Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Self-Efficacy and Wellbeing as Pathways to Family Planning Decision-Making among Syrian Refugee Women and Girls in a Conflict Setting: Mechanisms of Change from the Integrated SEEK Randomized Controlled Trial in Lebanon

Hady Naal
Global Health Institute at American University of Beirut
Zahraa Chamseddine
Global Health Institute at American University of Beirut
Asmaa El Dakdouki
Global Health Institute at American University of Beirut
Rawad Malaeb
Global Health Institute at American University of Beirut
Hani Tamim
King Al Faisal University
Tania Bosqui
American University of Beirut
Gladys Honein Abou-Haidar
Hariri School of Nursing at American University of Beirut
Veloshnee Govender
Human Reproduction Programme at World Health Organization
Fouad Fouad
American University of Beirut
Randa Hamadeh
Ministry of Public Health
Shadi Saleh
ss117@aub.edu.lb

American University of Beirut

Research Article

Keywords: Mediation analysis, Evaluation, Refugee, Community-based, Trial, Lebanon, War, Conflict, integrated mental health, sexual reproductive health, family planning

Posted Date: November 24th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11623651/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Self-Efficacy and Wellbeing as Pathways to Family Planning Decision-Making among Syrian Refugee Women and Girls in a Conflict Setting: Mechanisms of Change from the Integrated SEEK Randomized Controlled Trial in Lebanon

Hady Naal 1, Zahraa Chamseddine 1, Asmaa El Dakdouki 1, Rawad Malaeb 1, Hani Tamim 2,3, Tania Bosqui 4,5, Gladys Honein Abi-Haidar 6, Veloshnee Govender 7, Fouad Fouad 8,9, Randa Hamadeh 10, Shadi Saleh 1,11 (corresponding author) *

Corresponding Author:

Shadi Saleh, PhD, MPH

Professor and Founding Director

Global Health Institute at American University of Beirut

Beirut, Lebanon

ss117@aub.edu.lb

1- Global Health Institute at American University of Beirut, Beirut, Lebanon
2- College of Medicine, King Al Faisal University, Riyad, Saudi Arabia
3- Department of Internal Medicine, Clinical Research Institute at American University of Beirut, Beirut, Lebanon
4- Department of Psychology at American University of Beirut, Beirut, Lebanon
5- Trinity Center for Global Health, Trinity College Dublin, Dublin, Ireland
6- Hariri School of Nursing at American University of Beirut, Beirut, Lebanon
7- Department of Sexual and Reproductive Health and Research, Human Reproduction Programme at World Health Organization, Geneva, Switzerland
8- Department of Health Policy and Management at American University of Beirut, Beirut, Lebanon
9- Department of International Public Health, at Liverpool School of Tropical Medicine, Liverpool, United Kingdom

10- Department of Primary Health at the Ministry of Public Health, Beirut, Lebanon
11- Faculty of Health Sciences at American University of Beirut, Beirut, Lebanon

Abstract

Background: Sexual and Reproductive Health (SRH), including Family Planning (FP), continue to be major challenges for refugee women and girls in conflict settings. Although psychosocial factors influence SRH and FP outcomes, little is known about the mechanisms through which integrated SRH/PS interventions influence them. This study examined whether psychosocial factors mediated the relationship between exposure to the SRH and psychosocial integrated intervention and FP-related outcomes, specifically FP decision-making.

Methods: The Self-Efficacy and Knowledge (SEEK) Randomized Controlled Trial (RCT) was a single-blind trial conducted in Lebanon in 2024. Eligible participants were married and non-pregnant refugee girls and young women aged 15 to 24. Psychosocial variables and FP-related decision-making were assessed at baseline (t0), endline (t1), and 3-months post-intervention (t2). Mediation analyses were conducted using PROCESS. The main serial mediation model examined improvements in self-efficacy and wellbeing at T1 as sequential mediators for the relationship between exposure to the intervention and improvements in FP-related decision-making at T2.

Results: 477 participants were randomized to either experimental or controlled groups. Parallel mediation demonstrated that improvements in wellbeing at T1 significantly mediated the association between exposure and FP-related decision-making at T2 (indirect effect=0.215;CI=0.029-0.501), contrary to other psychosocial variables. Ad-hoc analyses demonstrated that among all psychosocial variables, only self-efficacy mediated improvements in wellbeing (indirect effect=0.963;CI=0.298-1.864). The primary serial mediation model confirmed a significant pathway whereby intervention exposure improved self-efficacy, which enhanced wellbeing, ultimately improving FP-related decision-making (indirect effect =0.054;CI=0.005-0.137). The direct effect of the intervention however on FP-related decision-making was negative (direct effect=-0.671;$p<0.05$) suggesting that without improvements in self-efficacy and wellbeing, exposure alone may initially heighten tensions around SRH and FP topics. However, when self-efficacy and wellbeing are included in the model, the relationship between intervention exposure and FP-decision led to significant improvements over time.

Conclusion: This study provides new mechanistic evidence from an RCT conducted during active war, demonstrating that self-efficacy and wellbeing are key pathways through which SEEK, an integrated PSS-SRH intervention improves FP-related decision-making among refugee women and girls in Lebanon. The findings highlight the need to strengthen psychosocial components within SRH intervention to better translate psychosocial gains into FP-related behavioral outcome in humanitarian settings.

Key Words: Mediation analysis, Evaluation, Refugee, Community-based, Trial, Lebanon, War, Conflict, integrated mental health, sexual reproductive health, family planning

Trial Registration: Clinical Trial Number NCT07008950 initial release on February 28th 2025 and last release on June 5th 2025 with the clinical trial registry at National Institute of Health (NIH) protocol registration system.

Sources of Funding: This trial was funded by ELRHA and partially by the World Health Organization.

Disclaimer for WHO Staff:

The named authors alone are responsible for the views expressed in this publication and do not necessarily represent the decisions or the policies of the UNDP/UNFPA/UNICEF/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP) or the World Health Organization (WHO).

Funding Attribution:

This work received funding from ELRHA and the UNDP/UNFPA/UNICEF/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP), a cosponsored program executed by the World Health Organization (WHO)

Declarations

1. Ethics Approval & Consent to Participate: This study was approved by the Institutional Review Board at the American University of Beirut and by the Ethics Review Committee at the World Health Organization. All participants provided informed written consent prior to participation. For participants under 18, their parents or guardians were required to sign an informed consent form on their behalf.

2. **Consent for Publication**: Not Applicable

3. Availability of Data and Materials: The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

4. Competing Interests: The authors declare that they have no competing interests

5. Funding: This work was financially support by ELRHA who had no role in the design, data collection, analysis, interpretation, or writing of this manuscript. This work was also partially supported by the World Health Organization.

6. Author Contributions: SS, HN, AED, and VG conceived the study; HN, AED, and ZC drafted the manuscript. ZC and HT led on data management. HN, VG, AED, HT, RM, and ZC led on data analysis. GHA, TB, FF, RM, RH supported in interpretation of the results and wrote different sections of the manuscript. All authors critically reviewed and approved the final version of the manuscript.

7. Acknowledgments: None

1. Introduction

Sexual and Reproductive Health (SRH) challenges remain among the most pressing concerns in conflict-affected settings, with displaced populations being disproportionately affected when compared to the general public (1). Although SRH is primarily recognized as a critical component of health and wellbeing, it is often overlooked in many parts of the world, especially in Low-and Middle-Income Countries (LMICs) and humanitarian settings, especially for Adolescent Girls and Young Women (AGYW) (2-5). In these contexts, AGYW are at higher risk of Sexual Gender-Based Violence (SGBV), unprotected sex and unintended pregnancies which in turn are linked to poorer SRH outcomes, including pregnancy complications(6, 7), exacerbated by limited access to SRH services (8).

Family Planning (FP), a critical component of SRH services (9), plays a pivotal role in reducing maternal mortality by preventing high-risk pregnancies, and reducing the number of births (10). It enables individuals to make informed decisions about pregnancy, reproduction, and sexual activity (11). Globally, it is estimated that FP could prevent a third of the 300,000 annual maternal deaths, 19 million unsafe abortions, and ensure the survival of 1.6 million children below 5 years old (12-15). Despite these benefits, access to FP is hindered by health system barriers and availability of FP services, religious and cultural beliefs, family pressure for childbearing, sociodemographic factors, limited knowledge and unfavorable attitude towards FP, and stigma. Psychological and mental health barriers also play a role, alongside women's low self-efficacy in negotiating use of contraception, and male partners control over reproductive decisions (5, 16-20).

These global challenges are especially evident in Lebanon, which continues to host the highest number of refugees per capita, with an estimated 1.5 million Syrian refugees (21). The ongoing economic crisis has deepened vulnerabilities among both Lebanese and refugee populations (21). Syrian refugees, in particular, face significant hardship, with 9 out of 10 Syrian refugees depending on humanitarian aid to meet their basic survival needs (21), including access to FP services (22). A recent study showed that only 40% of Syrian refugees currently use FP (22), a figure shaped by limited knowledge, fear of discrimination, and financial constraints(23-26). Moreover, mental health conditions such as anxiety, depression and traumatic stress, well-documented among Syrian refugees in Lebanon, exacerbate these challenges by influencing FP uptake and method choice as a result of reduced decision-making ability among others (5, 27-32).

Given these interrelated social, psychological, and mental health challenges influencing SRH and FP behaviors, incorporating a psychosocial component within SRH interventions is likely to strengthen their effectiveness, particularly in improving use of SRH services (5). Psychosocial factors refer to the features or conditions that affect individuals through psychological and social mechanisms (33), which help explain health behaviors (34, 35). These factors include social support, coping ability (33), self-efficacy (36), emotion regulation, communication skills, and problem-solving, among others (37,5).

While evidence highlights the potential role of psychosocial factors in influencing SRH outcomes, interventions that combine both psychosocial and SRH components remain scarce, and the mechanisms linking psychosocial improvements to SRH and FP outcomes are largely unexplored (5). To address this gap, the World Health Organization (WHO) developed the Self-Efficacy and Knowledge (SEEK) intervention, which is a low-intensity, low-resource, integrated package combining Psychosocial Support (PSS) and SRH education. Delivered by trained paraprofessionals, SEEK primarily aims at enhancing self-efficacy in SRH, FP, and MH topics to improve the well-being of AGYW and their FP uptake in humanitarian

settings (38). The present study aims to assess whether psychosocial factors mediate the relationship between participation in the SEEK intervention and FP outcomes among Syrian AGYW refugees aged 15-24 years in Lebanon as key mechanisms of change. By identifying this pathway, this study seeks to generate evidence to refine and strengthen such programs in humanitarian settings.

2. Methods

2.1 Study Design

This study used data from the Self-Efficacy and Knowledge (SEEK) project, a single-blinded, community-based randomized controlled trial (RCT), designed to assess an integrated PSS-SRH WHO package among Syrian AGYW refugees aged 15-24 years in Lebanon. Participants (n=477) who completed baseline data collection were randomized to either an experimental group (EG, n=200), which received the intervention, or a waitlist control group (CG, n=200) that did not receive it during the study period. The remaining participants (n=85) were randomly excluded from the control and experimental arm because the group allocation for the intervention could not allow for more than 200 participants. Although a total of 140 participants were required to be allocated for each group, we recruited additional individuals to allow for potential added attrition, since the PHC space allowed for recruited additional participants. This study adheres to CONSORT guidelines, with details regarding participant flow during the intervention and data collection time periods are reported in the diagram in figure 1, and a completed consort checklist is available as a supplementary file with the submission.

[insert figure 1]

Data collectors were blinded to participant allocation by not being informed whether participants completing surveys were part of the experimental or control group, whereas participants were not because the experimental group was aware of their assignment. FP use and attitudes towards FP, along with psychosocial variables (e.g., coping, social support, emotional regulation, communication, and self-efficacy), were evaluated at baseline (T0, November 2023), immediately post-intervention (T1, December 2024), and at a three-month follow-up (T2, March-May 2024). The present study applied path analysis to assess whether psychosocial variables mediated the relationship between intervention and FP outcomes.

2.2 Study Settings

The study was implemented in the Beqaa region of Lebanon, which hosts the highest proportion of Syrian refugees, accounting for approximately 39% of the total refugee population in the country (39, 40). In line with the project's broader objectives, the selection of primary health care centers (PHCs) was guided by the Ministry of Public Health's (MOPH) recommendations in Lebanon. Following comprehensive field visits, the research team identified two PHCs that met the predetermined eligibility criteria for inclusion in the trial.

2.3 Study participants

The study targeted Syrian AGYW refugees (aged 15-24 years) who had been residing in Lebanon for at least 6 months. Eligibility required that participants be married, not currently pregnant or lactating, free of chronic health conditions that might hinder study adherence, and not be undergoing specialized mental health treatment. Additionally, participants had to express willingness to enroll in the study. Participants who did not meet these criteria during the screening were excluded. Sample size calculation was done

based an expected 20% improvement in FP uptake at T2 from an assumed baseline of 30%. A sample size of 380 participants was calculated to allow 90% statistical power to detect a difference of 20% in FP use at T2 using a two-sided 5% significance level, and allowing for 30% attrition.

2.4 Intervention

The WHO integrated PSS-SRH package focused on educational and skills-building components, including SRH education, psychoeducation, and skills development in domains such as emotion regulation, communication, problem management, decision-making, and self-efficacy. It was delivered through eight weekly in-person sessions, each lasting 90 minutes and conducted in Arabic. Participants in the EG were organized into 16 subgroups, with eight subgroups assigned per PHC. Two sessions were held daily at each PHC, one in the morning and one in the afternoon, allowing each center to conduct up to eight sessions per week. Trained community-based paraprofessionals, with a minimum of 12 years of formal education, facilitated the sessions. A multimodal approach was employed, incorporating PowerPoint presentations, interactive lectures, discussions, case studies, contextually relevant practical activities, and homework assignments. The control group did not receive any intervention during the study period but was waitlisted to receive the program after the T2 assessment. Syrian refugee women and girls from targeted communities were involved in early participatory co-design and intervention development and were involved in interpretation and validation of findings during analysis. Also, paraprofessionals from the targeted communities were involved in the delivery of the intervention.

Notably, the intervention was conducted during active war in Lebanon. This led to a disruption of the intervention, caused delays, and increased the attrition rate.

Detailed information about the intervention implementation and content is documented in a separate manuscript currently under review (41).

[Insert table 1]

Table 1. Intervention content of the SEEK integrated package (taken from Saleh et al (41)).

Session Number	Content Covered
Session 1: Introduction and Emotion Regulation Skills	-Introducing the participants to one another and providing an overview of the program. -Establishing group guidelines to create a safe environment. -Education on recognizing emotions and articulating feelings. -Teaching grounding exercise for managing intense emotions and distress.
Session 2: Linking Actions and Feelings	-Engaging participants in discussion regarding their personal strengths and how these strengths might be related to SRH. -Education on the role of social support and self-care in enhancing feelings and providing strategies to strengthen social support.
Session 3: Communication	-Introducing effective communication to learn different types of communication and differentiate between them.

and Assertiveness Skills	-Providing information on accessible health services and using assertiveness to overcome barriers to healthcare access.
Session 4: Family Planning and Contraception	-Education about reproductive systems and building sexual self-efficacy. -Understanding effective contraceptive methods and distinguishing between facts and myths. -Building communication skills with family members.
Session 5: Contraception for Health and Problem-Solving Skills	-Learning about STIs and protection methods. -Developing problem-solving skills and applying it to SRH concerns.
Session 6: Problem-Solving and Gender Norms	-Practicing problem-solving skills for health protection. -Understanding gender norms, healthy and unhealthy relationships and violence types.
Session 7: Consolidating Skills and Contraception Action Planning	-Adopting assertive communication techniques to handle conflicts in relationships, and reinforcing skills learned from previous sessions. -Learning about the pressure line and how to negotiate. -Use of contraception and steps for contraception action planning.
Session 8: Skills Practice and Closing	-Learning to create an action plan for contraception and reinforcing skills acquired from previous sessions.

2.5 Procedures

The target population was recruited in collaboration with selected PHCs through their patient database, based on predefined eligibility criteria. PHC staff contacted potential participants (or their legal guardians if under 18 years old) over the phone, using a standardized invitation script to schedule visit for screening and data collection. Research assistants provided logistical support, particularly in coordinating appointments and follow-up. Invited participants underwent screening and, if deemed eligible, completed the baseline assessment (T0), which was conducted between November and December 2023. To enhance enrollment, participants were provided with optional obstetric and gynecological (OBGYN) consultations, women's hygiene kits, and transportation incentives. Eligible participants completed the T0 assessment at the selected PHCs. Written informed consent was obtained from participants aged 18 years and above, while assent and parental or guardian consent was secured for minors. Following T0 assessment, participants were randomly assigned to either the experimental group (EG), which received the intervention, or the control group (CG), which did not. Randomization was conducted by the study statistician using a computer-generated randomization scheme and was stratified by the recruitment site

to ensure balanced allocation between groups. Group assignment was conducted by central research staff not involved in participant recruitment or intervention delivery to ensure allocation concealment.

Due to unexpected logistical challenges, a delay occurred between T0 assessment and the onset of the intervention. The intervention ultimately began in early September 2024 but was interrupted by regional conflict and concluded in December 2024. At the end of the study, handouts were left at the respective PHC centers. In accordance with ethical guidelines, the intervention package was offered to control group participants after completion of the T2 assessment.

2.7 Data Collection Tools and Measurements

Baseline, endline, and post-three-month data were collected via Arabic-language surveys using Kobo Toolbox. Eight validated tools were used to assess the study variables.

FP Outcomes

Outcomes related to FP were evaluated using the Pan Arab Project for Family Health (PAPFAM) survey. PAPFAM is a validated tool designed to measure FP and SRH in Arabic countries. It facilitates the collection of comprehensive data on maternal, reproductive, child, adolescent, and elderly health (42). The tool was initially developed and validated in Arabic and then translated into English (43). For this study, the research team selected four sections from the original tool for the baseline survey: (1) participants' sociodemographic characteristics and marital history, (2) pregnancy and reproduction, (3) FP and (4) sexually transmitted diseases (STDs). The sociodemographic and marital history section was excluded at the endline and post-three-month.

Psychosocial factors and mental health outcomes

- Quality of life was assessed with the World Health Organization Well-Being 5-item Index (WHO-5), a brief screening tool for psychological well-being. The tool consists of 5 positive items, each utilizing a 6-point Likert Scale (0 = at no time to 5 = all of the time). The total score spans from 0 to 25, with a cut-off score below 13 indicating low mood or poor well-being. The WHO-5 has been translated and validated in Arabic (44).

- Self-efficacy was assessed using the General Self-Efficacy Scale (GSES), a 10-item instrument designed to capture optimistic self-beliefs about one's ability to manage life's demands (45) (46). The tool has been translated into Arabic and validated for use in the region (45, 46). It has been used in numerous studies and has been validated as a unidimensional construct for adults and adolescents in several single- and multi-country studies. The GSES is scored on a 4-point scale (1 = not at all true and 4 = exactly true), with a total score spanning from 10 to 40. Lower scores indicate lower self-efficacy (47). The score is not dichotomized but may be used for comparative purposes.

- Common mental distress was measured using the Hopkins Symptom Checklist 25 (HSCL-25), which includes 15 items assessing depression and 10 items assessing anxiety (10 items) (48, 49) on a 4-point scale (1 = not at all to 4 = extremely) (48). Scores are calculated by averaging the anxiety and depression items, with a total score derived from the mean of all 25 items (50). An

average score at or above 1.75 indicates concerning symptoms of anxiety or depression. The HSCL-25 has been translated into Arabic and validated for use in the region (51).

- Social support was determined using the Multidimensional Scale of Perceived Social Support for Arab Women (MSPSS-AW), a 12-item scale that examines social support from family, friends, and significant others (52). Each source of support constitutes a subscale with 4 items (52). These items range from 1 (very strongly disagree) to 7 (very strongly agree), with higher subscale scores indicating higher perceived adequacy of social support from each source (52). The MSPSS-AW tool has been translated and adapted to Arabic (53).

- Emotional regulation was assessed using the Difficulties in Emotion Regulation Scale-Short Form (DERS-SF), an 18-item scale measuring six domains of emotional regulation: strategies, non-acceptance, impulse, goals, awareness (reverse coded), and clarity (54). Items are measured using a 5-point scale spanning from 1 (almost never) to 5 (almost always) (55). Scoring is conducted using either the sum or the average of the items (54), with a total score ranging from 18 to 90. Higher scores indicate increased difficulty in emotion regulation (55, 56). The tool has been translated and validated in Arabic (55, 56).

- Communication skills were assessed using the Interpersonal Communication Competency Scale (ICCS), which evaluates ten dimensions of interpersonal communication competence, including self-disclosure, empathy, social relaxation, assertiveness, alter-centrism, interaction management, expressiveness, supportiveness, immediacy, and environmental control (57). Based on a study conducted in Brazil, 17 questions were selected from the scale (58). Notably, two items in the ICCS tool, namely "I have trouble defending myself" and "It's difficult to find the right words to express myself," are reverse-coded (58). Higher scores indicate a higher skill in interpersonal communication (58). The ICCS tool has been translated into Arabic by the research team following the WHO guidelines for translation and was then piloted to adapt it to the target population.

- Coping, problem management, and decision-making were assessed using the Revised Ways of Coping Checklist (RWoC), a multidimensional tool with satisfactory reliability and validity (59). The RWoC consists of items rated on a 4-point Likert scale ranging from 0 (not used) to 3 (used a great deal) (60), and captures a ranges of coping strategies. It also enables the research team to assess individual, interpersonal, and networked social supports (61). For this study, selected subscales were used to align with the research objectives. These subscales were confrontive coping, escape-avoidance, and planful problem-solving (59). The tool was originally developed in English and translated and validated in Arabic (62). The final score is not dichotomized but may be used for comparative purposes.

2.8 Statistical analysis

The Statistical Package for Social Science (SPSS) version 18 was used to conduct all analyses included in this study. Mediation analyses were conducted using the PROCESS macro plug in through parallel (model 4 option) and serial (model 6 option) mediation models. Parallel mediation was conducted for two outcomes (1) improvement in decision-making regarding family planning which is defined as consensus

or agreement between female participants and their male partners regarding family planning decision making, and (2) improvement in family planning use which is defined as movement from no use of family planning at baseline towards using family planning services between T0 and T2. In those two models, the same set of mediators were selected, and they are for tools measuring self-efficacy, wellbeing, coping skills, perceived social support, and communication skills measured at T1. An additional simple mediation model was conducted with wellbeing as an outcome and self-efficacy, social support, coping skills, and communication skills as mediators. The final model followed a serial mediation model with family planning decision making as the primary outcome, self-efficacy as mediator 1, and wellbeing as mediator 2. For all models, the same covariates were entered, which are: financial barriers to seeking healthcare, transportation barriers to seeking healthcare, and age. Similarly, for all models, the same independent variables were entered which are exposure group (control vs experimental). All mediation analyses involved examining unstandardized coefficients, standard errors, and lower and upper limits for confidence intervals. The PROCESS macro used bootstrap calculations for 95% confidence intervals for the indirect effects, based on 5,000 samples. Statistical significance was established when 95% confidence interval did not include zero. Because many of the outcomes used in this analysis were scored and yielded continuous scores, missing data on such surveys resulted in excluding participants from the analysis because of incomplete surveys and missing scores.

Although the study, based on its trial registration, primarily hypothesized that the intervention would yield improvements in use of FP services, this study focused on family planning-related decision making. This is because no significant improvements in FP use were reported in a previous outcome evaluation produced under this trial. As a result, we only examined the outcome of decision-making regarding FP as post-hoc analyses, to better understand the impact of the intervention on FP related matters proxy indicators beyond use of services.

2.9 Ethical considerations

Ethical approval was sought and obtained from the Institutional Review Board (IRB) of the American University of Beirut (AUB) and the Ethics Research Committee (ERC) at the World Health Organization (WHO). All participants signed an informed consent after they received detailed information about the study's objectives, participant's rights, and their ability to withdraw from the study at any time without consequences for their access to PHC services or other entitled benefits. To maintain ethical standards, all procedures were supervised by trained field coordinators who ensured adherence to the study protocol and safeguarded participants' safety. A psychologist was present on-site to handle any distress arising during sessions, and participants with potential mental health concerns were offered NGO referrals. To promote accessibility and comfort, all the intervention material was adapted to Arabic, and only female data collectors were recruited. All assigned staff received comprehensive training in ethical data collection, confidentiality, and risk detection. To protect participants' anonymity, all personal identifiers were replaced with unique codes throughout the data collection and analysis process.

3. Results

The sample included a total of 267 refugee women and girls, n=144 allocated to waitlisted control group, and n=123 to the experimental group, however for the final analysis the number of participants was reduced for the control group (n=108) and for the experimental group (n=109) due to missing data and loss to follow-up resulting from the war. Across both groups, most participants had achieved a maximum of primary school education, were not currently working, were married only once, were pregnant at least

once, and were not using FP methods. A detailed description of study group can be found in the supplementary materials annex 1.

Parallel Mediation Models:

Two parallel mediation models (i.e model 4 on PROCESS) were conducted. In the first, improvements in self-efficacy, wellbeing, coping, social support, and communication skills at T1 were entered as mediators, and improvements in FP-related decision-making at T2 as outcome. Results did not show significant indirect effects of the total model (indirect effect=0.251; CI=-0.011;0.578), whereby only wellbeing showed positive and significant indirect effects suggesting that it may mediate the relationship between exposure to intervention and improvements in FP-related decision-making (indirect effect=0.215; CI=0.029;0.501) when compared to other examined psychosocial factors. As for the second model, self-efficacy, coping, social support, and communication skills were entered as mediators, and wellbeing was entered as an outcome. Positive and statistically significant direct (indirect effect=4.224; CI=2.222;6.224) and indirect (indirect effect=2.903; CI=0.992;4.813) effects were found in relation to exposure to intervention and improvements in wellbeing at T1. Specifically, positive and significant indirect effects were found only on self-efficacy (indirect effect=0.963; CI=0.298;1.864), suggesting that it may mediate the relationship between exposure to the intervention and improvements in wellbeing when compared to other examined psychosocial factors (see supplementary material for relevant tables).

Serial Mediation Model:

A final serial mediation model (i.e model 6 on PROCESS, see table 2) was tested to examine whether the effect of group assignment on improvement in FP-related decision-making at T2 operated through improvements in self-efficacy at T1 and wellbeing at T1, controlling for financial barriers to healthcare, distance barriers to healthcare, and age. Results showed statistically significant negative direct effects of exposure to intervention and improvements in FP-decision making at T2 suggesting that mere exposure to the intervention decreases FP-related decision-making when controlling for mediators of self-efficacy and wellbeing (direct effect=-0.671; $p<0.05$). However, after including self-efficacy and wellbeing as mediators, the total indirect effect was significant (indirect effect=0.284; CI=0.099;0.566), indicating that the intervention influenced improvements through the combined mediation of self-efficacy and wellbeing. Results of specific indirect effects showed that the pathway operating through wellbeing alone was significant (indirect effect=0.149; CI=0.012-0.382), and the sequential pathway operating through self-efficacy following by wellbeing was also significant (indirect effect=0.054; CI=0.005-0.137). Indirect effect through self-efficacy alone however was not significant (indirect effect=0.081; CI=-0.056;0.283). These findings indicate that the intervention increased the likelihood of improvements primarily through its influence on wellbeing, and through sequential improvements in self-efficacy that subsequently enhanced wellbeing, however without those mediating variables, the effect is negative (see figure 2).

[Insert table 2]

[Insert figure 2]

Table 2. Serial Mediation Model – Indirect Effects

	Indirect Effect	CI (LLCI;ULCI)
Total Indirect Effects	0.284	0.099;0.5667*

Indirect Path 1 Exposure->Self-Efficacy->Decision-making	0.081	-0.056;0.283
Indirect Path 2 Exposure->Wellbeing->Decision-making	0.148	0.012;0.382*
Indirect Path 3 Exposure->self-efficacy->wellbeing->Decision-making	0.054	0.004;0.1371*

Discussion

The SEEK intervention package was designed on the premise that improving psychosocial functioning and particularly self-efficacy would improve wellbeing and in turn, improve FP related outcomes among AGYW in humanitarian settings. This premise is well-supported by previous theories positing that self-efficacy is a fundamental determinant of human motivation, plays a pivotal role in fostering well-being and personal accomplishment, and mediates therapeutic and behavioral change (63-65). Also, evidence from prior interventions supports this, such as the Respecting the Circle of Life (RCL) intervention, a skills-based sexual reproductive health program, which identified condom-use self-efficacy as the principal mechanism through which the intervention improved condom-use intentions (66). Similarly, a psychosocial program integrating cognitive-behavioral strategies and medical education, found that improvements in coping and self-efficacy partially mediated the intervention's effects on quality of life, depression, and anxiety among caregivers (67). As such, SEEK focuses not only on SRH and FP-related education, but integrates within these modules, education on emotional regulation, problem solving, and communication skills among others that are assumed to improve self-efficacy. SEEK assumes that by targeting such essential factors in an integrated manner, these would eventually lead to improvements on its main outcomes of interest, namely uptake of FP services. However, evidence to support these assumptions for the SEEK package was missing and needed.

The present study is among the first to empirically test these mechanisms of change within an integrated PSS–SRH intervention delivered during active conflict, using a randomized controlled trial and mediation-based analytic approach. The findings offer important insights into how and under what conditions such interventions influence FP-related decision-making. This is also the first study to examine this relationship as part of the SEEK trial in Lebanon.

Although the primary outcome of interest was to improve uptake of FP services 3 months after the intervention, no significant changes were observed when comparing exposure group to the waitlisted control at endline or at 3-months post intervention, potentially due to active conflict, bombardment and displacement and cultural challenges (68). For this reason, this study instead examined effectiveness of the integrated intervention on another proxy FP outcome related to decision-making agreement between participating females and their male partners. Evidence from behavioral theory highlights that decision-making is a critical step in the process of behavioral change (69), representing the stage where intentions begin to translate into action (70). Advancement through the stages of behavioral change is heavily influenced by the effectiveness of an individual's decision-making process (71). Consistent with this, prior research indicates that couples' agreement on women's participation in household and reproductive

decisions has been linked to greater healthcare and contraceptive use, whereas spousal disagreement or limited communication serves as a barrier that blocks method uptake, often due to women fearing conflict or incorrectly assuming male disapproval (72-74).

That said, this study examined whether improvements in key psychosocial variables of wellbeing, self-efficacy, coping strategies, communication skills, and perceived social support at endline acted as potential mediators between the relationship of exposure to the intervention and improvement in FP decision making 3 months post intervention. In previous outcome evaluations, significant improvements were found in SRH-related attitudes and knowledge, but not in behaviors at endline and 3-months post intervention (68). Significant improvements were also found on key psychosocial measures at endline and 3-months post intervention including wellbeing, coping, and perceived social support, only at endline including self-efficacy, and only 3 months post intervention including communication skills (75).

Results for this present study suggested that from the aforementioned psychosocial variables, only improvements in wellbeing at T1 mediated this relationship. Ad-hoc analyses examining improvements in wellbeing as an outcome, and improvements in the remaining psychosocial variables as mediators at T1, indicated that only self-efficacy mediated the relationship between exposure to the intervention and improved wellbeing at endline. This finding aligns with extensive evidence showing that higher self-efficacy is closely linked to enhanced psychological wellbeing (76). Prior literature has similarly underscored the mediating role of self-efficacy in linking intervention to improved wellbeing outcomes (77, 78). In parallel, previous research among caregivers demonstrated that self-efficacy and wellbeing can operate sequentially, mediating the association between caregiver burden and sleep quality. For example, it was suggested that improvement in self-efficacy may foster better emotional wellbeing, which may contribute to improvement in sleep quality, although causal inference was limited by the cross-sectional design (79).

Building on this foundation, the current study advances prior research by explaining the mechanistic pathway through which SEEK achieves its effect on FP-related decision-making. Specifically, the final serial mediation analysis confirmed a sequential pathway whereby exposure to the intervention led to improvements in self-efficacy, which in turn led to improvement in wellbeing, and subsequently improvements in FP-related decision-making 3 months post intervention. These findings also reinforce the SEEK conceptual framework, which posits that enhanced self-efficacy and wellbeing are indispensable mechanisms to improvements in SRH and FP-related outcomes.

A key finding in this study is the presence of a negative direct effect of the intervention on FP-related decision-making when psychosocial mediators are not considered. This suggests that introducing sensitive FP and SRH topics—particularly in contexts marked by constrained gender norms and war-related stress—may initially create tension, discomfort, or conflict for participants. This finding is consistent with literature documenting 'gender backlash' in decision-making and resistance to change, in settings where power dynamics are challenged (80). This challenge can trigger resistance in male partners who may fear losing their traditional authority or 'face' in the community by approving of their wives' contraceptive use (81, 82). However, when psychosocial improvements especially in self-efficacy and wellbeing were included in the model, the total effect of the intervention became positive. This suggests that an inconsistent mediation with suppression effects is evident in the statistical analysis, which ultimately reinforces the underlying core assumption that psychosocial functioning, specifically self-efficacy and

wellbeing, are not merely beneficial but are critical and essential for mitigating early tensions and enabling constructive FP decision-making.

Although improvements in uptake of FP services were not established, this may not be unexpected. Behavioural change/adoption requires an interplay of structural, social, relational and health system enabling conditions, many of which may have been severely compromised during the war on Lebanon. Evidence from conflict-affected settings shows that SRH is often deprioritized within health service provision, as families tend to focus on immediate survival needs, such as food, shelter, and security, rather than healthcare (83, 84). Moreover, conflict-related loss of income and livelihoods introduces additional economic barriers, making it increasingly difficult for families to seek or sustain FP and maternal health care (85, 86). Moreover, male partner engagement, an important determinant of FP use, was not directly addressed by the intervention. The current findings therefore suggest that psychosocial improvements may represent a necessary but insufficient step toward behavioral change, requiring complementary system-level and relational supports including male partners in FP-related education and behavioral recommendations.

Despite the contextual challenges of implementation highlighted above, the study demonstrates the feasibility and value of conducting mechanism-focused evaluations in humanitarian settings. It provides important empirical evidence on how integrated PSS–SRH interventions exert their effects and highlights the central role of psychosocial functioning in enabling SRH-related decision-making among refugee populations.

5. Limitations

Findings reported in this study should be interpreted in light of several limitations. Most importantly, because no significant changes were found on the main outcome of interest, namely use of family planning services, we could not examine statistically this outcome in our mediation models. We had to instead rely on a proxy indicator of decision-making regarding family planning, which limited our ability to examine any behavioral changes associated with the intervention. Nevertheless, it is important to note that many contextual limitations prohibited our capacity to fully implement the study as originally planned. This includes the impact of war, displacement, and other instabilities that were prevalent during the time when this intervention was being implemented in Lebanon. Also, we only collected data from participating women who answered based on their perceptions of decision-making processes of their male partners. This may distort results as they may differ if data was collected directly from male partners.

6. Conclusion

This study provides important mechanistic evidence that self-efficacy and wellbeing are primary pathways through which SEEK interventions improved FP-related decision-making. These findings underscore the importance of strengthening the psychosocial components of integrated SRH interventions, and to accompany them with structural and relational interventions that may enable translation into changes in FP behaviour - including uptake of services. The findings have significant relevance for SRH programming in humanitarian contexts, where psychosocial vulnerability in combination with restricted agency, and instability intersect to shape and adversely impact SRH decision-making and health outcomes.

References

1. Okeke SR, Okeke-Obayemi DO, Njoroge MR, Yaya S. Collateral damage: the overlooked reproductive health crisis in conflict zones. Reprod Health. 2024;21(1):198.
2. Starrs AM, Ezeh AC, Barker G, Basu A, Bertrand JT, Blum R, et al. Accelerate progress—sexual and reproductive health and rights for all: report of the Guttmacher–Lancet Commission. The lancet. 2018;391(10140):2642-92.
3. WHO. Investing in sexual and reproductive health and rights: essential elements of universal health coverage 2023 [Available from: https://www.who.int/publications/m/item/investing-in-sexual-and-reproductive-health-and-rights-essential-elements-of-universal-health-coverage.
4. UNFPA. ADOLESCENT SEXUAL AND REPRODUCTIVE HEALTH AND Rights. 2022.
5. Desrosiers A, Betancourt T, Kergoat Y, Servilli C, Say L, Kobeissi L. A systematic review of sexual and reproductive health interventions for young people in humanitarian and lower-and-middle-income country settings. BMC Public Health. 2020;20(1):666.
6. Soeiro RE, de Siqueira Guida JP, da-Costa-Santos J, Costa ML. Sexual and reproductive health (SRH) needs for forcibly displaced adolescent girls and young women (10–24 years old) in humanitarian settings: a mixed-methods systematic review. Reproductive Health. 2023;20(1):174.
7. Honein- AbouHaidar G, Naal H, Dakdouki AE, Chamseddine Z, Sarieddine D, Tamim H, et al. Demographic and clinical associations with miscarriage and unsuccessful conception attempts among female Syrian refugees in Lebanon. BMC Pregnancy and Childbirth. 2025;25(1):837.
8. Singh NS, Aryasinghe S, Smith J, Khosla R, Say L, Blanchet K. A long way to go: a systematic review to assess the utilisation of sexual and reproductive health services during humanitarian crises. BMJ global health. 2018;3(2):e000682.
9. DeJong J, Ghattas H, Bashour H, Mourtada R, Akik C, Reese-Masterson A. Reproductive, maternal, neonatal and child health in conflict: a case study on Syria using Countdown indicators. BMJ global health. 2017;2(3):e000302.
10. Stover J, Ross J. How Increased Contraceptive Use has Reduced Maternal Mortality. Maternal and Child Health Journal. 2010;14(5):687-95.
11. WHO. Contraception 2024 [Available from: https://www.who.int/health-topics/contraception#tab=tab_1.
12. USAID. Healthy Timing and Spacing of Pregnancies: A Family Planning Investment Strategy for Accelerating the Pace of Improvements in Child Survival 2012.
13. Benage M, Greenough PG, Vinck P, Omeira N, Pham P. An assessment of antenatal care among Syrian refugees in Lebanon. Conflict and health. 2015;9(1):1-11.
14. Cherri Z, Gil Cuesta J, Rodriguez-Llanes JM, Guha-Sapir D. Early marriage and barriers to contraception among Syrian refugee women in Lebanon: a qualitative study. International journal of environmental research and public health. 2017;14(8):836.
15. Inter_Agency_Working_Group. A Statement on Family Planning for Women and Girls as a Life-saving Intervention in Humanitarian Settings. 2010.
16. Singh S, Darroch JE, Ashford LS. Adding it up: the costs and benefits of investing in sexual and reproductive health 2014. 2014.
17. Ho LS, Wheeler E. Using program data to improve access to family planning and enhance the method mix in conflict-affected areas of the Democratic Republic of the Congo. Global Health: Science and Practice. 2018;6(1):161-77.
18. BARUT S, GÜNEY E, UÇAR T. The Effects of Family Planning Methods Used Among Women in Turkey on Depression, Anxiety and Stress Levels. Firat Universitesi Sağlik Bilimleri Tip Dergisi. 2022;36(3).

19. WHO. Family planning/contraception methods. 2025.
20. Boamah-Kaali EA, Ruiter RAC, Owusu-Agyei S, Asante KP, Mevissen FEF. Social-psychological determinants of hormonal contraceptive use intentions among adolescent girls in the Bono East Region of Ghana. Frontiers in Public Health. 2023;Volume 11 - 2023.
21. UNHCR. Lebanon-Needs at A Glance-2024. 2024.
22. Usta J, Taleb R, El Harakeh S, El Kheir R, Jbahi M, Dassouki S, et al. Predictors of Contraception Use Among Syrian Refugees in Lebanon: Results from a Cross-Sectional Study. Maternal and Child Health Journal. 2021;25(4):684-93.
23. Chahine A, Al-Masri M, Samra S, Abla Z. Situation analysis of youth in Lebanon affected by the Syrian crisis. Lebanon: United Nations. 2014.
24. Kabakian-Khasholian T, Mourtada R, Bashour H, Kak FE, Zurayk H. Perspectives of displaced Syrian women and service providers on fertility behaviour and available services in West Bekaa, Lebanon. Reproductive health matters. 2017;25(sup1):75-86.
25. Nabulsi D, Abou Saad M, Ismail H, Doumit MAA, El-Jamil F, Kobeissi L, et al. Minimum initial service package (MISP) for sexual and reproductive health for women in a displacement setting: a narrative review on the Syrian refugee crisis in Lebanon. Reprod Health. 2021;18(1):58.
26. Talhouk R, Mesmar S, Thieme A, Balaam M, Olivier P, Akik C, et al., editors. Syrian refugees and digital health in Lebanon: Opportunities for improving antenatal health. Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems; 2016.
27. Naal H, Nabulsi D, El Arnaout N, Abdouni L, Dimassi H, Harb R, et al. Prevalence of depression symptoms and associated sociodemographic and clinical correlates among Syrian refugees in Lebanon. BMC Public Health. 2021;21(1):217.
28. Kazour F, Zahreddine NR, Maragel MG, Almustafa MA, Soufia M, Haddad R, et al. Post-traumatic stress disorder in a sample of Syrian refugees in Lebanon. Compr Psychiatry. 2017;72:41-7.
29. Korri R, Hess S, Froeschl G, Ivanova O. Sexual and reproductive health of Syrian refugee adolescent girls: a qualitative study using focus group discussions in an urban setting in Lebanon. Reproductive Health. 2021;18(1):130.
30. Garbers S, Correa N, Tobier N, Blust S, Chiasson MA. Association between symptoms of depression and contraceptive method choices among low-income women at urban reproductive health centers. Maternal and child health journal. 2010;14:102-9.
31. Hall KS, Moreau C, Trussell J, Barber J. Young women's consistency of contraceptive use—does depression or stress matter? Contraception. 2013;88(5):641-9.
32. Hall KS, Moreau C, Trussell J, Barber J. Role of young women's depression and stress symptoms in their weekly use and nonuse of contraceptive methods. Journal of Adolescent Health. 2013;53(2):241-8.
33. Thomas K, Nilsson E, Festin K, Henriksson P, Lowén M, Löf M, et al. Associations of Psychosocial Factors with Multiple Health Behaviors: A Population-Based Study of Middle-Aged Men and Women. Int J Environ Res Public Health. 2020;17(4).
34. Murray J, Fenton G, Honey S, Bara AC, Hill KM, House A. A qualitative synthesis of factors influencing maintenance of lifestyle behaviour change in individuals with high cardiovascular risk. BMC cardiovascular disorders. 2013;13(1):48.
35. Thomas K, Bendtsen P, Krevers B. Implementation of healthy lifestyle promotion in primary care: patients as coproducers. Patient education and counseling. 2014;97(2):283-90.
36. Owoeye OBA, McKay CD, RÄisÄnen AM, Hubkarao T, Palacios-Derflingher L, Emery CA. Psychosocial Factors and the Effects of a Structured Injury Prevention Workshop on Coaches' Self-Efficacy to Implement the 11+ Exercise Program. Int J Exerc Sci. 2020;13(5):1459-75.

37. Akonor PY, Ayanore MA, Anaman-Torgbor JA, Tarkang EE. Psychosocial factors influencing contraceptive use among adolescent mothers in the Volta Region of Ghana: application of the Health Belief Model. Afr Health Sci. 2021;21(4):1849-59.
38. Harper M, Kobeissi L, Servili C, Say L. Conceptualizing a low resource-low intensity psychosocial-SRH integrated intervention to improve sexual and reproductive health care seeking among young women in humanitarian settings. Available at SSRN 3551316. 2020.
39. UNHCR. Operational Data Portal. 2023.
40. UNHCR. DATA AND STATISTICS Global Trends. 2023.
41. Saleh S, Naal H, Dakdouki A, Chamseddine Z, Govender V, Sarieddine D, et al. Process Evaluation of an Integrated Community-Based Trial to Improve Family Planning, Sexual Reproductive Health, and Wellbeing among Syrian Refugee Women and Girls in Lebanon During Active Conflict2025.
42. Kobeissi L, El Kak FH, Khawaja M, Khoshnood K. HIV/AIDS-related knowledge and its association with socioeconomic status among women: results of Lebanese Survey for Family Health (PAPFAM) 2004. Asia Pac J Public Health. 2015;27(2):Np734-45.
43. UNICEF. Yemen Multiple Indicator Cluster Survey 2006. 2006.
44. Lakkis NA, Osman MH, Aoude LC, Maalouf CJ, Issa HG, Issa GM. A Pilot Intervention to Promote Positive Parenting in Refugees from Syria in Lebanon and Jordan. Front Psychiatry. 2020;11:257.
45. Crandall A, Abdul-Rahim H, Yount K. Validation of the General Self-Efficacy Scale among Qatari young women. Eastern Mediterranean health journal = La revue de santé de la Méditerranée orientale = al-Majallah al-ṣiḥḥīyah li-sharq al-mutawassiṭ. 2016;21:891-6.
46. Chesney MA, Neilands TB, Chambers DB, Taylor JM, Folkman S. A validity and reliability study of the coping self-efficacy scale. Br J Health Psychol. 2006;11(Pt 3):421-37.
47. Scholz U, Doña BG, Sud S, Schwarzer R. Is general self-efficacy a universal construct? Psychometric findings from 25 countries. European journal of psychological assessment. 2002;18(3):242.
48. Vindbjerg E, Mortensen EL, Makransky G, Nielsen T, Carlsson J. A rasch-based validity study of the HSCL-25. Journal of Affective Disorders Reports. 2021;4:100096.
49. Fares S, Dirani J, Darwish H. Arabic validation of the hopkins symptom checklist-25 (HSCL) in a Lebanese sample of adults and older adults. Current Psychology. 2021;40:1-8.
50. Winokur A, Winokur DF, Rickels K, Cox DS. Symptoms of emotional distress in a family planning service: stability over a four-week period. Br J Psychiatry. 1984;144:395-9.
51. Fares S, Dirani J, Darwish H. Arabic validation of the hopkins symptom checklist-25 (HSCL) in a Lebanese sample of adults and older adults. Current Psychology. 2021;40(6):2980-7.
52. Aroian K, Templin TN, Ramaswamy V. Adaptation and psychometric evaluation of the Multidimensional Scale of Perceived Social Support for Arab immigrant women. Health care for women international. 2010;31(2):153-69.
53. Fekih-Romdhane F, Fawaz M, Hallit R, Sawma T, Obeid S, Hallit S. Psychometric properties of an Arabic translation of the multidimensional social support scale (MSPSS) in a community sample of adults. BMC psychiatry. 2023;23(1):432.
54. Kaufman E, Xia M, Fosco G, Yaptangco M, Skidmore C, Crowell S. DERS-SF scoring and measure. 2015.
55. Brown FL, Bosqui T, Elias J, Farah S, Mayya A, Abo Nakkoul D, et al. Family systemic psychosocial support for at-risk adolescents in Lebanon: study protocol for a multi-site randomised controlled trial. Trials. 2022;23(1):327.
56. Bjureberg J, Ljótsson B, Tull MT, Hedman E, Sahlin H, Lundh L-G, et al. Development and validation of a brief version of the difficulties in emotion regulation scale: the DERS-16. Journal of psychopathology and behavioral assessment. 2016;38:284-96.
57. Rubin R, Martin M. Development of a measure of interpersonal competence. Communication Research Reports. 1994;11:33-44.

58. Puggina AC, Silva MJPd. Interpersonal Communication Competence Scale: Brazilian translation, validation and cultural adaptation. Acta Paulista de Enfermagem. 2014;27(2):108-14.
59. Vitaliano PP, Russo J, Carr JE, Maiuro RD, Becker J. The Ways of Coping Checklist: Revision and Psychometric Properties. Multivariate Behavioral Research. 1985;20(1):3-26.
60. Folkman S, Lazarus RS. If it changes it must be a process: study of emotion and coping during three stages of a college examination. Journal of personality and social psychology. 1985;48(1):150.
61. Vitaliano PP, Joan R, E. CJ, D. MR, and Becker J. The Ways of Coping Checklist: Revision and Psychometric Properties. Multivariate Behavioral Research. 1985;20(1):3-26.
62. Beainy S, El-Hasan K. Coping strategies and personal growth: The case of Palestinian refugees in Shatila camp, Lebanon. Frontiers in Psychology. 2023;14.
63. Locke EA. Self-efficacy: The exercise of control. Personnel psychology. 1997;50(3):801.
64. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychological review. 1977;84(2):191.
65. Lopez-Garrido G. Bandura's self-efficacy theory of motivation in psychology. Simply Psychology. 2023;10(1).
66. Rosenstock S, Chambers R, Lee A, Goklish N, Larzelere F, Tingey L. Self-efficacy and response-efficacy: critical components of sexual and reproductive health interventions targeting condom use intention among American Indian adolescents. AIDS Care. 2020;32(3):379-85.
67. Jacobs JM, Nelson AM, Traeger L, Waldman L, Nicholson S, Jagielo AD, et al. Enhanced coping and self-efficacy in caregivers of stem cell transplant recipients: Identifying mechanisms of a multimodal psychosocial intervention. Cancer. 2020;126(24):5337-46.
68. Saleh et al. Evaluation of the Self-Efficacy and Knowledge (SEEK) Randomized Community-Based Trial for Syrian Refugee Adolescent Girls and Young Women: Family Planning and Sexual Reproductive Health Outcomes under_review.
69. Prochaska J. Decision Making in the Transtheoretical Model of Behavior Change. Medical decision making : an international journal of the Society for Medical Decision Making. 2008;28:845-9.
70. Spreer P. Behavior Patterns for the Decision-Making Phase. In: Spreer P, editor. PsyConversion®: 117 Behavior Patterns for an improved User Experience and higher Conversion Rates in E-Commerce. Wiesbaden: Springer Fachmedien Wiesbaden; 2024. p. 85-259.
71. Prochaska JO. Decision making in the transtheoretical model of behavior change. Med Decis Making. 2008;28(6):845-9.
72. Dixit A, Johns NE, Ghule M, Battala M, Begum S, Yore J, et al. Male–female concordance in reported involvement of women in contraceptive decision-making and its association with modern contraceptive use among couples in rural Maharashtra, India. Reproductive Health. 2021;18(1):139.
73. Biddlecom AE, Fapohunda BM. Covert contraceptive use: prevalence, motivations, and consequences. Stud Fam Plann. 1998;29(4):360-72.
74. Mtae H. Decision-Making Power and Family Planning Use: A Case of Married Women in Kishapu District, Tanzania. EAST AFRICAN JOURNAL OF EDUCATION AND SOCIAL SCIENCES. 2022;2:136-45.
75. Naal H, Dakdouki A, Chamseddine Z, Govender V, Bosqui T, AbouHaidar G, et al. Evaluating Mental Health and Psychosocial Support Outcomes of the Self-Efficacy and Knowledge (SEEK) Community-Based Randomized Controlled Trial in Lebanon During Active Conflict2025.
76. Siddiqui S. Impact of self-efficacy on psychological well-being among undergraduate students. The International Journal of Indian Psychology. 2015;2(3):5-16.
77. Otto R, Jürgensen IN, Nienhaus A, Koch P. The mediating role of self-efficacy in the relationship between health literacy, health status and psychological well-being among German trainees and students in nursing. Front Public Health. 2024;12:1436665.
78. Wu M, Wang W, He H, Bao L, Lv P. Mediating Effects of Health Literacy, Self-Efficacy, and Social Support on the Relationship Between Disease Knowledge and Patient Participation Behavior Among

Chronic Ill Patients: A Cross-Sectional Study Based on the Capability-Opportunity-Motivation and Behavior (COM-B) Model. Patient Prefer Adherence. 2025;19:1337-50.
79. Yang Z, Sun F, Zhao L, Hu T, Lin X, Guo Y. Self-efficacy and well-being in the association between caregiver burden and sleep quality among caregivers of elderly patients having multiple chronic conditions in rural China: a serial multiple mediation analysis. BMC Nursing. 2023;22(1):424.
80. Vara-Horna AA, Rodríguez-Espartal N. The Aggressive Gender Backlash in Intimate Partner Relationships: A Theoretical Framework and Initial Measurement. Behav Sci (Basel). 2025;15(7).
81. Rutenberg N, Watkins SC. The buzz outside the clinics: conversations and contraception in Nyanza Province, Kenya. Stud Fam Plann. 1997;28(4):290-307.
82. Mosha I, Ruben R, Kakoko D. Family planning decisions, perceptions and gender dynamics among couples in Mwanza, Tanzania: a qualitative study. BMC Public Health. 2013;13:523.
83. Abubakar I, Aldridge RW, Devakumar D, Orcutt M, Burns R, Barreto ML, et al. The UCL–Lancet Commission on Migration and Health: the health of a world on the move. The Lancet. 2018;392(10164):2606-54.
84. Singh NS, Aryasinghe S, Smith J, Khosla R, Say L, Blanchet K. A long way to go: a systematic review to assess the utilisation of sexual and reproductive health services during humanitarian crises. BMJ Glob Health. 2018;3(2):e000682.
85. Purdin S, Khan T, Saucier R. Reducing maternal mortality among Afghan refugees in Pakistan. Int J Gynaecol Obstet. 2009;105(1):82-5.
86. Singh NS, Smith J, Aryasinghe S, Khosla R, Say L, Blanchet K. Evaluating the effectiveness of sexual and reproductive health services during humanitarian crises: A systematic review. PLoS One. 2018;13(7):e0199300.

Figure 1: CONSORT 2025 Flow Diagram

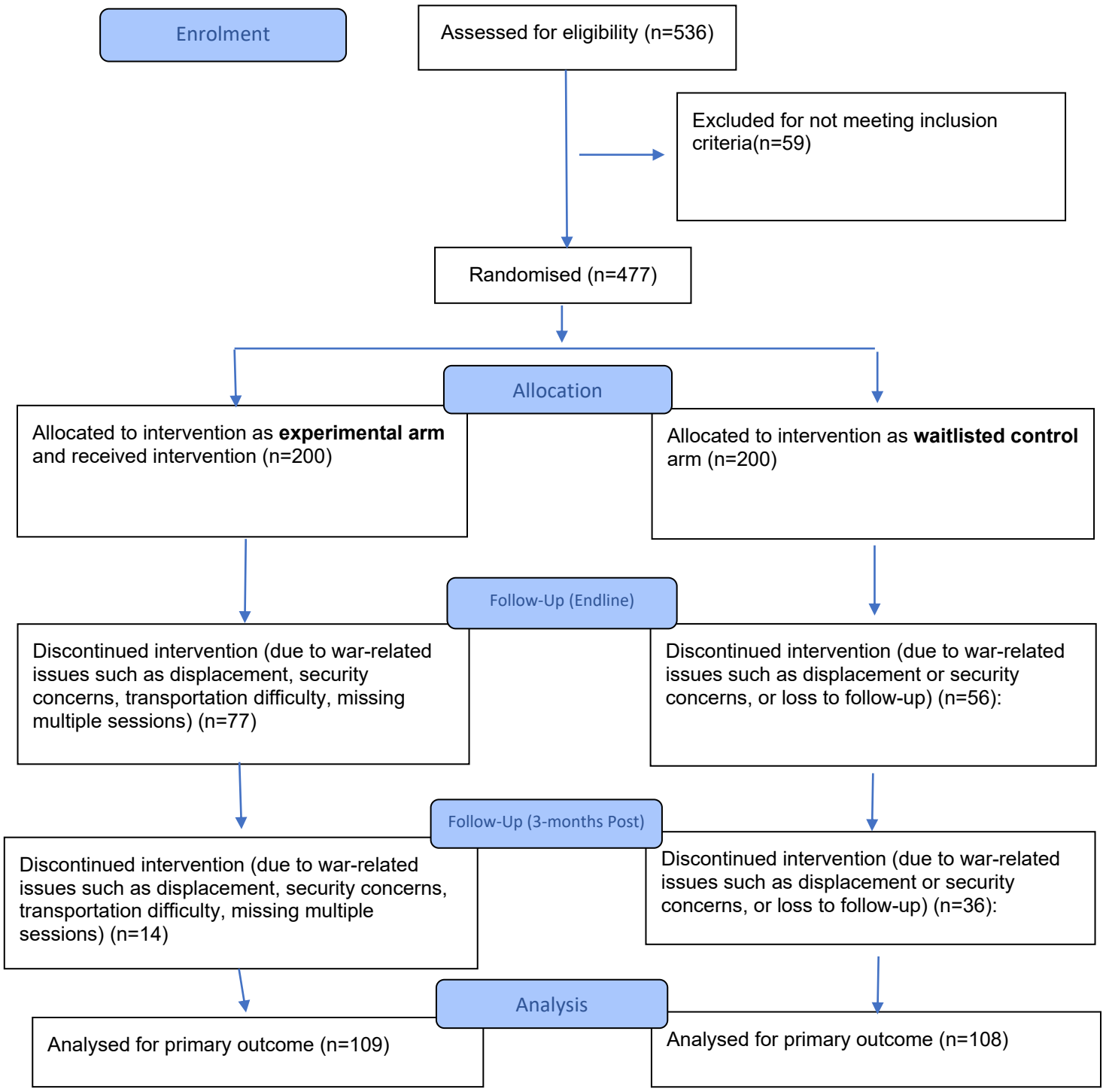
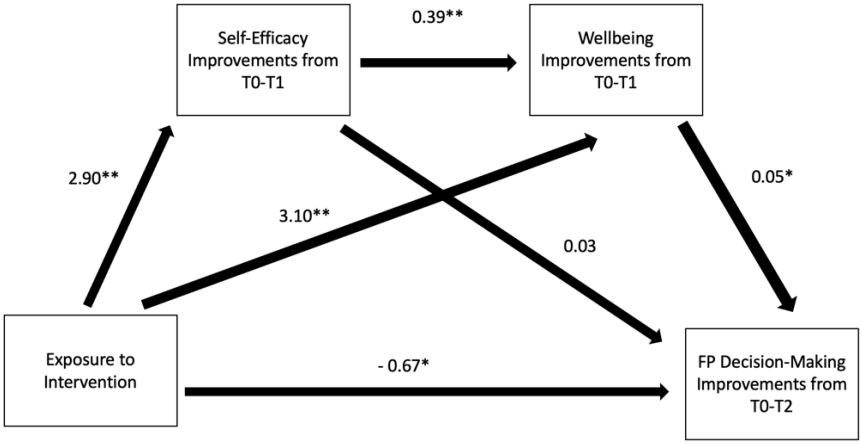


Figure 2. Chain-Mediated Effects Model of Self-Efficacy and Wellbeing



Annex 1 –

Table 1. Baseline Demographic Differences across the Control and Experimental (n=267) (taken from Saleh et al (41)

	Baseline		
Variables	**Control**	**Experimental**	
	N (%)	**N (%)**	
	n=144	**n=123**	***P* value**
Education			0.161
Illiterate	14 (9.7 %)	22 (17.9 %)	
Primary	74 (51.4 %)	58 (47.2 %)	
Intermediate	48 (33.3 %)	34 (27.6 %)	
Secondary and higher	8 (5.6 %)	9 (7.3 %)	
Work Currently			
Yes	14 (9.7 %)	25 (20.3%)	0.393
Marriage Times			
One time	138 (95.8 %)	115 (93.5 %)	0.391
Barriers to Healthcare			
Permission to go to PHC	61 (42.4 %)	55 (44.7 %)	0.699
Financial Barrier	96 (67.1 %)	76 (61.8 %)	0.363
Distance for HC Facility	89 (61.8 %)	73 (59.4 %)	0.682
Didn't find Place to go	93 (64.6 %)	89 (72.4 %)	0.174
Don't want to go alone	91 (63.2 %)	81 (65.9 %)	0.651
There is no female doctor	62(43.1%)	55(44.7%)	0.785
Ever Pregnant			
Yes	110 (76.4 %)	107 (86.9 %)	0.027*
Abortion or Miscarriage	55 (38.2 %)	53 (43.1 %)	0.172
Current Use of Family Planning	55 (38.2 %)	51 (41.5 %)	0.586
Past Use of Family Planning,	40 (27.8 %)	37 (30.1 %)	0.679
Problems with Family Planning	18 (45 %)	21 (56.7 %)	0.303

Pain Urinating	92 (63.9 %)	66 (53.7 %)	0.090
Vaginal Discharge	95 (65.9 %)	80 (65.0 %)	0.873
Itching	72 (50.0 %)	62 (50.41 %)	0.947
Foul Smelling Discharge	81 (56.3 %)	60 (48.8 %)	0.223
Abdominal Pain	84 (58.3 %)	72 (58.5 %)	0.973
Consult for Treatment	75 (52.1 %)	55 (44.7 %)	0.230
Heard of STI Disease	76 (52.8 %)	73 (59.4 %)	0.281