QISTINA: Jurnal Multidisiplin Indonesia
Vol. 1 No. 1 September 2022
P-ISSN: xxxx-xxxx E-ISSN: xxxx-xxxx

# The Effectiveness of Promotional Tools in Making Covid-19 Vaccination a Success: Hypothesis Testing Methods for Changing Cochran's Version

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***Abstract***

*This study aims to examine the effectiveness of promotional tools in the success of the Covid-19 vaccination. In this study, the approach used was quantitative. The quantitative approach method uses hypothesis testing on the Cochran version change. The hypothesis testing method against the Cochran change test was applied to more than two groups of data samples on a nominal value scale or dichotomous ordinal. Basically the testing of this hypothesis is carried out to ensure the presence or absence of significant differences between a number of pairs of frequencies or proportions. The conclusion of this study is a Q value of 3,578, a Q value smaller than the chi-square value in the table of 7.815. Because the Q value is smaller than the chi-square value in the table, the null hypothesis states that the four promotional tools in order to make the Covid-19 vaccination program a success do not have a significant difference in effectiveness. Under these conditions, television, radio, newspapers, and social media have the same level of effectiveness in supporting the promotion of the success of the Covid-19 vaccination program in Indonesia.*

***Keywords:*** *effectiveness, means of promotion, Covid-19 vaccination*



## INTRODUCTION

The coronavirus is a pandemic that is easily spread contagiously. This virus began in Wuhan, China on December 31, 2019 (Yuliana, 2020). This virus can attack anyone who is connected to the virus carrier in a social network (Mona, 2020). The status of a global pandemic or epidemic indicates that the spread of COVID-19 is so fast that almost no country in the world can ensure that it avoids the corona virus (Widiyani, 2020). Covid-19 is a new virus that has caused the world to experience the worst health crisis since the pandemic in 1918 (Moreno et al, 2020).

The potential for spread is magnified when the pattern of infection has reached the community level. The process of community spread shows a fairly poor condition because a person can be infected unknowingly when and where this happens (Yanti et al, 2020). Testing is carried out to identify people who are suspected of being confirmed positive for Covid 19, then tracing is a program to track people who have been in direct contact with Covid 19 patients. Next is the self-isolation program which is a program from the Ministry of Health in order to reduce the spread of Covid 19 (Anindita, 2021).

Since March 2020, Covid-19 has been designated by WHO as the pandemic or the highest spread of disease outbreaks. Efforts continue to be made in various countries, including Indonesia. In an effort to prevent the spread of the Covid-19 virus, the Indonesian government is vaccinating all elements of society. The vaccination aims to reduce the transmission of Covid-19, reduce the rate of morbidity and death due to Covid-19, and achieve herd immunity. Covid-19 vaccination is carried out in health care facilities. The government has also guaranteed the safety of the vaccine because it has gone through rigorous clinical trials. Support vaccination by

remaining disciplined 3M washing hands with soap, using masks, maintaining a minimum distance of 1 meter while still avoiding crowds and limiting mobility.

According to Aco (2020) based on the Decree of the Minister of Health Number H.K.01.07 / Menkes / 9860 / 2020 concerning the Determination of vaccine types for the Implementation of Corona Virus Disease (Covid 19) Vaccination, it is known that six types of vaccines have been determined for the vaccination process in Indonesia. The types are vaccines produced by P.T. Bio Farma (Persero), Astra Zeneca, China National Pharmaceutical Group Corporation (Sinopharm), Moderna, Pfizer-BioNTech, and Sinovac Biotech Ltd.

One of the Indonesian government's efforts to fight Covid 19 is to hold vaccinations for all Indonesians. The Indonesian government is said to have made a roadmap to vaccinateCovid-19 in Indonesia (Fundrika, 2021). However, the upya experienced problems with the emergence of hoax news in various media (Rahayu and Sensusiyati, 2021). Different educational backgrounds, varied environments, and the receipt of diverse messages are certainly opportunities in the spread of hoaxes related to the Covid-19 vaccine (Priastuty et al, 2020).

At the government level, there have been several policy changes in the handling of COVID-19, at the community level several initiatives have emerged to participate in the pandemic response (Sitohang et al, 2020). Community participation plays an important role in various health programs, including currently in efforts to overcome the COVID-19 pandemic (Wu et al., 2020). Efforts at the community level in the context of the COVID-19 pandemic are expected to aim to control the source of transmission, break the chain of transmission, and protect vulnerable population groups (TNCPERET, 2020). Furthermore, strong coordination from the government and a cooperative attitude of the community are needed so that these efforts run effectively and efficiently (Qian et al., 2020).

Based on the background above, this study aims to analyze the effectiveness of promotional facilities in the success of the Covid 19 vaccination, how is the public's acceptance of the promotional facilities carried out by the government in making the Covid 19 vaccination a success, is it true that the four promotional facilities have the same level of effectiveness or are there significant differences in the level of effectiveness?

## RESEARCH METHOD

This study aims to examine the effectiveness of promotional facilities in the success of the Covid 19 vaccination. In this study, the approach used was quantitative. The quantitative approach method uses hypothesis testing of cochran's version changes. The method of hypothesis testing of Cochran change tests is applied to more than two groups of data samples on a dichotomous face value or ordinal scale. Basically this hypothesis testing is applied to ascertain whether or not the difference is significant among a number of sets of frequencies or proportions in pairs. Meanwhile, the observed sample data values are placed in a two-way table consisting of a number of rows and columns (Lukiastuti & Hamdani, 2012).

Conceptually, the nil hypothesis states that the frequency or proportion of a particular answer in each column is the same. Meanwhile, his alternative hypothesis states that the frequency or proportion of a particular answer in each column is different. It can also be said that a number of frequency calls or proportions in pairs do not display a significant difference. Meanwhile, the alternative hypothesis states that a number of sets of frequencies or proportions in pairs display significant differences. Because this method of hypothesis testing of the Change version of Cochran includes a value marked with the letter Q to determine the final conclusion, so it is also called the Q test (Q test).

Determination of the value of Q is sought by applying the formula:

$$Q = \frac{(k-1)\ x\ \left[k\ x\ \left(\sum C_j^2\right)\ x\ \left(\sum R_j^2\right)\right]}{k\ x\ \left(\sum R_j^2\right) - \sum R_j^2}$$

Where Q is the value of Q the result of the calculation, k is the number of columns, Cj is the sum of the overall successes in a column, Rj is the sum of the overall successes in a row.

## RESULTS OF RESEARCH AND DISCUSSION

Related to the success of the Covid-19 vaccination, the Government supports this program by utilizing many promotional facilities, along with the promotional facilities used. Of the several promotional facilities to be carried out research on the effectiveness of promotional facilities including television, radio, newspapers, and social media.

**Table 1. List of Covid-19 Vaccination PromotionAl Media**

| No | Publish Date | Nama Media | File Type |
|---|---|---|---|
| 1 | 14 May 2021 | Video ILM Alur Pelayanan Vaksinasi Covid-19 Dua Meja Versi Lengkap | MPEG-4 Video |
| 2 | 14 May 2021 | Video ILM Alur Pelayanan Vaksinasi Covid-19 Dua Meja Versi 60 Detik | MPEG-4 Video |
| 3 | 03 May 2021 | Video ILM Pesan Tokoh Agama Terkait Manfaat Vaksinasi Covid-19 | MPEG-4 Video |
| 4 | 30 Mar 2021 | Video ILM 60 Detik Vaksinasi Tenaga Kesehatan dan Lansia | Quicktime Video |
| 5 | 30 Mar 2021 | Video ILM 30 Detik Vaksinasi Tenaga Kesehatan dan Lansia | Quicktime Video |
| 6 | 17 Mar 2021 | Video ILM 60 Detik Alur Pelayanan Vaksinasi Covid-19 | Quicktime Video |
| 7 | 17 Mar 2021 | Video ILM 30 Detik Alur Pelayanan Vaksinasi Covid-19 | Quicktime Video |
| 8 | 09 Mar 2021 | Flyer Vaksinasi Covid-19 pada Kelompok Lansia, Komorbid, Penyintas Covid-19 dan Sasaran Tunda | Adobe Portable Document Format / PDF |
| 9 | 02 Mar 2021 | Flyer Seputar Vaksinasi Covid-19 | Adobe Portable Document Format / PDF |
| 10 | 22 Feb 2021 | Poster Vaksin Aman, Halal, Berkualitas Versi Papua | Adobe Portable Document Format / PDF |
| 11 | 15 Feb 2021 | Poster Kunjungi Fasilitas Pelayanan Kesehatan Untuk Vaksinasi Covid-19 | Adobe Portable Document Format / PDF |
| 12 | 15 Feb 2021 | Poster Tahapan Vaksinasi Februari 2021 | Adobe Portable Document Format / PDF |
| 13 | 26 Jan 2021 | Lindungi Diri dan Keluarga dari Covid-19 - Versi Vaksinasi Tenaga Kesehatan | MPEG-4 Video |
| 14 | 15 Feb 2021 | Spanduk Tahapan Vaksinasi Usia Lanjut dan Petugas Pelayanan Publik | Adobe Portable Document Format / PDF |
| 15 | 15 Feb 2021 | Spanduk Tahapan Vaksinasi Februari 2021 | Adobe Portable Document Format / PDF |
| 16 | 15 Feb 2021 | Baliho Vaksinasi Covid Aman, Halal, dan Berkualitas | Adobe Portable Document Format / PDF |

| | | | |
|---|---|---|---|
| 17 | 11 Feb 2021 | Audio ILM Vaksinasi Covid-19 di Pasar | MPEG Audio |
| 18 | 22 Jan 2021 | Alur Pelayanan Vaksinasi Covid-19 | MPEG-4 Video |
| 19 | 09 Feb 2021 | Flyer Menunggu 30 Menit Setelah Divaksinasi Covid-19 | Adobe Portable Document Format / PDF |
| 20 | 08 Jan 2021 | Baliho Lindungi Diri dan Keluarga dengan Vaksin Covid-19 | Adobe Portable Document Format / PDF |
| 21 | 15 Jan 2021 | Baliho Alur Pelayanan Vaksinasi Covid-19 | Adobe Portable Document Format / PDF |
| 22 | 08 Jan 2021 | Baliho Wujudkan Masyarakat yang Sehat dan Produktif dengan Vaksinasi Covid-19 | Adobe Portable Document Format / PDF |
| 23 | 08 Jan 2021 | Baliho Lindungi Diri dan Keluarga dari Covid-19 | Adobe Portable Document Format / PDF |
| 24 | 11 Jan 2021 | Baliho Vaksinasi Covid-19 di Fasilitas Pelayanan Kesehatan | Adobe Portable Document Format / PDF |
| 25 | 06 Jan 2021 | Poster Lindungi Diri dan Keluarga dengan Vaksinasi Covid-19 | Adobe Portable Document Format / PDF |
| 26 | 15 Jan 2021 | Video Lindungi Diri dan Keluarga dari Covid-19 | MPEG-4 Video |
| 27 | 13 Jan 2021 | Spanduk Pencanangan Vaksinasi Covid-19 | Adobe Portable Document Format / PDF |
| 28 | 11 Jan 2021 | KMK Nomor HK.01.07/MENKES/6954/2020 Tentang Perubahan Atas Keputusan Menteri Kesehatan Nomor HK.01.07/MENKES/346/2020 Tentang Tim Penelitian Uji klinis Pemberian Plasma Konvalesen Sebagai Terapi Tambahan Covid-19 | Adobe Portable Document Format / PDF |
| 29 | 11 Jan 2021 | KMK Nomor HK.01.07/MENKES/346/2020 Tentang Tim Penelitian Uji klinis Pemberian Plasma Konvalesen Sebagai Terapi Tambahan Covid-19 | Adobe Portable Document Format / PDF |
| 30 | 07 Jan 2021 | Buku Saku Infovaksin | Adobe Portable Document Format / PDF |
| 31 | 11 Jan 2021 | Paket Advokasi Vaksinasi Covid-19 Lindungi Diri, Lindungi Negeri | Adobe Portable Document Format / PDF |
| 32 | 07 Jan 2021 | SK Dirjen Nomor HK.02.02/4/1/2021 Tentang Petunjuk Teknis Pelaksanaan Vaksinasi dalam Rangka Penanggulangan Pandemi Covid-19 | Adobe Portable Document Format / PDF |
| 33 | 07 Jan 2021 | Permenkes Nomor 84 Tahun 2020 Tentang Pelaksanaan Vaksinasi dalam Rangka Penanggulangan Pandemi Covid-19 | Adobe Portable Document Format / PDF |
| 34 | 08 Jan 2021 | Perpres Nomor 99 Tahun 2020 Tentang Pengadaan Vaksin dan Pelaksanaan Vaksinasi dalam Rangka Penanggulangan Pandemi Covid-19 | Adobe Portable Document Format / PDF |
| 35 | 11 Jan 2021 | Poster Vaksinasi Covid-19 di Fasilitas Pelayanan Kesehatan | Adobe Portable Document Format / PDF |

| | | | |
|---|---|---|---|
| 36 | 11 Jan 2021 | Spanduk Vaksinasi Covid-19 di Fasilitas Pelayanan Kesehatan | Adobe Portable Document Format / PDF |
| 37 | 08 Jan 2021 | Spanduk Alur Pelayanan Vaksinasi Covid-19 | Adobe Portable Document Format / PDF |
| 38 | 08 Jan 2021 | Spanduk Lindungi Diri dan Keluarga dengan Vaksin Covid-19 | Adobe Portable Document Format / PDF |
| 39 | 08 Jan 2021 | Spanduk Wujudkan Masyarakat yang Sehat dan Produktif dengan Vaksinasi Covid-19 | Adobe Portable Document Format / PDF |
| 40 | 08 Jan 2021 | Spanduk Lindungi Diri dan Keluarga dari Covid-19 | Adobe Portable Document Format / PDF |
| 41 | 06 Jan 2021 | Roll Banner Alur Pelayanan Vaksinasi Covid-19 | Adobe Portable Document Format / PD |

On the effectiveness of the four means of promotion, an evaluation was carried out. For this purpose, a survey was conducted on respondents in several areas in Pemalang Regency. Here's an overview of the respondents surveyed.

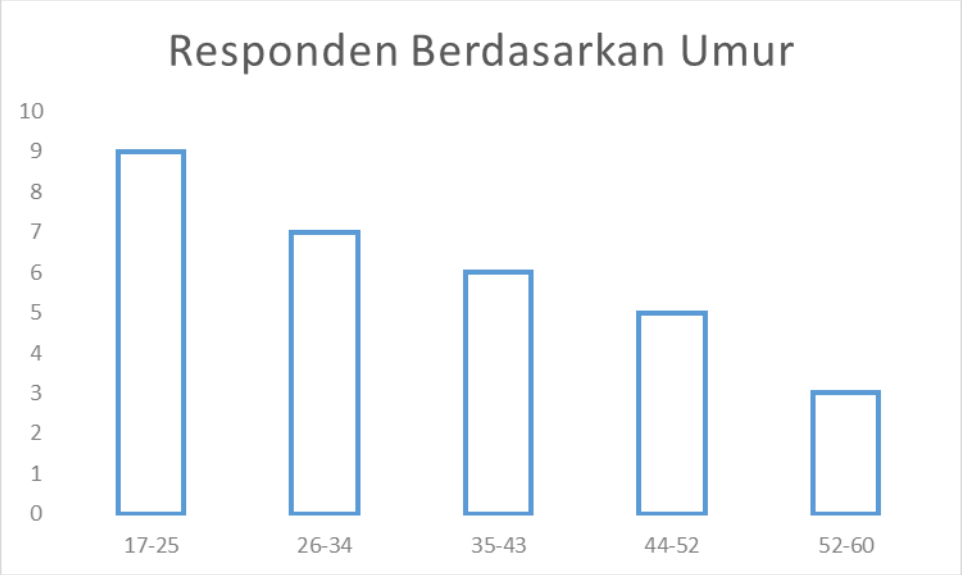


**Figure 1. Description of Respondents By Age**

Based on the classification according to age, respondents are divided into 5 intervals, consisting of 17 to 25 as many as 9 respondents, aged 26 to 34 as many as 7 respondents, ages 35 to 43 as many as 6 respondents, ages 44 to 52 as many as 5 respondents and age intervals 52 to 60 as many as 3 respondents. While the classification by region, respondents were divided into 5 sub-districts in Pemalang Regency including Pemalang, Taman, Comal, Randudongkal and Watukumpul with each region as many as 6 respondents.


**Figure 2. Description of Respondents By Region**

Based on the opinions of the respondents, the assessment of the effectiveness of promotional facilities in order to make the Covid-19 vaccination a success can be known. As for their opinion regarding the effectiveness of all four means of promotion is expressed in the answers "effective" and "ineffective". To facilitate analysis, the answer "effective" is marked with the number 1 and "ineffective" is marked with the number 0. The opinions of the respondents on the effectiveness of the means of promotion are shown in table 2.

**Table 2. Results of a Survey of Respondents on Promotional Facilities in The Success of Covid-19 Vaccineization**

| Reponden | Televisi | Radio | Surat Kabar | Media Sosial |
|---|---|---|---|---|
| 1 | Efektif | Tidak Efektif | Efektif | Efektif |
| 2 | Efektif | Efektif | Efektif | Efektif |
| 3 | Efektif | Tidak Efektif | Efektif | Efektif |
| 4 | Efektif | Efektif | Tidak Efektif | Efektif |
| 5 | Efektif | Efektif | Efektif | Tidak Efektif |
| 6 | Tidak Efektif | Efektif | Efektif | Efektif |
| 7 | Efektif | Tidak Efektif | Efektif | Efektif |
| 8 | Efektif | Efektif | Tidak Efektif | Efektif |
| 9 | Tidak Efektif | Efektif | Efektif | Tidak Efektif |
| 10 | Efektif | Efektif | Tidak Efektif | Tidak Efektif |
| 11 | Efektif | Efektif | Efektif | Efektif |
| 12 | Tidak Efektif | Tidak Efektif | Tidak Efektif | Efektif |
| 13 | Tidak Efektif | Efektif | Efektif | Efektif |
| 14 | Tidak Efektif | Efektif | Efektif | Efektif |
| 15 | Tidak Efektif | Efektif | Tidak Efektif | Efektif |
| 16 | Efektif | Tidak Efektif | Efektif | Efektif |
| 17 | Efektif | Efektif | Tidak Efektif | Tidak Efektif |
| 18 | Tidak Efektif | Efektif | Efektif | Tidak Efektif |
| 19 | Tidak Efektif | Efektif | Efektif | Efektif |
| 20 | Tidak Efektif | Efektif | Efektif | Tidak Efektif |

| | | | | |
|---|---|---|---|---|
| 21 | Efektif | Tidak Efektif | Efektif | Efektif |
| 22 | Efektif | Efektif | Efektif | Efektif |
| 23 | Tidak Efektif | Efektif | Efektif | Efektif |
| 24 | Tidak Efektif | Efektif | Efektif | Efektif |
| 25 | Tidak Efektif | Tidak Efektif | Efektif | Efektif |
| 26 | Efektif | Tidak Efektif | Efektif | Efektif |
| 27 | Efektif | Efektif | Tidak Efektif | Tidak Efektif |
| 28 | Tidak Efektif | Efektif | Efektif | Efektif |
| 29 | Efektif | Efektif | Efektif | Efektif |
| 30 | Efektif | Efektif | Efektif | Efektif |

To answer whether the four means of promotion have the same level of effectiveness or whether there is a significant difference in the level of effectiveness among the four means of promotion, several testing steps must be taken. Here are the steps in testing this study.

Formulating the null hypothesis and the alternative hypothesis, with regard to this case the null hypothesis essentially states that the four means of promotion in order to make the Covid-19 vaccination program a success do not have a significant difference in effectiveness. Meanwhile, the alternative hypothesis states that the four promotional facilities in order to make the Covid-19 vaccination program a success have significant differences in effectiveness. If displayed symbolically, the two hypotheses in this case are formulated as follows:

Ho : $P_{\text{Efektivitas Televisi}} = P_{\text{Efektivitas Radio}} = P_{\text{Efektivitas Surat Kabar}} = P_{\text{Efektivitas Media Sosial}}$

H1 : $P_{\text{Efektivitas Televisi}} \neq P_{\text{Efektivitas Radio}} \neq P_{\text{Efektivitas Surat Kabar}} \neq P_{\text{Efektivitas Media Sosial}}$

Determining the degree of significance, in this case study the level of significance was determined at 5%. The degree of freedom is 3 (4 – 1). In the table, the value of khai-squared for a significance level of 5% and a degree of freedom of 3 is 7.815. The khai-kuarat value of 7.815 is the basis for the formulation of the test criteria and also the final conclusion. Of course, later it must be compared with the Q value.

Formulating the test criteria, the khai-squared value has been known to be 7.815. So that the test criteria imposed on the description of this case are that the null hypothesis is accepted if

$$Q \leq 7{,}815$$

Whereas the null hypothesis is rejected if

$$Q > 7{,}815$$

Furthermore, the procedure carried out is to calculate the value of Q. Q value is calculated by applying the formula already described in the research method. The following is shown a summary of the processing of research data.

**Table 3. Hypothesis Testing Working Table on Cochran Version Changes**

| Reponden | Televisi | Radio | Surat Kabar | Media Sosial | R1 | R12 |
|---|---|---|---|---|---|---|
| 1 | 1 | 0 | 1 | 1 | 3 | 9 |
| 2 | 1 | 1 | 1 | 1 | 4 | 16 |
| 3 | 1 | 0 | 1 | 1 | 3 | 9 |
| 4 | 1 | 1 | 0 | 1 | 3 | 9 |
| 5 | 1 | 1 | 1 | 0 | 3 | 9 |
| 6 | 0 | 1 | 1 | 1 | 3 | 9 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 | 1 | 0 | 1 | 1 | 3 | 9 |
| 8 | 1 | 1 | 0 | 1 | 3 | 9 |
| 9 | 0 | 1 | 1 | 0 | 2 | 4 |
| 10 | 1 | 1 | 0 | 0 | 2 | 4 |
| 11 | 1 | 1 | 1 | 1 | 4 | 16 |
| 12 | 0 | 0 | 0 | 1 | 1 | 1 |
| 13 | 0 | 1 | 1 | 1 | 3 | 9 |
| 14 | 0 | 1 | 1 | 1 | 3 | 9 |
| 15 | 0 | 1 | 0 | 1 | 2 | 4 |
| 16 | 1 | 0 | 1 | 1 | 3 | 9 |
| 17 | 1 | 1 | 0 | 0 | 2 | 4 |
| 18 | 0 | 1 | 1 | 0 | 2 | 4 |
| 19 | 0 | 1 | 1 | 1 | 3 | 9 |
| 20 | 0 | 1 | 1 | 0 | 2 | 4 |
| 21 | 1 | 0 | 1 | 1 | 3 | 9 |
| 22 | 1 | 1 | 1 | 1 | 4 | 16 |
| 23 | 0 | 1 | 1 | 1 | 3 | 9 |
| 24 | 0 | 1 | 1 | 1 | 3 | 9 |
| 25 | 0 | 0 | 1 | 1 | 2 | 4 |
| 26 | 1 | 0 | 1 | 1 | 3 | 9 |
| 27 | 1 | 1 | 0 | 0 | 2 | 4 |
| 28 | 0 | 1 | 1 | 1 | 3 | 9 |
| 29 | 1 | 1 | 1 | 1 | 4 | 16 |
| 30 | 1 | 1 | 1 | 1 | 4 | 16 |
| **Jumlah** | **17** | **22** | **23** | **23** | **85** | **257** |

Based on the working table or data processing obtained the following values:

$C_1 = 17$, $C_2 = 22$, $C_3 = 23$, $C_4 = 23$, $\sum R_j = 85$ , dan $\sum R_j^2 = 257$

Then, the Q value is calculated. In this case study, the value is:

$$Q = \frac{(4-1)\ x\ [4\ x\ (17^2 + 22^2 + 23^2 + 23^2) - (85)^2]}{(4\ x\ 85) - 257}$$

$$Q = \frac{297}{83} = 3{,}578$$

**CONCLUSION**

Based on the calculation procedure above, the conclusion was reached for this study that the Q value is 3.578. The value of Q is less than the value of khai-squared in the table of 7.815. Since the value of Q is smaller than the value of khai-squared in the table, the null hypothesis which states that the four means of promotion in order to make the Covid-19 vaccination program a success do not have a significant difference in effectiveness is accepted. Meanwhile, the alternative hypothesis that states that the four promotional facilities in order to make the Covid-19 vaccination program a success have a significant difference in effectiveness are stated to be rejected. In this condition, television, radio, newspapers, and social media have the same level of effectiveness in supporting promotions to make the Covid-19 vaccination program in

Indonesia a success. It is suggested from this study that more research is needed to ensure that the means of promotion have a better level of effectiveness than the four means of promotion from this study.

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