

Babeş-Bolyai University

College of Political, Administrative and Communication Sciences

Doctoral School of Administration and Public Policies

**EVALUATING THE IMPLEMENTATION AND IMPACT OF AN MHEALTH  
INTERVENTION ON POSTPARTUM SMOKING CESSATION, DYADIC SUPPORT,  
AND PERCEIVED STRESS IN CLUJ-NAPOCA, ROMANIA**

Thesis Summary

Supervisor:

Prof. Dr. Răzvan M. Cherecheş

Doctoral student:

Andreea Hoştină (Rusu)

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## KEYWORDS

postpartum; smoking cessation; Romania; maternal and child health; mHealth; SMS-based intervention; RCT; mobile app; dyadic efficacy

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## SUMMARY

**Chapter I.** Maternal smoking during pregnancy is a critical public health concern with serious implications for both mother and fetus. Despite efforts to encourage smoking cessation during pregnancy, many women relapse postpartum, especially within the first three months. This study focuses on this pivotal postpartum period, using mobile health (mHealth) interventions in Romania, such as the iCoach app enhanced with Motivation and Problem Solving (MAPS) content. By fostering collective efficacy and leveraging widespread mobile phone usage, the study aims to prevent postpartum smoking relapse and improve maternal and infant health outcomes. The findings could significantly influence public health policies and interventions tailored to Romania's socio-economic context, promoting a healthier future for mothers and infants.

**Chapter II.** The literature review of this thesis explores the effects of smoking on maternal and child health, emphasizing its severe public health risks, including respiratory infections, developmental issues, and increased infant mortality. Eastern European pregnant women, particularly in Romania, have higher smoking rates. The review highlights the urgent need for targeted interventions, noting that many cessation programs have limited long-term effectiveness. Mobile health (mHealth) interventions, especially culturally adapted ones like iCoach with MAPS content, show promise in reducing postpartum smoking relapse. The chapter also discusses the role of social networks and partners in supporting smoking cessation, as well as the impact of maternal smoking on fetal development and children's health. Lastly, it covers legislative efforts and the importance of e-health and m-health initiatives in Romania to improve smoking cessation outcomes.

**Chapter III.** This chapter explores the critical issue of smoking during and around pregnancy, with a particular focus on the high relapse rate postpartum, which poses significant health risks to both mothers and infants. Despite these risks, there is a notable scarcity of tailored smoking cessation programs in Romania and other low and middle-income countries (LMICs), leaving a substantial gap in support for postpartum women. The study introduces the innovative Stay Quit Together program, an intervention that combines the iCoach mobile application and SMS messages, specifically tailored for postpartum women and their partners to prevent smoking relapse.

The program's development was informed by interviews conducted with 12 postpartum women in Cluj-Napoca, Romania, who had quit smoking before or during pregnancy. These semi-structured interviews provided valuable feedback on the program's components, including the usability of the iCoach app and the relevance of the SMS messages. The majority of participants responded positively, finding the app's features, such as daily tips and the panic button, particularly helpful in maintaining smoking cessation. Additionally, the SMS messages were generally well-received, though some women emphasized that the decision to remain smoke-free is ultimately a personal one, not easily influenced by external interventions.

The findings from this part of the study suggest that the Stay Quit Together intervention could be a promising tool for preventing postpartum smoking relapse by leveraging mHealth solutions that are responsive to the specific needs and preferences of the users. The chapter highlights the importance of co-designing health interventions with the target population to enhance their acceptability, effectiveness, and potential for broader implementation in LMICs, where tailored support for smoking cessation is urgently needed.

**Chapter IV** details the use of the TextIt platform in a randomized controlled trial (RCT) aimed at preventing postpartum smoking relapse in Romania, a context where traditional smoking cessation programs are limited. The platform was chosen for its high accessibility, ease of use, and extensive customization options, which allowed for the development of a comprehensive and tailored intervention. The intervention involved sending over 2,100 personalized motivational SMS messages to postpartum women and their partners, addressing critical factors such as motivation, confidence, and coping mechanisms.

Although the initial setup of the platform was time-intensive—requiring over 200 hours to upload and organize the messages—the effort resulted in a highly efficient and automated system that required minimal further interaction from the research team. The platform's features, including its ability to deliver both automated and interactive SMSs, provide real-time analytics, and operate at relatively low costs, proved to be highly effective in maintaining participant engagement and supporting smoking cessation.

This chapter emphasizes the potential of SMS-based interventions, particularly in low-and-middle-income countries where resources are often limited, and traditional healthcare services may not be easily accessible. The study highlights how such technology can be leveraged to provide continuous, personalized support to individuals, making it a valuable tool for public health interventions aimed at reducing smoking relapse postpartum. The success of this platform in the Romanian context suggests that similar approaches could be applied in other settings, offering a scalable and cost-effective solution to smoking cessation and other health behavior change interventions.



**Chapter V** details a randomized controlled trial (RCT) conducted from March 2017 to December 2019 to assess the effectiveness of smoking cessation interventions among postpartum mothers and their partners in Romania. The participants, comprising 75 couples, were divided into three groups: a control group, a group using the xSmoker app, and a group using both the xSmoker app and receiving additional SMS support. The trial was conducted in two clinics in Cluj-Napoca, with interventions administered over a six-week postpartum period and follow-up assessments conducted at six months.

The study employed robust methodologies, including randomization and the use of validated psychological scales to measure outcomes such as perceived stress, which is a critical factor in smoking relapse. The results indicated that in the intervention groups, patient health (specifically depression and anxiety levels) and negative partner interactions were significant predictors of perceived stress. This finding highlights the crucial role that mental health and relationship dynamics play in postpartum smoking cessation.

While the xSmoker app and SMS interventions showed promise in reducing stress and potentially preventing smoking relapse, the effectiveness varied across different predictor variables. Dyadic efficacy (the couple's ability to work together) and positive partner interactions, although not statistically significant, appeared to contribute to lower stress levels, suggesting areas for further investigation in future interventions. The study's findings underscore the potential of mHealth tools like the xSmoker app and SMS messages to support smoking cessation efforts in postpartum women, particularly in low-and-middle-income country settings where traditional support may be limited.

## **Conclusions**

*Contribution to Existing Knowledge and Literature.* The results of this study align with previous research but stand out due to its use of the Motivation and Problem Solving (MAPS) method via SMS, a relatively unexplored approach. The study underscores the potential of mHealth interventions in improving maternal and infant health by offering continuous support. It advocates for the integration of mHealth tools into standard postpartum care, highlighting their accessibility and effectiveness, particularly in under-served populations. Additionally, the study's adaptation of the iCoach mobile app for the Romanian context and its focus on involving both women and their partners in the intervention are notable contributions.

*Influence on Public Policies and Social Changes.* This study suggests that digital tools could be integrated into national healthcare systems, supported by appropriate training for healthcare providers and funding for preventive programs. Socially, the study's findings could lead to improved maternal and child health, reduced healthcare costs, healthier family environments, and greater public awareness of the dangers of postpartum smoking. Targeted support for vulnerable populations could also help reduce health disparities.

*Study Limitations.* The study's limitations include a small sample size, which may affect the applicability of the findings to a broader population, and a short follow-up duration, which might not fully capture long-term effects. The mode of intervention delivery might have impacted user engagement, and the absence of a priori power analysis may have led to an insufficient sample size. Addressing these limitations in future research could improve the reliability and effectiveness of postpartum smoking cessation interventions.