handbook can potentially enhance health behaviors among women who make use of it. Despite the ease of accessing information related to maternal and child health through smartphones and other smart devices, the utilization of the handbook remains a viable choice among respondents. It is our hope that the results of this study will serve as a foundation for future, more comprehensive investigations into the effectiveness of this handbook's usage.

References

1. Nakamura Y. The role of maternal and child health (MCH) handbook in the era of sustainable development goals (SDGs). *J Glob Heal Sci* 2019;1(1).
2. Widiarti N, Suryawan A, Irmawati M. Validity test of pre-screening developmental questionnaire (PDQ) and mother and child health (MCH) handbook for determining children's readiness to enter elementary school. *Bali Med J* 2023;12:211-7.
3. Utami S, Susilaningrum R, Nursalam. The effect of health promotion based on the health promotion model with a peer group approach regarding the utilization of maternal and child health handbook. *Indian J Public Heal Res Dev* 2019;10:1987-92.
4. Kawakatsu Y, Sugishita T, Oruenjo K, et al. Effectiveness of and factors related to possession of a mother and child health handbook: an analysis using propensity score matching. *Health Educ Res* 2015;30:935-46.
5. WMA - The World Medical Association. WMA Statement on the Development and Promotion of a Maternal and Child Health Handbook. 2021.
6. Osaki K, Kosen S, Indriasih E, et al. Factors affecting the utilisation of maternal, newborn, and child health services in Indonesia: the role of the Maternal and Child Health Handbook. *Public Health* 2015;129:582-6.
7. Balogun OO, Tomo CK, Mochida K, et al. Impact of the Maternal and Child Health handbook in Angola for improving continuum of care and other maternal and child health indicators: study protocol for a cluster randomised controlled trial. *Trials* 2020;21:1-16.
8. Magwood O, Kpadé V, Thavorn K, et al. Effectiveness of home-based records on maternal, newborn and child health outcomes: A systematic review and meta-analysis. *PLoS One* 2019;14:e0209278.
9. Mori R, Yonemoto N, Noma H, et al. The maternal and child health (MCH) handbook in Mongolia: a cluster-randomized, controlled trial. *PLoS One* 2015;10:e0119772.
10. Aiga H, Nguyen VD, Nguyen CD, et al. Knowledge, attitude and practices: assessing maternal and child health care handbook intervention in Vietnam. *BMC Public Health* 2015;16:1-10.
11. Sudaryanti L, Mardhika A, Qona'Ah A, et al. Antenatal care of pregnant women during pandemic: A phenomenology study. *J Pak Med Assoc* 2023;73:S71-5.
12. Gopalakrishnan S, Eashwar VMA, Muthulakshmi M. Health-

- seeking behaviour among antenatal and postnatal rural women in Kancheepuram District of Tamil Nadu: A cross-sectional Study. *J Fam Med Prim Care* 2019;8:1035.
13. Istifa MN, Efendi F, Wahyuni ED, et al. Analysis of antenatal care, intranatal care and postnatal care utilization: Findings from the 2017 Indonesian Demographic and Health Survey. *PLoS One* 2021;16:e0258340.
 14. Triharini M, Sulistyono A, Adriani M, Devy SR. The Effect of Health Promotion Intervention on Anemia Prevention Behavior and Haemoglobin Level in Pregnant Women: Based on Health Promotion Model and Self-Determination Theory. *J Ners* 2019;14:92-100.
 15. Debessai Y, Costanian C, Roy M, et al. Inadequate prenatal care use among Canadian mothers: findings from the Maternity Experiences Survey. *J Perinatol Off J Calif Perinat Assoc* 2016;36:420-6.
 16. Moniz MH, Fendrick AM, Kolenic GE, et al. Out-Of-Pocket Spending For Maternity Care Among Women With Employer-Based Insurance, 2008-15. *Health Aff (Millwood)* 2020;39:18-23.
 17. Sebayang SK, Efendi F, Astutik E. Women's empowerment and the use of antenatal care services: analysis of demographic health surveys in five Southeast Asian countries. *Women Heal* 2019;59:1155-71.
 18. Yunitasari E, Putri DUW, Armini NKA, et al. Analysis of factors that affect the utilization of antenatal care in developing countries: A systematic review. *J Pak Med Assoc* 2023;73:S162-9.
 19. Yanagisawa S, Soyano A, Igarashi H, et al. Effect of a maternal and child health handbook on maternal knowledge and behaviour: a community-based controlled trial in rural Cambodia. *Health Policy Plan* 2015;30:1184-92.
 20. Khasanah U, Efendi F, Has EMM, et al. Healthcare-seeking behavior for children aged 0-59 months: Evidence from 2002-2017 Indonesia Demographic and Health Surveys. *PLoS One* 2023;18:e0281543.
 21. Habtu Y, Yohannes S, Laelago T. Health seeking behavior and its determinants for cervical cancer among women of child-bearing age in Hossana Town, Hadiya zone, Southern Ethiopia: community based cross sectional study. *BMC Cancer* 2018;18:1-9.
 22. Swire-Thompson B, Lazer D. Public health and online misinformation: challenges and recommendations. *Annu Rev Public Health* 2020;41:433-51.
 23. Van Riel N, Auwerx K, Debbaut P, et al. The effect of Dr Google on doctor-patient encounters in primary care: a quantitative, observational, cross-sectional study. *BJGP Open* 2017;1(2).
 24. Mardiyanti I, Devy SR, Ernawati E. Analysis of Sociodemographic and Information Factors on Family Behaviour in Early Detection of High-Risk Pregnancy. *J Ners* 2019;14:144-50.
 25. Ainiyah NH. The use of Maternal and Child Health (MCH) handbook improves healthy behavior of pregnant women. *Maj Obstet Ginekol* 2017;25:58-62.
 26. Tang J, Abraham C, Stamp E, Greaves C. How can weight-loss app designers' best engage and support users? A qualitative investigation. *Br J Health Psychol* 2015;20:151-71.
 27. Lim S, Xue L, Yen CC, et al. A study on Singaporean women's acceptance of using mobile phones to seek health information. *Int J Med Inform* 2011;80:e189-202.
 28. Mahmood A, Kedia S, Wyant DK, et al. Use of mobile health applications for health-promoting behavior among individuals with chronic medical conditions. *Digit Heal* 2019;5:2055207619882181.
 29. Bhuyan SS, Lu N, Chandak A, et al. Use of mobile health applications for health-seeking behavior among US adults. *J Med Syst* 2016;40:153.