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EDUCATION

The Impact of Video-Based Educational Intervention on Parents' Decision to Uptake the Measles–Rubella (MR) Vaccine in Jordan

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ABSTRACT

Background: Interventions are needed to decrease measles and rubella (MR) vaccine hesitancy/refusal among Jordanian parents during the implementation campaign in Jordan by 2023. This study developed an educational video for parents with hesitancy or refusal to enhance their attitudes and decisions toward the MR vaccine.

Objective: This study aimed to assess the impact of video-based educational intervention on the attitudes of parents toward the MR vaccine and the decision to accept the MR vaccine.

Method: One group pretest–posttest experimental design was used. A 5-min MR vaccine education video was shown to parents. Parents' decisions on the MR vaccine and the parent attitudes about childhood vaccines (PACV) scale were collected before, immediately, and 2 weeks after the video, the differences in the scores were also measured.

Results: The initial PACV scale score averaged 24 ± 1.5. After watching the MR education video, the PACV scores immediately and after 2 weeks were 21 ± 1.6 and 21.8 ± 1.4, respectively, with a statistically significant difference (p value < 0.05). The parents' likelihood of refusing the MR vaccine decreased immediately and 2 weeks after watching the video (68% and 70.5%; respectively), and this decrease was sustained after 2 weeks (p value $= 0.617$).

Conclusion: An educational video intervention was associated with improved PACV and improved parents' attitudes toward the MR vaccine, potentially altering the decisions of hesitant or refusing parents to accept the vaccine during the 2023 MR vaccine campaign in Jordan. These positive effects appeared to persist even 2 weeks after the intervention.

1 | Introduction

In the Arab nation of Jordan, located in the Middle East, the provision of vaccines without cost to all qualifying children is administered by the primary health sector, the Jordanian Ministry of Health (MOH). The National Immunization Program (NIP) achieved a notable percent vaccination completion rate of 98% for all planned vaccinations, surpassing rates found in

many advanced countries. However, the impact of the COVID-19 pandemic on Jordan's NIP prompted serious outcomes, evident in a measles outbreak in 2023 that led to more than 160 cases being documented (Barakat et al. 2023). In response, the MOH in Jordan launched an extensive immunization drive against measles–rubella (MR) aimed at vaccinating students in educational settings such as schools and kindergartens and children in orphanages and during various events. This initiative began in the middle of October 2023 (Roya News 2023). Although the MR vaccination campaign was critical for public health, it encountered swift contention among Jordanian society. This was primarily due to the spread of audio and video recordings that propagated false and deterring content regarding the MR vaccine (Abdaljaleel et al. 2023; Barakat et al. 2023). Reacting to these inaccuracies, the Jordanian MOH quickly tackled the problem, denouncing the videos as unfounded and taking legal measures to halt their circulation. They firmly highlighted the demonstrated efficacy of the MR vaccine, its thorough approval processes, and its preparedness for distribution within Jordan (Roya News 2023).

Health education interventions that utilize video formats have demonstrated effectiveness in improving comprehension, increasing engagement, fostering behavioral changes, enhancing the ease of access, empowering participants, and exhibiting sensitivity to cultural nuances (Dahodwala et al. 2018; Denny et al. 2017). In general, videos are a valuable resource for conveying crucial health information and fostering favorable health results. In healthcare, video-based interventions can influence individual perspectives by educating, increasing awareness, sharing personal narratives, encouraging behavioral changes, dispelling stigma and misconceptions, and being culturally aware. Through the delivery of engaging and informative material, videos can confront current beliefs and attitudes, resulting in positive shifts in health-related perceptions, beliefs, and behaviors (Tuong, Larsen, and Armstrong 2014).

Several factors driving parental measles vaccination hesitancy, including Parents' concerns about the possible side effects of the vaccine linked to autism, effects on the child's immune system, and well-being (Brieger et al. 2017; Gabis et al. 2022), safety concerns about specific components of the vaccine, and influence of social media platforms that are responsibility for spreading information that questions the safety and efficacy of vaccines (Ames, Glenton, and Lewin 2017; Fadda et al. 2018; Larson et al. 2021; McHale, Keenan, and Ghebrehewet 2016). In addition, parents' lack of knowledge, and their dissatisfaction with the quality of the information received from healthcare professionals (Allan and Harden 2015; Meppelink et al. 2019; Restivo et al. 2015). Moreover, the confusion arising from encountering inconsistent information and experiencing negative emotions, like personal negative experiences or negative reactions to vaccinations (Chung et al. 2017; Sun et al. 2021), along with poor relationships with healthcare professionals, contributes to the situation (Ames, Glenton, and Lewin 2017). Health education plays a crucial part in vaccination efforts, as it elevates public knowledge and reinforces the role of immunizations. It achieves this by enhancing and steering individuals toward a particular level of holistic physical and mental attributes (García-Toledano et al. 2022).

Video-based education interventions have been shown to have a variety of effects on individuals' behaviors. These include increasing knowledge and understanding, promoting behavior change, improving skills acquisition, increasing engagement and motivation, and reducing stigma (Xiao, Wong, and Yang 2023). Videos can be effective in providing visual and auditory explanations, testimonials, and demonstrations, leading to improved awareness, behavior change, and skill development (Zhang et al. 2006).

Additionally, they can be more engaging and entertaining than traditional learning materials, leading to increased motivation. Furthermore, videos can challenge stereotypes and reduce stigma around certain issues, resulting in more empathetic and inclusive behaviors among viewers (Denny et al. 2017; Tuong, Larsen, and Armstrong 2014). So, there is an acute need to develop an approach as a video-based intervention to reduce and address concerns and attitudes of parents toward vaccinations, and more research on the impact of video-based education designed toward parents' vaccine hesitation, which is aimed at ensuring compliance with state-mandatory vaccine requirements in Jordan. Therefore, the objective of this study was to examine the changes in parents' hesitancy toward the MR vaccine and their willingness to allow their child to receive the MR vaccination. This was done by analyzing the average shifts in reluctance levels before, immediately after, and 2 weeks following the introduction of a video-based MR education program among Jordanian parents who were initially against vaccinating their children.

2 | Methods

2.1 | Research Design

A one-group pretest–posttest design was used.

2.2 | Participants

The research gathered information from Jordanian parents with children in schools in Jordan using convenience sampling. According to Raosoft using a 95% for confidence level, 5% for margin of error. For all the students in the chosen schools, the population size was 1360, and with a response rate of 50%, this led to a need for a total sample size of 300 students, incorporating an additional response rate of 20%. Thus, the final size of this study sample was 375 parents who met the criteria including having children in grades 1 to 10, being married, being willing to participate, speaking Arabic, having children without mental or physical disabilities, and refusing the MR vaccine for their children. Parents were completing the survey for only one child, as parents who have resistance toward administering vaccines for one child often have the same attitudes toward their other children.

2.3 | Ethical Considerations

This study was approved by the Institutional Review Board of the Jordanian MOH (Development/plans/83221). All participants gave written informed consent, and their confidentiality was maintained throughout the research process.

2.4 | Instruments

A survey instrument was utilized, comprising demographic details about the parents and students, as well as a parent attitudes about childhood vaccines (PACV) scale to assess resistance levels toward administering the MR vaccine.

2.5 | Demographic Data

Students' information includes gender, class level, family structure, total of family members, birth order, financial status, school type, living place, and routine childhood immunizations. Parental information includes age, child relationship, education level, and job. Moreover, there was a query to determine if parents had approved their offspring to get the MR vaccine, aiming to evaluate any shifts in their stance after the intervention.

2.5.1 | PACV Scale

The PACV is an instrument explicitly designed to identify vaccine-hesitant parents (VHPs) who have under-immunized children. PACV scale is 14 items within three subdomains "Safety and efficacy"; "General attitudes"; and "Behavior" (Opel et al. 2011), each rated on a 4-point Likert scale as: "always," "often," "sometimes," and "never"(Barakat et al. 2023). The scale's internal consistency and reliability were tested and found to be acceptable in the English version, with alpha coefficients > 0.70. The internal consistency for the entire scale was 0.82 (Larson et al. 2015). The scale was also translated into an Arabic version, then tested and found acceptable, with alpha coefficients > 0.70. The internal consistency for the entire Arabic version scale was 0.88 (Barakat et al. 2023; ElSayed et al. 2022). The PACV items were scored 0 = never resistance, 1 = sometimes, 2 = often, and 3 = always resistance, for a minimum score = 0 to maximum score = 42. A higher scores reflect stronger resistance.

2.5.2 | The Video-Based MR Education

The video includes an introduction to the MR vaccine; and explains what vaccines are, how they work, and why they are important for public health. The MR vaccine effectiveness; explain how vaccines are evaluated for their effectiveness in preventing diseases and reducing the spread of infections. The MR vaccine safety; addresses common concerns about vaccine safety, including the rigorous safety monitoring systems in place and the low risk of serious side effects. Debunking MR vaccine Myths; address common misconceptions and myths about vaccines, providing evidence-based information to counter misinformation. The video content on the benefits, effectiveness, and safety of the MR vaccine was reviewed and approved by two public health nurses and two medical experts. The video was presented in Arabic, with the voice of a public health nurse accompanied by relevant pictures and charts consistent with the content of the slides. Approximately 15 slides within 5 min were organized clearly and logically. The video was also edited to ensure high-quality visuals. The video was posted on YouTube to make it accessible on a no-cost video platform, including English subtitles to expand the audience of the educational content. (Link: https://youtu.be/chou5yQBMTg).

2.6 | Data Collection

A link to a three-part section was shared with participants via WhatsApp, Messenger, and Facebook. Participation was voluntary and no incentives were offered. The first section involved assessing the parents' demographic characteristics their decision to uptake the MR vaccine and parents' attitudes toward the MR vaccine. The second section provided video-based education on the MR vaccine, and the third section involved immediately reassessing parents' decision to uptake the MR vaccine and their attitudes toward the MR vaccine with revised item order of the PACV scale to minimize confusion. Participants were required to respond to all items in each section and watch the entire video before being able to proceed to the next section. Two weeks later the third section was resent to participants via WhatsApp, Facebook, and Messenger.

2.7 | Data Analysis

Statistical Package for the Social Sciences (SPSS) version 25 was used to perform all the statistical analyses. A univariate descriptive analysis was conducted to examine the distribution of the sample across the variables under investigation, including measures such as mean and standard deviation or proportions. Kolmogorov–Smirnov test was used to assess the normality of the quantitative variables. Wilcoxon signed-rank test was used for ordinal/interval data and McNemar's test was used for nominal data. The differences in means were measured with a significance level of 0.05 and a CI of 95%. A significance level of $\alpha = 0.05$ was chosen for all statistical analyses, with results having p values below 0.05 considered statistically significant.

3 | Results

A total of 375 participants responded to their demographic information and completed the PACV scale before and immediately after watching the video. While 325 participants responded to the reassessment 2 weeks later.

Student information shows female students were 57.6% and students in high school level were 60.8%. The majority of participants live with a nuclear family, accounting for 89.6%. Families with more than four members were 55.2%. The majority of students were the first or middle on family order (76%). Likewise, governmental schools were predominant, comprising 75.2% of the sample. Most families reported a moderate financial level (64%) and resided in urban areas (64.8%). Notably, all of the children had received their routine childhood vaccines (Table 1).

The parents' information shows half of them are more than 40 years old. A total of 55.2% were mothers of students. The majority of them had received an undergraduate education (53.6%). A significant proportion (55.2%) were not employed in the healthcare sector. However, all of them had decided to refuse the MR vaccine for their child (Table 1).

TABLE 1 | Demographic data at baseline ($n = 375$).

Variable	Category	$N = 375$	%
	Students data		
Gender	Male	159	42.4
	Female	144	57.6
Class	Primary school	147	39.2
	High school	228	60.8
Family type	Nuclear	336	89.6
	Extended	39	10.4
Family members	≤ 4	168	44.8
	> 4	207	55.2
Student's order	First	138	36.8
	Middle	147	39.2
	Last	90	24
School type	Privet	93	24.8
	Governmental	282	75.2
Economic status	High	42	11.2
	Moderate	240	64
	Low	93	24.8
Living place	City	243	64.8
	Village	132	35.2
routine childhood immunizations	Yes	375	100
	No	0	0
	Parent's data		
Age	≤ 40	177	47.2
	> 40	198	52.8
Parent	Father	168	44.8
	Mother	207	55.2
Education level	High school or less	126	33.6
	Undergraduate	201	53.6
	Postgraduate	48	12.8
Occupation	Working (HCW)	96	25.6
	Working (non-HCW)	207	55.2
	Not working	96	19.2

Abbreviation: MR, Measles–Rubella.

Initially, the study involved parents who declined to have their children receive the MR vaccine, indicating that all participants had chosen not to have their children vaccinated with the MR vaccine. Following the presentation of an educational video about the MR vaccine, 32% of the parents decided to change their minds and agree to have their children vaccinated. After 2 weeks, 29.5% of the parents who initially agreed to vaccination maintained their decision ($p = 0.617$) (Table 2).

The initial PACV scale score averaged 24 (1.5). The mean scores for the behavior construct were 8.3 (1.4), for safety and efficacy 9.9 (4.9), and for trust 6.5 (2.2) at baseline. Following the presentation of the MR education video, there was a notable shift in the PACV score (mean = 21 (1.6), p value < 0.05). The behavior construct score decreased to 7.4 (1.5), safety and efficacy to 9.1 (5), and trust to 5.7 (2.2) immediately postintervention, all showing significant changes compared to baseline values (p value < 0.001). Two weeks after the video presentation, the PACV score mean was 21.8 (1.4) and the mean differences compared with the initial score were significant (p value < 0.05) with no significant difference compared to the immediate postintervention values (p value > 0.05). All three domains of PCVA exhibited significant changes compared to baseline values (p value < 0.001), with no significant difference

TABLE 2 | The before, immediate, and 2 weeks after descriptive statistics of the proportion of parent's decision to uptake the MR vaccine.

Decision to uptake the MR vaccine	Before *N* (%)	Immediate[a] *N* (%)	After 2 weeks[a] *N* (%)
Yes	—	104 (32)	96 (29.5)
No	375 (100)	221 (68)	229 (70.5)
Total	375	375	325

[a]The McNemar's test (Immediate/After 2 weeks) p value is 0.617. p value at < 0.05 is considered as not significant.

TABLE 3 | The before, immediately, and 2 weeks after descriptive statistics for the different measurements of PACV domains.

Variables	Before $n = 375$ Mean (SD)	Immediately $n = 375$ Mean (SD)	After 2 weeks $n = 325$ Mean (SD)
PACV score	24 ± 1.5	21 ± 1.6	21.8 ± 1.4
Behavior construct	8.3 ± 1.4	7.4 ± 1.5	7.7 ± 1.6
Safety and efficacy construct	9.9 ± 4.9	9.1 ± 5.0	9.2 ± 4.7
Trust construct	6.5 ± 2.2	5.7 ± 2.2	5.9 ± 2.0

Abbreviation: PACV, parent attitudes about childhood vaccines.

compared to the immediate postintervention values (p value > 0.05) (Tables 3 and 4).

4 | Discussion

Previous studies addressed the parent's perception of the MR vaccine in Jordan exhibited a significant percentage of parents who showed resistance (43.2%), 43.0% expressed hesitancy, and only 13.8% demonstrated acceptance of the MR vaccine (Barakat et al. 2023). Those studies based on their results suggest that immediate and focused actions are necessary to tackle this concern. They recommended implementing mass campaigns that aim to instill confidence in the safety and effectiveness of the MR vaccine (Abdaljaleel et al. 2023; Barakat et al. 2023). Furthermore, effective public health initiatives are urgently needed to ensure widespread measles vaccine coverage and prevent potential outbreaks of this severe illness.

In this study, the author's approach involves utilizing the MR-vaccine educational video as an intervention to influence parents' decisions regarding the MR vaccine and alter their perceptions of it. They employ the PACV scale to gauge parental resistance levels, with notable changes indicating the intervention's effectiveness in improving parents' views and choices concerning the MR vaccine campaign in Jordan 2023. Where, the results test the differences in the parent's decision and the parent's level of resistance (PACV score) three times (before, immediate, and after 2 weeks of intervention). For this reason, the participants who were selected in this study were those who decided to not take the MR vaccine to their child.

The PACV scale in this study shows a nearly higher average than previous studies (24 ± 1.5), that this study's participants were refused the MR vaccine. Highlighted that this group of parents feel differently about the MR vaccine than vaccines in general, evidenced by all of the children having taken routine childhood immunizations (100%). In addition, some PACV items ask about vaccines in general and some items ask specifically about the MR vaccine. Additionally, social media played a crucial role in spreading misinformation among the Jordanian population regarding the safety and advantages of the MR vaccine (Abdaljaleel et al. 2023). Furthermore, mothers were the predominant group in this study, potentially leading to heightened concerns about their children's health (55.2%). Moreover, nonhealthcare workers were the primary participants, indicating a lack of knowledge about vaccines (55.2%).

The three domains of the PACV scale; the behavior construct (8.3 ± 1.4), safety and efficacy construct (9.9 ± 4.9), and trust construct (6.5 ± 2.2) indicated a significant degree of resistance toward the vaccine, demonstrating elevated levels of pre-existing attitudes and scores as observed in prior Jordanian studies (Abdaljaleel et al. 2023; Barakat et al. 2023).

This study proposes a video-based education as a means to enhance parents' attitudes toward the MR vaccine and influence their decision to administer it. Literature provides that multicomponent and dialogue-based interventions were the most effective strategies to address vaccine hesitancy (Jarrett et al. 2015). Health education materials like animated videos and strategies to address concerns and misconceptions about vaccines, ultimately promoting greater acceptance and uptake within the community (Beleites et al. 2023; Kaim et al. 2021; Witus and

TABLE 4 | The mean changes between before/immediate-video intervention, before-video intervention/after 2 weeks, and immediate-video intervention/after 2 weeks.

Comparison	variable	Before	Immediately	After 2 weeks	Z[a]	*p* value
Before vs. Immediately	PACV score	24 ± 1.5	21 ± 1.6	—	−20.9962	0.001
	behavior construct	8.3 ± 1.4	7.4 ± 1.5	—	−15.0939	0.001
	safety and efficacy construct	9.9 ± 4.9	9.1 ± 5.0	—	−17.2728	0.001
	trust construct	6.5 ± 2.2	5.7 ± 2.2	—	−14.4197	0.001
Before vs. 2 weeks after	PACV score	24 ± 1.5	—	21.8 ± 1.4	−19.875	0.001
	behavior construct	8.3 ± 1.4	—	7.7 ± 1.6	−16.184	0.001
	safety and efficacy construct	9.9 ± 4.9	—	9.2 ± 4.7	−16.778	0.001
	trust construct	6.5 ± 2.2	—	5.9 ± 2.0	−15.347	0.001
Immediately vs. 2 weeks after	PACV score	—	21 ± 1.6	21.8 ± 1.4	1.9351	0.054
	behavior construct	—	7.4 ± 1.5	7.7 ± 1.6	1.1695	0.242
	safety and efficacy construct	—	9.1 ± 5.0	9.2 ± 4.7	1.0851	0.261
	trust construct	—	5.7 ± 2.2	5.9 ± 2.0	1.1972	0.231

[a]Wilcoxon sign-rank test.

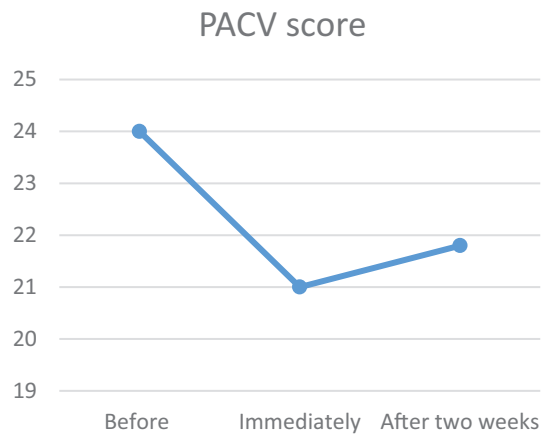

FIGURE 1 | The before, immediately, and 2 weeks after PACV score means. PACV, parent attitudes about childhood vaccines. [Color figure can be viewed at wileyonlinelibrary.com]

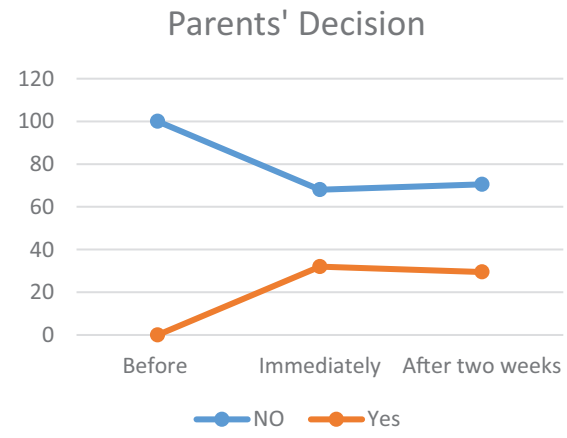

FIGURE 2 | The before, immediately, and 2 weeks after parents' decision. [Color figure can be viewed at wileyonlinelibrary.com]

Larson 2022). A 5-min timeframe was selected to convey a small set of straightforward messages and keep the audience engaged.

This study examined the scores of one group of parents on the PACV scale before, immediately after, and 2 weeks following video-based education on the MR vaccine. The results indicated a significant decrease in PACV score immediately and 2 weeks after the video-based education (21 ± 1.6, 21.8 ± 1.4; respectively, p value < 0.001) (Figure 1), along with notable enhancements in the behavior, safety and efficacy construct, and trust constructs ($p < 0.05$) as shown in Table 4. Moreover, there was a significant proportion of parents who altered their decision to agree to the MR vaccine immediately and after 2 weeks (32% and 29.5%; respectively, $p > 0.05$) (Figure 2). Previous studies have demonstrated that video-based interventions aimed at influencing attitudes and behaviors can lead to substantial improvements and positive outcomes (Dahodwala et al. 2018; Denny et al. 2017; Witus and Larson 2022). The results of this study suggest that utilizing video-based education on the MR vaccine can effectively influence individuals' readiness to receive the vaccine. Additionally, the lasting effects seen 2 weeks posteducation, as reflected in participants' PACV score, behavior construct, safety and efficacy construct, and trust construct,

provide further support for the positive impact of this approach (p value comparing immediate and 2 weeks after > 0.05).

Accordingly, if public health nurses integrate this intervention, it could increase the uptake of MR vaccination and address public vaccine hesitancy. We suggest incorporating such a simple and easily applicable intervention as part of the response to current and future outbreaks that a picture is equal to a hundred words (Wu, Wu, and Wang 2021). Our research is limited by the convenience sample and selection bias. The fact that it only involved one group and was not randomized, resulted in a significant number of participants being lost to follow-up. The absence of a comparison group makes it challenging to determine if the video alone is effective or if the interaction with researchers alone could be sufficient. Including a control group that receives a standard message or a generic health video would allow for a more robust assessment of the video's effectiveness. Therefore, future research investigating similar methods should incorporate a randomized controlled design to enhance the evaluation process.

5 | Conclusion

Recent studies in Jordan have identified vaccine hesitancy as a significant issue regarding the MR vaccine. To address this, researchers propose implementing mass campaigns to build confidence in the vaccine's safety and effectiveness. Researchers recommend Video-based MR Education aimed at influencing parents' attitudes and decision-making regarding the MR vaccine. The video-based intervention would use health education materials and strategies to address concerns and misconceptions, potentially increasing vaccine acceptance and uptake. This study comparing before, immediately after, and 2 weeks after video shown scores of PACV found that the parents showed significant improvements in attitudes and behavior toward the MR vaccine with maintenance. This suggests that integrating such a video-based education could help increase vaccination uptake and combat public vaccine hesitancy.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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