**A COMPARISON OF MEDIA CHANNELS IN PANDEMIC WARNINGS AND THE CONSENT LEVELS OF VIETNAMESE YOUTHS IN IMPLEMENTING PREVENTIVE MEASURES DURING COVID-19**

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| ABSTRACT  |
| Understanding the characteristics of media channels in health communication will considerably support optimising society's resources. During the pandemic outbreaks with the pervasive coverage of fake news, the governments should use appropriate media types to convey critical health information to the community. Therefore, analysing the effectiveness of media channels in warning disease will provide critical knowledge to aid in pandemic prevention, avoid the collapse of healthcare systems and reduce the risk of losing social control.This study applied Friedman's ANOVA to compare different media types in terms of *'the frequency of receiving disease warnings from'* and *'the usefulness in warning disease'* among4,648 Vietnamese youths. Moreover*,* their *'agreement to implement the preventive measures', 'travel plan adaptations', 'trust in the Government management'* after receiving COVID-19 warnings were also explored. The results revealed that Short Message Service (from the Ministry of Health and other state agencies) and Television/Radio were the two channels frequently reached by young Vietnamese and had the highest usefulness assessments. Furthermore, youths received disease alerts most often from social networks, but this platform was not high-rated for usefulness. The Vietnamese government earned a considerably high trust level from young people, so they were willing to actively cancel their travel plans and adhere to preventive measures following disease warnings. Females had higher consent levels in complying with the health recommendations. Increasing the frequency of receiving disease alerts and the overall perception of the media usefulness were linked to a higher probability of adherence to preventive activities among Vietnamese youths. The findings suggest that managers should focus more on utilising relevant media types in pandemic preparedness and response.**Keywords:** media channels; Vietnam; disease warnings; COVID-19; pandemic. |

1. Introduction

Health communication was an essential component in promoting health-protective behaviours to the community (Tam *et al.*, 2021). However, the vast media penetration and the pervasive coverage of fake news negatively impacted people's health, financial, and psychological state. Moreover, numerous social resources were required to correct the health misinformation (Sommariva *et al.*, 2018; Mohamed-Azzam Zakout *et al.*, 2020; Walter *et al.*, 2020). Thus, the governments and health management organisations should develop effective communication strategies to deliver accurate, useful health messages and achieve desired goals (e.g. rising risk awareness, promoting healthy lifestyles, and empower people with evidence-based disease prevention). Furthermore, by using the communication/persuasion models to assess the effectiveness of communication strategies (McGuire, 1989), the researchers stated the important role of choosing relevant media channels to disseminate health knowledge (Garfin, Silver and Holman, 2020; Paek and Hove, 2020; Ratzan, Sommariva and Rauh, 2020). Specifically, media channels could facilitate health communication when utilised following adequate studies on their characteristics and the target audiences' preferences (Elder *et al.*, 2009).

There were different media types used to spread information and motivate the public to adopt healthy behaviours. For instance, mass media (e.g. television, radio, newspapers, magazines, outdoor and transit advertising, direct mail, and websites) could help the population improve sexual health, reduce sedentary behaviour, and lead to smoking cessation (Stead *et al.*, 2019). In addition, daily newspapers were one of the most influential communication forms for providing lifestyle diseases preventions (Augustine and Harikumar, 2017). Social media offered the possibility of reaching numerous people with critical health information and customising messages to suit viewers' literacy levels and cultural orientations (Wright, 2020). In countries where older mobile phone technology was still the standard, Short Message Service was utilised extensively in health interventions (Toda *et al.*, 2016). Especially, health communication processes might be informal through word-of-mouth (WOM) conversations. WOM based on subjective patients' satisfaction could directly influence the healthcare provider assessments and treatment selection (Martin, 2017). In general, various media types might be used to convey the messages, but the most appropriate channels must be determined by considering the audience's perception of media usefulness and frequency of media exposure (Pinkleton and Austin, 2002).

Social scientists stressed the relationships between media usage and audiences' behavioural change to evaluate health communication initiatives. Furthermore, social and behaviour change communication (SBCC) highlighted the requirements to know which media channels were appropriate for maximising disease warnings' reach and effectiveness (Wikipedia, 2020). As technology advanced, communication channels became more diverse. For example, traditional and interpersonal channels were no longer the only news sources, whereas online or social media, health apps gained more favoured. Consequently, people could rely on several sources as the number of health media platforms enormously expanded. In addition, using various channels enhanced people's exposure to health information and helped them recall those messages more properly (Snyder, 2007). Therefore, the scholars emphasised health media exposure measurements to predict health cognition and behavioural interventions (Romantan *et al.*, 2008). However, according to selective exposure theories, personal characteristics influence each media channel's usage and outcomes (Stroud, 2014). Thus, in the context of health interventions delivered through the media channels, there were reasonable requirements for knowing the receivers' perceptions of media usefulness besides measuring their exposure to health information or the amount of time using each media channel (Pinkleton and Austin, 2002). The usefulness of a media channel in health communication was related to the receivers' judgement on its credibility, feasibility and acceptability to an optimised behavioural intervention. Previous research stated that using appropriate media channels with high usefulness ratings for reacting to a health crisis was critical for reducing the risk of losing social control (Jang and Baek, 2019).

Vietnam is a country in Southeast Asia with a moderate adaptation potential to pandemics, and it was 50th out of 195 economies in the Global Health Security Index list (Johns Hopkins Center for Health Security, 2020; X. T. T. Le *et al.*, 2020). Thanks to the efficient communication strategies that corresponded to the pandemic progression milestones, Vietnam could minimise the damage caused by the COVID-19 (Tran *et al.*, 2020). However, the new strains of Coronavirus have continued to be one of the greatest threats to humanity, causing significant casualties (more than 4.55 million deaths worldwide and over 20.5 thousand deaths in Vietnam from COVID-19) and creating global socio-economic crises. Therefore, analysing the effectiveness of media channels in warning disease will provide essential insights to optimise pandemic prevention resources (Tang and Zou, 2020). Consequently, the population would be empowered to anticipate the problems earlier and implement preventive actions appropriately (Rimal and Lapinski, 2009).

The main goals of this study were to explore:

* The frequencies Vietnamese young people received disease warnings from different media channels;
* The usefulness levels of different media channels in warning diseases;
* The trust of Vietnamese in the government's management in case of the COVID-19 outbreak;
* The relationship between frequencies of receiving warnings, the usefulness of media channels and behavioural adaptations after receiving COVID-19 alerts.
1. Research method
	1. Data collection and questionnaire

Young people were the target population of this study because they were the most vulnerable group regarding the pandemic's social and economic impact (International Labour Organization, 2020). This study used data collected from a survey administered randomly to youths in Vietnam. The sampling process was carried out through 2020. The participants were explicitly informed about this research's purpose, and they could be assured of anonymity. There were proposed media channels to analyse, including Short Message Service from the Ministry of Health and other state agencies (SMS), television/radio, printed media (newspaper, magazine, brochures…), social networks, websites of state agencies, websites of non-state agencies, WOM conversations, bulletin boards on the streets, health apps. All respondents answered the questions concerning:

* *Sociodemographic characteristics* (age, gender, housing type, monthly expenditure…).
* *The frequencies of receiving disease warnings through each media channel*. The respondents chose from 1='Almost never' to 5= 'Always (practically every day)'.
* *The usefulness level of media channels in warning disease*. The respondents answered the question by rating from 1=' Extremely useless' to 5='Extremely useful'.
* *Travel plan adaptions after receiving COVID-19 warnings*. The participants chose between options: 'Cancel', 'Postpone', 'Not postpone, but change the route/destination/transport mode', 'Not change' for some proposed travel plans including Going to study/workplace, Shopping, Hanging-out, Traveling type 1 (go out of the current city because there were pandemic alerts in that city), Traveling type 2 (go to the city where there were pandemic alerts in that city).
* *The trust level in the government's management before and during the COVID-19 outbreak*. Respondents chose between levels: 1='Not trust at all' to 5='Completely trust'.
* *Agreement level to implement prevention actions*. The respondents answered by choosing from 1='Totally not agree' to 5= 'Totally agree' for ten proposed actions (*Report family medical history honestly (including self-report); Report your current health status honestly; Go into mandatory isolation/quarantine as directed by the public health authority if you have symptoms; Practice physical distancing and stay at home if you have symptoms; Take recommended measures to prevent further transmission of the virus to society; Spend more money on purchasing medical equipment to prevent the pandemic; Spend more money on online services (home delivery, online shopping...); Spend money to get vaccinated; Donate to the pandemic prevention fund; Participate in pandemic prevention campaigns in the locality*). Finally, the overall agreement level was calculated by summing all those scores.

There were 4,648 sufficiently informative samples left for data analysis after removing the non-conforming responses.

* 1. Statistical analysis

Descriptive analysis was used to explore the characteristics of respondents. Paired-samples t-tests were applied to compare the trust levels in the government's management before and during the COVID-19 pandemic. Independent-sample t-tests were also carried out to examine the disparity in the trust levels between the two genders. Three questions (*'the frequencies of receiving disease warnings', 'the usefulness of channels in warning disease ',* and *'the agreement to implement the prevention activities'*) were measured by ordinal scales, so the authors used Friedman's ANOVA, a non-parametric tool, to test the hypothesis that there were no significant differences between mean ranks of proposed media channels. Finally, generalised linear modelling (GLM) was applied to predict the overall agreement level to implement the preventative measures given the set of independent variables, including social-demographic information and the respondent's usage of media channels to obtain disease warnings.

1. Results and discussion
	1. Results

The sample included 4,648 young people with a mean age of 20.53 (from 18 to 26 years old), males accounted for 19.5%, and females accounted for 80.5%. More than 50% of them lived in rented rooms, and 36.4% lived with families in their private houses. The majority of respondents spent less than $200 per month, which was consistent with the socio-economic reality of Vietnam. After receiving the COVID-19 alert, most Vietnamese youths cancelled their travel plans, and 52.6% postponed their plans to go to studying/working locations (Table 1).

Table 1. Travel plan adjustments after receiving getting COVID-19 warnings (%).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Travel plan** | **Cancel** | **Postpone** | **Not postpone, but change****the route/destination/transport mode** | **Not change** |
| To work/study places | 39.78 | **52.62** | 6.86 | 0.73 |
| Go shopping | **62.78** | 28.74 | 7.53 | 0.95 |
| Hanging out | **71.86** | 24.85 | 2.73 | 0.56 |
| Travelling type 1 | **78.25** | 20.78 | 0.80 | 0.17 |
| Travelling type 2 | **81.52** | 17.56 | 0.73 | 0.19 |

 The results of the paired-samples t-tests revealed that Vietnamese youth's trust level in the government's management when the COVID-19 pandemic occurring was significantly higher than the period before the pandemic outbreak (4.64±.689 and 4.38±.784, respectively) with t(4,647)=33.52, p<.05. Although the trust level did not improve substantially, it indicated that the government's management in the prevention process against COVID-19 was evaluated more positively (Table 2).

Table 2. Difference between trust levels in the government's management before and during

the COVID-19 period.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Difference between trust levels** | **Paired Differences Mean** | **S.D.** | **Std. Error Mean** | **95% C.I. of the Difference** | **t** | **df** | **p** |
| Lower | Upper |
| During pandemic– Pre-pandemic  | .264 | .538 | .008 | .249 | .280 | 33.52 | 4,647 | .000 |

 Before the pandemic occurred, the independent-samples t-test showed no significant difference in the trust level in the government's management between genders (p=0.26). However, the difference became statistically significant after the occurrence of COVID-19. Young men's trust level was significantly lower than young women's during the pandemic (Table 3).

Table 3. Trust level differences between the two genders.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Trust level difference** | **t** | **df** | **p** | **Mean Difference** | **Std. Error Difference** | **95% C.I. of the Difference** |
| **Lower** | **Upper** |
| Pre-pandemic | 1.12 | 1,346 | .26 | .03 | .03 | -.02 | .09 |
| During pandemic | -3.13 | 1,301 | .00 | -.08 | .03 | -.14 | -.03 |

 Friedman's ANOVA analysis, which was applied to compare the frequencies of receiving disease alerts from media channels, provided ꭓ2(8)=15,481, p<.05. This result suggested there was at least one discrepancy exists between mean ranks (Table 4). Running post hoc test (Friedman's ANOVA analysis for each pair of communication channels) and performing Bonferroni adjustments to p-values (p=.011 x 24= .264), the results showed that the differences between the mean ranks of all pairs were statistically significant, except for one pair: 'SMS 'and 'television/radio'.

Table 4. Frequencies of receiving disease alerts.

| **Channel** | **Mean** | **Mean rank** |
| --- | --- | --- |
| Social network | 4.89 | 6.85 |
| SMS from the Ministry of Health and other state agencies | 4.73 | 6.36 |
| Television/Radio | 4.58 | 6.15 |
| Health apps | 4.44 | 5.90 |
| Word-of-mouth conversations | 4.12 | 5.26 |
| Website of state agencies | 3.92 | 4.75 |
| Website of non-state agencies | 2.23 | 3.67 |
| Bulletin boards on the streets | 3.10 | 3.37 |
| Printed media | 2.51 | 2.68 |

 In terms of the usefulness of media channels in warning diseases, Friedman's ANOVA analysis provided ꭓ2(8)=14,516, p<.05, which revealed that there was at least one discrepancy exists between mean ranks (Table 5). Furthermore, the results of the post hoc test showed that the differences between the mean ranks of all pairs were statistically significant, except for two pairs: 'newspaper/magazines' and 'bulletin boards on the streets', 'social network' and 'health apps' (p≅1).

Table 5. The usefulness of different channels in warning diseases.

|  |  |  |
| --- | --- | --- |
| **Channel** | **Mean** | **Mean rank** |
| SMS from the Ministry of Health and other state agencies | 4.70 | 6.84 |
| Television/Radio | 4.56 | 6.47 |
| Website of state agencies | 3.57 | 6.16 |
| Health apps | 4.25 | 5.64 |
| Social network | 4.25 | 5.63 |
| Printed media | 3.57 | 3.94 |
| Bulletin boards on the streets | 3.53 | 3.81 |
| Website of non-state agencies | 3.32 | 3.44 |
| Word-of-mouth conversations | 3.21 | 3.07 |

Regarding the agreement of young Vietnamese to implement prevention activities, Friedman's ANOVA analysis provided ꭓ2(9)= 9,609, p<.05, which means that there was at least one discrepancy exists between mean ranks (Table 6). The post hoc tests reported that the differences between the mean ranks of all pairs were statistically significant, except for six pairs: (A1, A2), (A1, A3), (A1, A4), (A2, A3), (A2, A4), (A3, A4) (p≅1).

Table 6. Agreement levels to implement different pandemic prevention activities.

| **Code** | **Activity** | **Mean** | **Mean rank** |
| --- | --- | --- | --- |
| A1 | Report your current health status honestly | 4.71 | 6.43 |
| A2 | Go into mandatory isolation/quarantine as directed by the public health authority if you have symptoms | 4.69 | 6.36 |
| A3 | Report your family medical history honestly (including yours) | 4.69 | 6.33 |
| A4 | Take recommended measures to prevent further transmission of the virus to society | 4.69 | 6.32 |
| A5 | Practice physical distancing and stay at home if you have symptoms | 4.59 | 6.05 |
| A6 | Participate in pandemic prevention campaigns in the locality | 4.44 | 5.29 |
| A7 | Spend money to get vaccinated | 4.33 | 4.92 |
| A8 | Donate to the pandemic prevention fund | 4.29 | 4.69 |
| A9 | Spend more money on purchasing medical equipment to prevent the pandemic | 4.12 | 4.42 |
| A10 | Spend more money on online services (home delivery, online shopping...) | 4.12 | 4.18 |

To investigate which factors significantly contributed to the overall agreement level to implement COVID-19 prevention activities, GLM analysis was performed with the seven predictors (age, gender, housing type, monthly spending, trust level in the government's management during pandemics, the total frequency of receiving disease warnings and the accumulated usefulness levels of proposed media channels). Among those predictors, only four variables had significant effects on the agreement level (Table 7). The interactions between variables were not statistically significant. Males have lower consent levels in implementing disease prevention measures than females. Increasing the total frequency of obtaining disease alerts and the overall usefulness of media channels were linked to a higher likelihood of undertaking prevention actions. It is worth noting that the trust level in the government's management was positively substantially associated with the overall agreement level to adherence to preventive measures.

**Table 7. GLM predicting the likelihood of total agreement level to implement prevention activities**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   |   |   | 95% Wald CI |   |   |
| Parameter | B | SE B | LB | UB | Sig. | Exp(B) |
| Gender (Male) | -.86 | .21 | -1.27 | -.46 | .00 | .42 |
| Sum of frequencies of receiving disease warnings | .17 | .08 | .02 | .32 | .03 | 1.18 |
| Sum of usefulness levels of proposed media channels | .32 | .08 | .16 | .47 | .00 | 1.37 |
| Trust level in the government's management after receiving warnings | 3.22 | .12 | 2.98 | 3.45 | .00 | 24.95 |

* 1. Discussion

One of the people's primary concerns was obtaining reliable health information, and the given messages must be relevant to the needs of different socio-economic and demographic groups (H. T. Le *et al.*, 2020). However, most health communication attempts were failed to engage people in healthy behaviours (Neuhauser and Kreps, 2003). The poor results of those initiatives required a further understanding of media channels' properties and comparing their effectiveness in delivering health information. Moreover, identifying the impact of media channels in influencing preventive behaviours is extremely important during pandemic crises. Therefore, this study investigated the exposure frequency, perceived usefulness in disease warnings of different media types and their relationships with adherence to preventive measures in Vietnam during the COVID-19.

Analysing 4,648 Vietnamese youths showed that they received disease alerts most frequently via three channels: social networks, SMS, and television/radio. In addition, young Vietnamese rated three channels (SMS, television/radio, state agencies website) most beneficial for disseminating disease warnings. On the other hand, WOM conversation was the least helpful channel for disease warnings. The results emphasised the opportunity of official channels in motivating the youths to take precautionary measures. The first remarkable point was that young Vietnamese people received disease alerts most frequently from social networks, but this platform was not high-rated for usefulness. It could be explained by the fact that social networks were viral among young people in Vietnam, but these platforms had extensive coverage of fake news (Mheidly and Fares, 2020). Moreover, the Vietnamese government could not entirely monitor the online information sources, contributing to the trust level for social networks was not as high as the official channels. If the Law on Cyber Security (Law No. 24/2018/QH14) was applied more effectively in Vietnam, social media might gain more legitimacy in warning disease to the population. The second point was that young people rarely received diseases warnings through bulletin boards on the streets and newspapers/magazines. As a result, the press publishers and those responsible for installing bulletin boards must consider changing approaches (e.g. content, design, location, timing) to be more accessible to the youth community and avoid wastes.

Vietnamese youth had a high level of trust in the government's management. In particular, their trust level was even higher during the COVID-19 outbreak, demonstrating that pandemic prevention of Vietnam's government was in line with their expectations. Furthermore, young people provided good supports for the government to avoid the spread of COVID-19. For example, after receiving the COVID-19 warning, most young people cancelled unnecessary travel plans (hanging out, shopping) and postponed going to study/workplaces (Table 1). At the same time, they actively adhered to preventive measures (report health status and family medical history, go into mandatory isolation/quarantine if having symptoms, and take recommended measures to hinder the virus's spread to society). The previous study also supported this result, which showed a high adherence to preventive responses to COVID-19 among Vietnamese (Nguyen *et al.*, 2020).

Health communication was considered a non-pharmaceutical therapy through promoting healthy behavioural adjustments (Elder *et al.*, 2009). In pandemic outbreaks, the governments could use health communication to foster prevention by enhancing the public's awareness of the health crisis severity (Jang and Baek, 2019). This study proved that increasing the cumulative frequency of receiving disease alerts and the usefulness of media channels were associated with a higher incidence of adherence to preventive recommendations. Prior research also emphasised the comprehensive exploitation of available channels to increase people's preparedness and ability to make informed decisions during pandemics (Park, Boatwright and Johnson Avery, 2019). To leverage health communication, the governments should prioritise health media channels favoured by the community and simultaneously improve other channels with low levels of accessibility or usefulness. Hence, the government could maintain its leading role and satisfy society's expectations by delivering useful warns in a timely and transparent manner (Jang and Baek, 2019). This might increase people's trust in the government's management and positively impact their compliance with pandemic prevention measures.

The drawback of this analysis was that the sample just consisted of Vietnamese youths. Furthermore, since the research was conducted during the COVID-19 pandemic, respondents' awareness of this pandemic may still be incomplete. Thus, it remains necessary to replicate this research using more representative population samples and apply other data collection methods to validate the findings. Simultaneously, further research was encouraged to explore the comprehensive consequences of adjusting particular travel plans (e.g. shopping, travelling, studying abroad) following pandemic warnings.

1. Conclusion

It was essential to investigate the effectiveness of media channels as a health communication component when facing new, dangerous pandemics, such as COVID-19. This study compared common media platforms in Vietnam and discovered how youths adhere to prevention after receiving pandemic warnings. The results showed that SMS and television/radio were the two disease alert channels most frequently reached and had the highest usefulness assessment by young Vietnamese. Therefore, the government should use these platforms to disseminate disease warnings promptly and simultaneously provide preventive guidance to the youth community. The Vietnamese government's management also earned a high level of trust from youths. Hence, most young Vietnamese were willing to adjust their travel plans and agreed to implement the authority's pandemic preventive recommendations. In conclusion, this article highlighted the need to select appropriate media channels for delivering disease warnings to maximise the young population's exposure and attention. The authors suggest extensive research on adaptations of personal plans and the causal relationships between the factors related to health communication when pandemics occur.

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