

Date 3/10/2026

Effectiveness of a Novel Web Application Health Education Intervention in Enhancing Knowledge, Attitudes, and Practices to Promote Prostate Cancer Prevention Behaviors Among Male University Staff in Iraq

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Research Questions

Is the use of the Web-application an effective approach for delivering health education modules to Iraqi male university staff towards promoting prostate cancer prevention behaviors?

Research Objectives

To compare the effectiveness of the education modules on the knowledge, attitude, and practice of male university staffs towards prostate cancer prevention behaviors by comparing the pre- and post-test of Iraqi male university staffs' knowledge, attitude, and practice.

Study population

The research will proceed to be performed in the country of Iraq. Participants in the research will be male university staff members who are employed at Middle Technical University (MTU). This university contains 17 colleges and institutes, divided into five colleges and twelve institutes that are spread across four cities in Iraq.

Inclusion criteria

- 1- Males at risk are 40 years of age and over.
- 2- The male who educational level primary school and above.
- 3- The male who gives informed consent and is willing to participate in the study.
- 4- Men who did not receive any health education program about prostate cancer.

Exclusion criteria

- 1- The male staff outside middle technical university.
- 2- The male who has prostate cancer.
- 3- The male who is critically illness.
- 4- Withdrawal criteria include males who are unable or unwilling to comply with the study requirements, failure to attend the meeting schedules, and have substantial changes in health conditions, such as developing new medical conditions, having serious adverse events, or any other conditions that could impact the study results.

Study Design

The study will be a Cluster Randomized Controlled Trial (Cluster RCT) study design among male university staff with a pre-test and post-test to evaluate the effectiveness of the intervention modules that will be used for the study in this phase. A control group will be chosen that has similar characteristics and functioning as the intervention group.

Sampling method

The study will consist of selecting one college or institute out of 8 using a simple random sampling method, which will involve the classification of one college or institute for the intervention group and one for the control group. This will be done by utilizing a randomization process. The

participants will be volunteers to participate in the study, and then the final selection of study participants will be determined by the specific inclusion criteria established for each group. The selection of participants will be contingent upon adherence to the predetermined sample size.

Sample size determination

The determination of the minimum sample size required to test the study hypotheses for the specific objective will be accomplished using the G*Power 3.1.9.4 software's sample size calculator. The choice of the effect size will be based on (Cohen,1988) recommendation to adopt a medium effect size of 0.25. The selected (α error probability) is 0.05, while the power ($1 - \beta$ error probability) is established at 0.80. test family is F-tests. Apply statistical test ANOVA: repeated measures, between factors, within factors, and within-between interaction, and then take the biggest sample size, as shown in **Figures 1, 2, and 3**. According to the calculation software, the minimum sample size required for this study is 128 participants; an additional 20.0% will be added after considering drop-out from the study, which resulted in $128 / (1-0.20) = 160$. Divided into two groups: the intervention group and the control group. Therefore, the required sample size for each group in this study will be determined by dividing 160 by 2, resulting in 80. Ultimately, the intervention group will consist of 80 participants, whereas the control group will also consist of 80 participants.

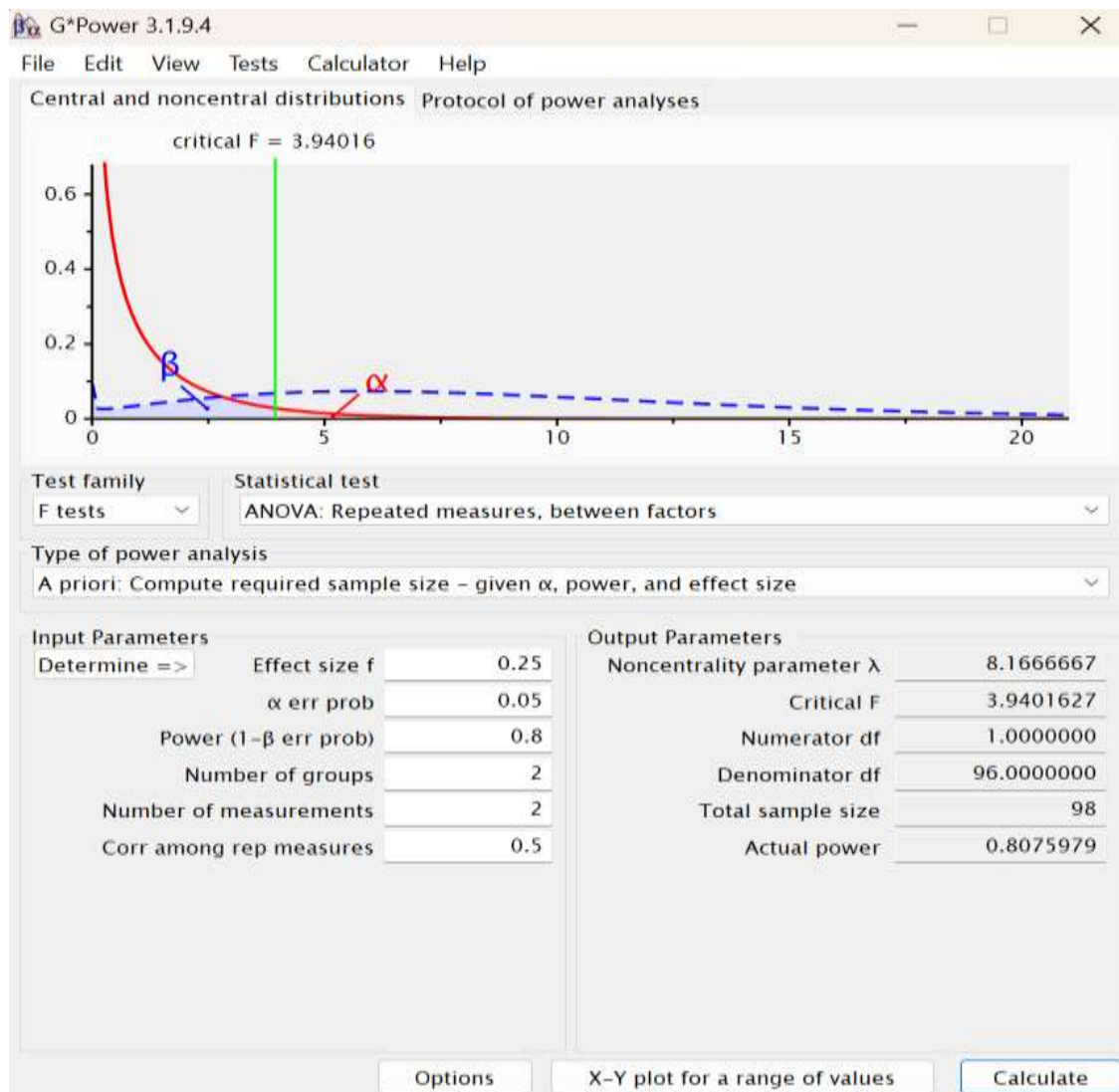


Figure 1: Sample size calculation by using G*Power, ANOVA: repeated measures, between factors.

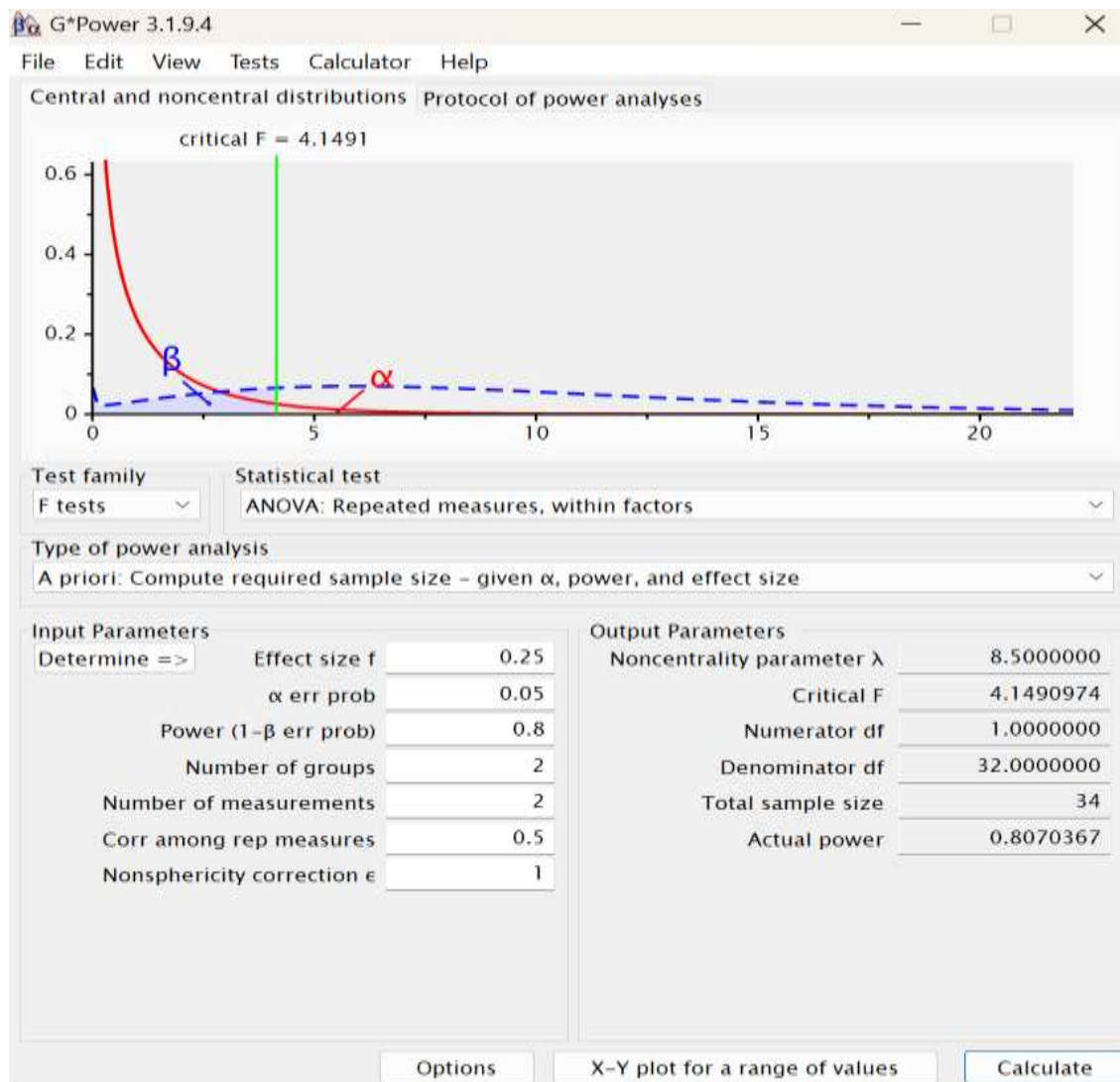


Figure 2: Sample size calculation by using G*Power, ANOVA: repeated measures, within factors.

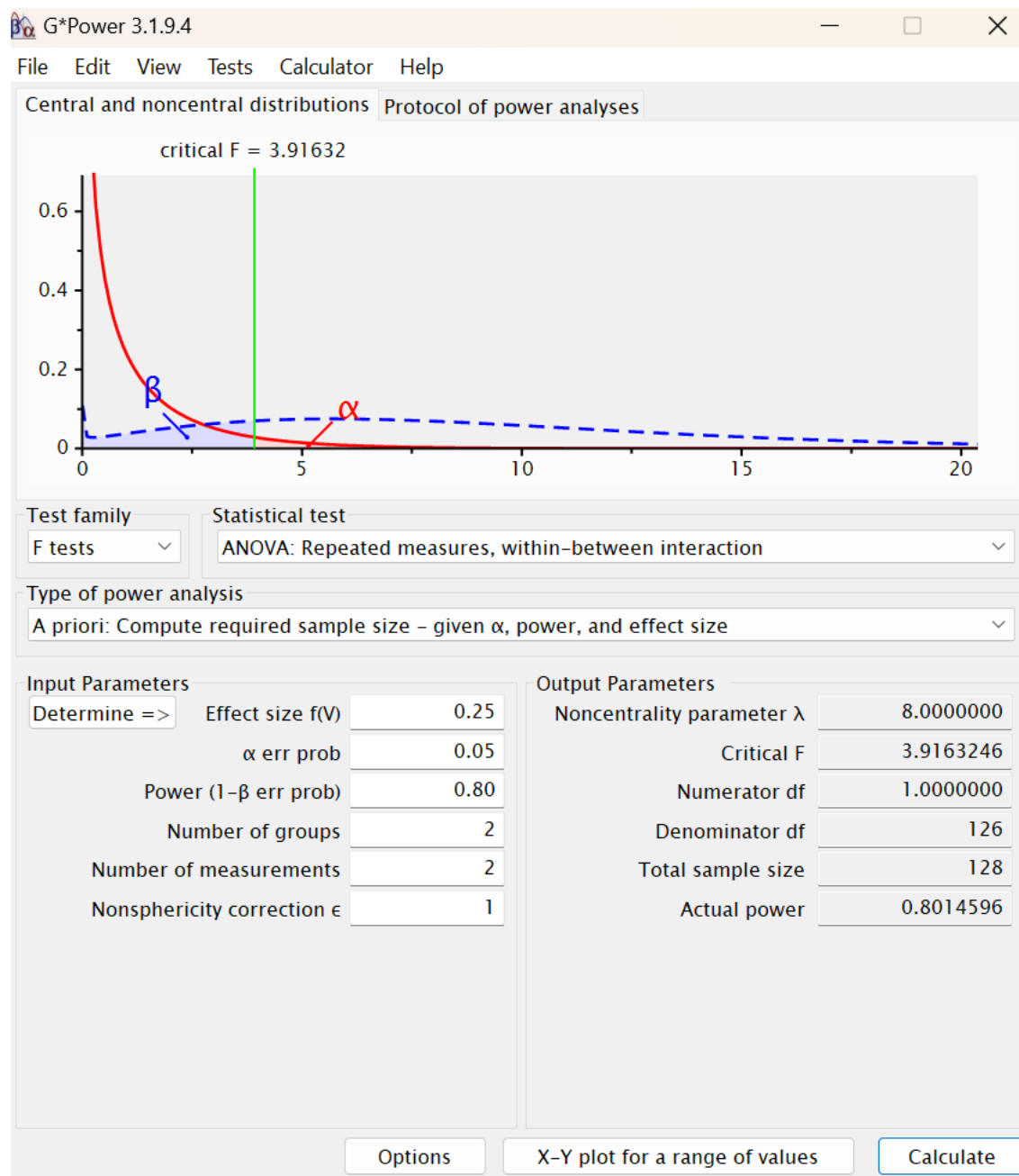


Figure 3: Sample size calculation by using G*Power, ANOVA: repeated measures, within-between interaction.

Data collection for a Cluster Randomized Controlled Trial (Cluster RCT)

Participants will be asked whether they are willing to participate in the study. Those who express interest and volunteer to participate will be recruited by the researcher. Participants will be enrolled throughout the study period and divided into two groups: an intervention group and a control group. A separate WhatsApp group will be created for each study group.

At the commencement of the study, participants in both groups will complete a pre-test using a self-administered questionnaire through Google Forms, which will be distributed via their respective WhatsApp groups. Subsequently, the intervention group will receive a web application health education module related to prostate cancer prevention behaviors, while the control group will not receive the web application health education module. The web application health education module will be delivered to the intervention group through the web application, while WhatsApp will be used as a communication and follow-up platform.

The timing of direct contact and daily follow-up with participants will be organized flexibly after obtaining approval from Middle Technical University and the colleges and institutes involved in the study. Regular follow-up will also be conducted with the intervention group to monitor their progress and support their use of the web application.

The instructional sessions will be conducted over a period of 12 weeks. The first session, conducted through the WhatsApp group, will introduce participants to the study and provide instructions on how to use the web application. Subsequent sessions will provide health education related to prostate cancer prevention, followed by an evaluation at the end of the intervention period.

After completion of the intervention, data will be collected using the same questionnaire administered during the pre-test, delivered through Google Forms. The post-assessment survey will be administered to both the intervention and control groups immediately after completion of the 12-week intervention period.

The intervention will be designed as a health education strategy to assess the effectiveness of the web-based health education module among male university staff. The module will cover a range of strategies for prostate cancer prevention and will be delivered in the Arabic language.

Health education module evaluation

The web application health education module (HEM) will be provided to male university staff in accordance with the participants' informed consent and the relevant institutional requirements. The intervention group will receive a web-based health education programme focused on prostate cancer prevention behaviors. The intervention will be delivered through the web application, while WhatsApp will be used as a communication and follow-up platform.

The intervention will be provided to male university staff who voluntarily choose to participate in the study and provide informed consent by signing the consent form. Participants in the intervention group will be closely monitored and supported throughout the intervention period. The researcher will supervise the delivery of the module and provide the necessary guidance and feedback to the facilitators to ensure the effective use of the web application and adherence to the programme.

The control group will not receive the web application health education programme during the intervention period. To minimize the risk of contamination between the intervention and control groups, randomization will be used to select one college or institute for the intervention group and a different college or institute for the control group. The selected colleges or institutes will be geographically separated where possible. Middle Technical University comprises 17 colleges and institutes distributed across four cities in Iraq, with some colleges and institutes located in the same city but at different locations. Selecting different colleges or institutes, particularly those located in different geographical areas, will help reduce the possibility of participants from the intervention and control groups interacting and sharing the intervention materials.

Statistical analysis

In this phase of the study, data analysis will be conducted using SPSS version 26. All data that is entered will be examined for any possibility of missing values. The study will use a mixed design repeated measures Analysis of Variance (ANOVA) to assess the impact of time, within- and between-group differences, and the interaction between group and time on average scores for knowledge, attitude, and practice.