Determinants of Intention to Vaccinate Against Covid 19: An Approach Based on the Theory of Interpersonal Behavior

Author's Details:
[(1)]Meryem ZOGHLAMI
Faculty of Economics and Management of Tunis, University of Tunis El Manar.Department of Marketing, Business and Research in Marketing (ERMA)
meryem.zoghlami@fsegt.utm.tn
[(2)]Salma AYEB
Faculty of Economics and Management of Tunis, University of Tunis El Manar.Department of Marketing, Business and Research in Marketing (ERMA)
salma.ay@gmail.com

Abstract
while widespread availability of vaccines is encouraging news for the world's population, a well developed set of strategies is required to promote vaccine acceptance and encourage people to get vaccinated. However, studies have revealed that offering information about vaccines is not the only measure to boost vaccine use and participation. This paper explores the factors impacting the intentions to be vaccinated against COVID-19 based on interpersonal behavior theory (Triandis,1980).

An Internet based survey was conducted. A partial least squares structural equation model has been applied to understand determinants for intention to vaccination against Covid 19 on a sample from the Maghreb countries (mainly from Tunisia and Algeria). Final selection of 226 individuals was conducted using social media, direct email, social networks, and in coordination with community groups. The results of this survey indicate that most respondents are in agreement with vaccination. Efforts to promote vaccination must therefore be continued. They also illustrate the importance of the recommendations of the doctor and family and friends on the intention to be vaccinated. However, the answers to certain questions indicate that a significant proportion of respondents had doubts about the usefulness, effectiveness and safety of the recommended vaccines.

Keywords*: Covid19, intention to vaccinate, psychosocial theories, PLS approach, vaccination promotion.*

INTRODUCTION

The COVID-19 pandemic that has affected the world since January 2020 is now increasing at an alarming rate. In addition to the actions carried out by WHO and the different countries to face this pandemic (monitoring of the pandemic, advice on essential interventions, distribution of vital medical supplies), the process of introducing vaccines anti covid has started in order to develop a safe and powerful weapon to fight covid (WHO,2020) .

As of February 18, 2021, at least seven types of vaccines have been provided to countries via three platforms. Vaccination must be prioritized for vulnerable populations in all countries.

Despite the recommendations of public health authorities, during the vaccination campaign against the Coronavirus, some population groups were more susceptible to be vaccinated than other. (WHO,2020; Bartsch et al,2020; Barello et al, 2020; Harapan et al. 2020).

The Technical Advisory Panel on Behavioral Analysis and Scientific Studies for Health (WHO,2020) has published a report describing the factors influencing people's vaccine behaviors: the vaccination environment, social influences and motivation. This report also suggests that these factors be used to improve community acceptance and vaccination practices in general.

This is the situation in which our work takes place. Its aim is to identify the determinants of intention to vaccinate against covid 19 in order to contribute to the development of strategies for encouraging vaccine acceptance and increasing the vaccination rate in Maghreb countries. The results will lead to a more in-depth

analysis of how to enhance and adapt implementation strategies and communication methods. (Dror et al,2020)

Through a review of the literature, we propose to present the main concepts and put forward the research hypotheses. We will then propose the model to be tested and present the methodology used. Finally, we will present the results and contributions of the research

Literature review and Research Hypotheses

A rich literature has been published around a number of theoretical models for understanding patient behavior in health care (Armitage et Conner,2000 ;Wang 2020). The Theory of Reasoned Action, the Theory of Planned Behavior and the theory of interpersonal behavior are currently the strongest causal models for understanding behavior change.

However, in order to orient the organization of this research in a just direction, Triandis' (1980) theory of interpersonal behavior served as the framework's substructure. This theory complements and enriches the other theories. Indeed, it is very similar to the theory of planned behavior in that it takes into account the attitude towards the behavior, the social norm and the intention as predictors of the adoption of the behavior. It also includes a significant number of concepts formulated by other theories (Godin and Kok, 1996) and has repeatedly demonstrated its effectiveness in the study of various health-related behaviors (Godin *et al*., 1996; Davidson and Jaccard, 1979 , Wong et al 2020).

According to Triandis (1980), behavioral intention is influenced, firstly, by the person's attitude, secondly, by social influences, and thirdly, by an affective factor. Attitude is the objective side of the person, and attitude is affected by two other factors: perceived consequences and personal beliefs. Perceived consequences identify what a person considers to be the positive and negative consequences of the behavior, while personal beliefs represent a person's general perception of the behavior. Social influences are identified as friends and family who can influence decision making (Schepers and Wetzels, 2007). Finally, the affective element refers to the person's feelings and emotions about the behaviour. This theory introduces the notion of "habit" as a predictive factor for the adoption of a behavior.

This model has been used to predict a diversity of behaviours, has been used among populations of various ethnicity and socioeconomic status (Davidson et al ,1976) , and has demonstrated high internal validity in the context of influenza vaccination (Montano, 1986, Takahashi et al ,2003; Vayisoglu and Zincir, 2019).

The cognitive component of attitude: perceived consequences

This is the result of a subjective analysis of the advantages and disadvantages that would result from adopting the behavior. The individual translates into beliefs a number of advantageous and disadvantageous consequences caused by the adoption of a behavior.

According to the theory of reasoned action, every person considers the consequences of his or her actions before deciding whether or not to adopt certain behavior (Ajzen and Fishbein, 1980).

This allows us to assume the following relationship:

H1: Perceived consequences positively influence the intention to vaccinate against covid19.

The affective component of attitude: the affect

According to Triandis (1980), attitude is defined as the feeling of joy, pleasure, mirth, disgust, dissatisfaction or anger that an individual associates with a specific behavior.

Attitude is considered an important predictor of intention to adopt a new behavior (Albani *et al*,2018, Feola and Binder ,2010),. This leads us to assume the following relationship:

H2: Affect positively influences intention to vaccinate against covid19.

Social norms

These are beliefs that inform the importance that a person places on the opinions of those in the entourage regarding the adoption of a new behavior (Schepers and Wetzels, 2007). Indeed, individuals will only be likely to develop a strong intention to act if they believe that those around them would approve of the behavior.

Flynn et al (1994) postulate that consumers trust their circle of friends and family more than other sources of information such as advertising and newspapers. The approval of the entourage may have an influence on the intention and we put forward the following hypothesis:

H3: Social norms positively influence the intention to vaccinate against covid19.

Personal norms

This variable measures the degree of personal obligation to adopt the behavior. This factor refers to personal rules of conduct and moral principles. The person evaluates the closeness of the behavior to his principles. Specifically, this variable refers to rules or beliefs about what constitutes morally approved or disapproved conduct in a given situation (Pillutia and Chen, 1999; Eagly and Chaiken, 1993).

Thus, we assume the following relationship:

H4: Personal beliefs (moral norm) positively influence the intention to vaccinate against covid19.

Vaccination habits

Habit is determined by the degree of automatism that can result from the recurrent execution of this behavior. A study by Seale et al. (2009) concluded that people who received the seasonal flu vaccine were more like are more likely to receive the H1N1 vaccine. Thus, the more experienced the consumer is with vaccinating, the more intent he has to be vaccinated against covid19 (Costes, 2000).

Thus, we assume the following relationship:

H5: Habit to vaccinate has a positive effect on the affective component of attitude towards vaccination.

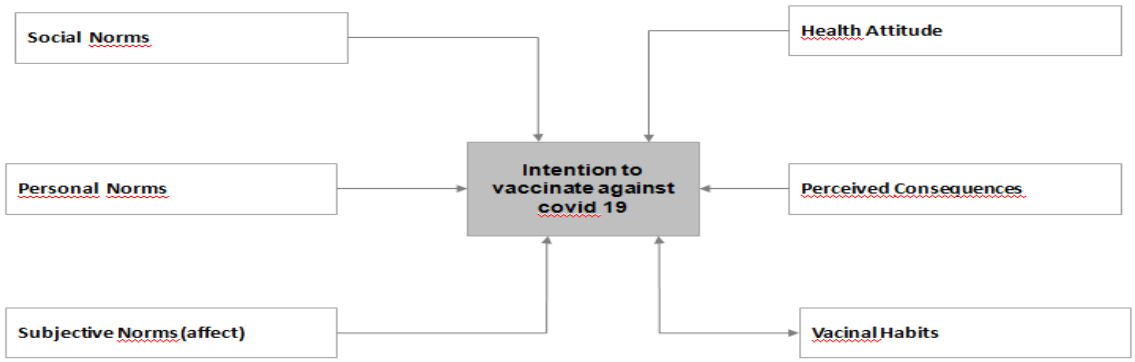
In this research, we used Triandis' (1980) model to assess the determinants of intention to use e-health. As Becker and Mainman (1975) suggested, we added to this model the variable "health relationship" not originally a component of Rosenstock's (1974) model of health beliefs.

Health attitude is a variable adopted from the theory of health beliefs (Rosenstock, 1984). It reflects the fact that the individual should be concerned about his health and consider it an important part of his life. Indeed, attitudes towards health and care are different for each patient. Patients have different ways of managing their health and valuing it to different degrees.

This leads us to assume the following relationship:

H6: The patient's attitude toward health has a positive impact on the intention to vaccinate against covid19.

Figure1: Research model (Based on the model of the Theory of Interpersonal Behavior, Triandis 1980)



METHOD

Survey Method and Sample Description

To achieve the objectives of our study, an online survey was conducted. The questionnaires were distributed online (health forums, social networks,). In view of the diversity of the respondents' profile, we multiplied the sources of diffusion on the internet (sources not necessarily treating of health topics).

The final survey sample consisted of 226 individuals with a chronic disease.

Data collection was conducted in two stages:

- A distribution of the questionnaire by email. An online survey using Google's online survey software generated 59 questionnaires for the first survey. 6 questionnaires were excluded because they were not exploitable or did not meet a previously selected criterion, namely: having an illness that requires long-term care.

-The second part of the survey permitted, after two months of online questionnaire and two relaunches, the collection of 235 questionnaires. We deleted 9 questionnaires because the individuals did not meet the criteria previously retained, thus reducing the sample to 226 individuals in total.

Measurement of study variables

The conceptual framework of our study is based on the model of the theory of interpersonal behavior. It includes items taken from studies conducted by Godin et al. (1999) and based on the work of Ajzen & Fishbein (1980) and Triandis (1980)

Intention is defined by Ajzen & Fishbein (1980; 1975) as the perceived probability of adopting a behavior. Three items were used to measure intention to vaccinate against covid.

The independent variables concern the factors that may affect the intention to vaccinate. These variables represent the psychosocial determinants of individuals' intention to vaccinate and include:

- The subjective component of attitude (affect) towards vaccination was measured in this research by the semantic differentiator method, using pairs of adjectives with affective connotations (Limayem et al, 1999).

- Social norms measured the effect of the family physician, and close family on the decision to vaccinate or not to vaccinate. Influences were measured by a 4-point Likert scale.

-Personal norms refer to personal rules that the individual sets for himself independently of his entourage. In our case, they refer to beliefs concerning the importance of vaccination among respondents. This variable was measured on a 4-point Likert scale.

- The cognitive dimension of attitude measures the perceived advantages and disadvantages of adopting a behavior. The scale for this variable is based on the one developed by Montano (1986) for influenza vaccination. It consists of 11 items partially expressed positively and negatively for the rest, which after purification were reduced to 6 items. The items are measured using a 7-point Likert-type scale.

-Habit is a variable that is usually measured by asking respondents about how often they have done the behavior in the past. In our context, we measured the habit of getting the seasonal flu shot. Three items were used to measure this variable.

For the measurement of the additional variable "health attitude", it is a variable that measures the individual's relationship to health in a general way .We used the scale adopted by Renahy et al (2007) composed of 3 items.

The different items and measurement scales used in the questionnaire are presented in Appendix 1.

RESULTS

The questionnaires obtained were submitted to exploratory analysis at two levels:

At the first level, a Principal Component Factor Analysis (PCA) was conducted, using SPSS 22 software to test the validity of the chosen scale, its dimensionality, as also the reliability of the dimensions.

As reported in Table (1), PCA results indicate that Cronbach's Alpha values exceeded the 0.70 level for all variables. In addition, the KMO (Kaiser-Meyer-Olkin) presents good factor solutions and Bartlett's test is significant (p=0.000). These results attest to the good reliability of our measurement scales.

A second verification of the reliability of the measuring instruments was done by conducting a Confirmatory Factor Analysis using PLS2 software.

Table 1. Results of exploratory analysis

Constructs	KMO	Bartlett	Cronbach's α
Attitude towards health	0.667	0.000	0.904
Social Norms	0.738	0.000	0.897
Personal norms	0.691	0.000	0.859
Subjective norms	0.767	0.000	0.949
Perceived consequences	0.901	0.000	0.945
Vaccination habits	0.706	0.000	0.916
Intention to vaccinate	0.769	0.000	0.964

Validation of the measurement model

Since the subject under consideration is relatively recent, our model is an exploratory and predictive one prior to being confirmatory (Chin and Newsted, 1999), we have opted for structural equation modeling and we chose the Partial Least Squares (PLS) approach.

Based on Table 2, for each latent variable, the value of this internal consistency is higher than 0.8, which indicates that the measures followed in this study are reliable as recommended by Nunnally and Bernstein (1994).

In addition, the composite reliability was examined using the Dillon-Goldstein Rho coefficient of the exploratory factor analysis. The results in Table 1 also show satisfactory results where Rhode D.G. is over 0.8 for all measurement models, following the instructions of Fornell & Larker (1981).

Convergent validity was examined by observing the average variance extracted(AVE). The results show very satisfactory thresholds (>0.8) which attests to good convergent validity.

Table 2: Fidelity and convergent validity indices of the measures

Constructs	AVE	CR	Cronbach'sAlpha	Factor loading
Attitude towards health	**0.839**	0.940	0.903	2.522 0.409 0.069
Social Norms	**0.768**	0.931	0.898	3.087 0.599 0.275 0.039
Personal norms	**0.773**	0.915	0.860	2.346 0.435 0.218
Subjective norms	**0.912**	0.969	0.952	2.738 0.204 0.058
Perceived consequences	**0.794**	0.959	0.948	4.778 0.478 0.232 0.145 0.073
Vaccination habits	**0.856**	0.948	0.916	2.573 0.350 0.077
Intention to vaccinate	**0.936**	0.978	0.966	2.809 0.122 0.069

The discriminant validity of each construct is verified by comparing the square roots of the AVE of the latent variables with the correlation of the other latent variables according to the recommendations of Chin (2010).

Table 3 show that the square root of the AVE of each latent variable exceeds the correlations between the factors, which confirms the discriminant validity.

Table 3: Discriminant validity

Constructs	Attitude	Social Norms	Personal norms	Subjective norms	Perceived consequences	Vaccination habits	Intention to vaccinate
Attitude towards health	**0.915**						
Social Norms	0.100	**0.876**					
Personal norms	0.008	0,114	**0.879**				
Subjective norms	0.270	0,282	0,405	**0.954**			
Perceived consequences	0.004	0.334	0.432	0.285	**0.891**		
Vaccination habits	0.078	0.632	0.163	0.265	0.343	**0.925**	
Intention to vaccinate	0.198	0.506	0.235	0.500	0.384	0.402	**0.967**

The results obtained for the conditions of reliability and validity of the constructs of our model are satisfactory. Indeed, the values of the reliability coefficients obtained are higher than the required thresholds (0.7), the convergent validity (evaluated by the factorial contributions and the average variance extracted) are satisfactory and the discriminant validity (evaluated by the examination of the correlations between constructs and by the cross contributions) are acceptable. The results show that the tested model satisfies all the criteria required for structural model testing.

The structural model: hypothesis testing

All constructs are considered reflective and are measured using multiple indicators. The obtained values of R2, communality and the Q2 index are presented in table 4.

Table 4: Quality of the structural model

Evaluation criteria / Constructs	R2	Communality>0.5 : Good quality model fit	Cross-validation redundancy index (Q2)	GoF
Intention to vaccinate	0.691	0.936	0.647	0.758

The table shows that all R2 values are greater than 0.1 and thus attest to the significance of the model. The analysis of Q2 for all constructs shows positive values which attests to the predictive validity of the model. The GOF we obtain is 0.588, which, referring to the values stated by Wetzels (2009) reveals an overall good quality of the model .

Validation of the hypotheses

Our model is composed of 6 relationships that were tested using the PLS approach using the xl-stat software. The table presents the regression coefficients and Student's t significance coefficients.

Tableau 5 : Path coefficients

Causal Relationship	Coefficients β	Pr >t	T of Student	Validation status of hypothesis
H1 : Attitude toward health→ intention to vaccinate	0.152	0.002	3.162	Validated
H2 : Social norms→ intention to vaccinate	0.348	0.000	5.225	Validated
H3 : Personal norms→ intention to vaccinate	-0.008	**0.896**	-0.131	Invalidated
H4 : Subjective norms→ intention to vaccinate	0.313	0.000	4.835	Validated
H5:Perceived consequences→ intention to vaccinate	0.234	0.000	3.936	Validated
H6:Vaccination habits→ intention to vaccinate	0.020	**0.755**	0.313	Invalidated

As seen, four relationships are significant: The regression coefficients obtained reveal, the positive and statistically significant impact of attitude towards health, social norms, subjective norms (affect) and perceived consequences on the intention to be vaccinated against Covid 19.

We can confirm the acceptance of hypotheses H1, H2, H4 and H5 at a 5% confidence level. It is clear that social norms are a stronger predictor of the intention to be vaccinated against Covid 19 (β =0.348; p=0.000).

Personal norms (β =-0.008; p=0.896) and vaccination habits (β =0.020; p=0.755), do not explain the intention to be vaccinated against Covid 19 in view of the non-significance of the relationship. Hypotheses

H3 and H6 are therefore rejected with insignificant relationships ($p>0.05$) and respective Student's t less than 1.64.

CONCLUSION AND RECOMMANDATIONS

In this research, Triandis' (1980) model was used as background model in the aim of evaluating the factors predicting the vaccination intention. In overall terms and considering the strong proportion of variance explained by the model (69 %), the model obtained is significant.

Social norms and subjective norms (affect) were strong predictors of intention. These results are in accord with those of other studies based on the theory of interpersonal behaviour (Bergeron et al., 1995; Thompson, Higgins and Howelle, 1991). In fact, the maintaining, adopting or abandoning of many behaviors in the population is not only guided by health reasons, but also implies social and emotional factors. Attitude is considered an important predictor of intention to adopt a new behavior (Albani et al,2018, Feola and Binder ,2010),

Our results agree with those of Cumming et al (1979), Fiebach (1991) and Takahashi (2003). These authors studied the psychosocial determinants of vaccination during the influenza pandemic. The authors revealed a strong relationship between physician's recommendations and the act of vaccination, in addition to all social influences. They revealed that the influence of family members has a significant role in influenza vaccination. In our study, social influences are of primary importance in the decision to be vaccinated against covid. Flynn et al (1994) postulate that consumers trust their circle of friends and family more than other sources of information such as advertising and newspapers. The approval of the entourage may have an influence on the intention. In Maghreb society, individuals are basically structured in connection with others, and the most important virtue is to live in harmony with the group, to which they belong.

Nonetheless, given the number of people registered to date for vaccination, there is a great need to make maghreb countries population more aware of the primary role of vaccination in the prevention of corona virus.

The confirmation of the hypothesis linking perceived consequences to the intention to vaccinate reveals that the individual only acts when considering the benefits and disadvantages and when he or she believes that the consequences of the action are positive. This is in agreement with Ajzen and Fishbein (1975) and Yanqiu Yu (2021), who assume that the individual will opt for the alternative choice of behavior that will lead to the desired consequences.

The Ouellette and Wood (1998) article on the effect of past behavior on future behavior states that it is more difficult to change people's behavior if it is not associated with positive short-term effects. In this specific case, vaccination has short, medium and longer-term positive effects. The difficulty is that the effects are not visible to those who are vaccinated. On the other hand, having already had the virus could encourage a person to be vaccinated, as they would have experienced the painful symptoms of covid. This could lead to a positive acceptante of vaccination.

At a theoretical perspective, this research has integrated variables from different empirical and theoretical research from multiple fields (economics, health, psychology, etc.) in the same model in an attempt to better understand the psychosocial determinants of individuals' attitudes towards vaccination during the covid 19 pandemic. Indeed, the study showed that attitude towards health, both social and personal factors and perceived consequences significantly influence the intention to vaccinate. Social norms were found to be the most important variable in determining intention.

The results of the research are designed to improve communication strategies between the government, political authorities, health professionals and the population when developing mass vaccination programs and campaigns.

It is necessary to consider the social, personal and emotional dimensions of the patient's relationship with their health to encourage vaccination. This will require enhancing the quality of prevention messages and

vaccination sensitization content, using positive images and messages about vaccination, supporting the presence and assistance of physicians, encouraging exchange and mutual support, and improving information dissemination strategies to allay people' doubts and uncertainties.

It would also be interesting to examine the population's negative perception of the vaccination campaign, to analyze the psychological barriers of people resistant to vaccination, and to identify the obstacles and decision-making mechanisms.

REFERENCES

Albani .V, Butler T, Traill W B and Kennedy O. B (2018), Understanding fruit and vegetable consumption in children and adolescents. The contributions of affect, self-concept and habit strength, Appetite 120,398-408.

Armitage, C. J., Conner, M.: Social cognition models and health behaviour: A structured review. Psychology & Health. 15(2), 173–189 (2000) doi: org/10.1080/08870440008400299.

Ajzen I, (1991), The theory of planned behavior, Organizational Behavior and Human Decision Processes, 50, 179 211

Ajzen and Fishbein, (1980), cité dans Mc Cormack Brown, K. (1999a). Theory of reasoned action / Theory of planned behavior. Available at: http://hsc.usf.edu/~kmbrown/TRA_TPB.htm).

Ajzen, I. (2001). Nature and operation of attitudes. Annual Review of Psychology, 52, 27-58.

Ajzen,I , and Fishbein, M (1980) , Understanding attitudes and predicting social behavior, Englewood Cliff, NJ, Prentice Hall.

Bartsch SM, O'Shea KJ, Ferguson MC, et al. (2020), Vaccine efficacy needed for a COVID-19 coronavirus vaccine to prevent or stop an epidemic as the sole intervention., Am J Prev Med. 59(4):493-503. doi:10.1016/j. amepre.2020.06.011

Barello S, Nania T, Dellafiore F, Graffigna G, Caruso R.(2020) 'Vaccine hesitancy' among university students in Italy during the COVID-19 pandemic. Eur J Epidemiol. 35(8):781-783. doi:10.1007/s10654-020-00670-z

Bandura, A. and Jourden, F. J. (1991). Self-regulatory mechanisms governing the impact of social comparison on complex decision making. Journal of Personality and Social Psychology, 60, 941-951.

Bélanger D and Godin G (2003), Social Psychology for Public Health and the Environment, In: Environment and Public Health, Foundations and Practices 277- 288, Edisem/Tec et Doc, Acton Vale/Paris

Bergeron, F, Raymond, L, Rivard, S et Gara, S (1995), Determinants of EIS use: Testing a behavioral model. Decision Support Systems, 14, (2), 131-146

Boudokhane. F, (2006) , Understanding technical non-use: theoretical reflections Les Enjeux de l'information et de la communication | http://w3.u-grenoble3.fr/les_enjeux |

Davidson, A. R., Jaccard, J. J., Triandis, H. C., Morales, M. L. & Diaz-guerrero, R. Cross-cultural model testing toward a solution of the etic-emic dilemma. International Journal of Psychology 11, 1-13 (1976).

Davidson, A. R., and Jaccard, J. J. (1979). Variables that moderate the attitude–behavior relation: Results of a longitudinal survey. Journal of Personality and Social Psychology, 37(8), 1364–1376. https://doi.org/10.1037/0022-3514.37.8.1364

Dror AA, Eisenbach N, Taiber S, et al.(2020), Vaccine hesitancy: the next challenge in the fight against COVID-19. Eur J Epidemiol;35(8):775- 779. doi:10.1007/s10654-020-00671

Flynn.L.R, Goldsmith. E.R., Eastman. J.K (1994), The king and summers opinions opinion leadership scale : Revision and refinement, Journal of Business Research, 31, 1, 55- 65

Fiebach N H, Viscoli C M (1991), Patient acceptance of influenza vaccination, The American Journal of Medecine, 91(4):393-400.

Feola.G and Binder C.R (2010), Towards an improved understanding of farmers' behaviour: The integrative agent-centred (IAC) framework, Ecological Economics ,Volume 69, Issue 12, 15 October, Pages 2323-2333

Gagné,C and Godin,G (1999), Social cognitive theories: A guide to variable measurement and questionnaire development, Psychosocial Health Research Group, School of Nursing, Laval University.

Godin G, Sheeran P, Conner M, Gagné C, Blondeau D, Germain, M.D., (2004), Study of the determinants of the intention to donate blood among the general population, Research report presented to Héma-Québec, Université Laval, Québec, Canada

Godin, G. et Kok, G. (1996). The theory of planned behaviour : A review of its applications to health-related behaviours. American Journal of Health Promotion, 11(2), 87-98

Montano, D. E. (1986), Predicting and understanding influenza vaccination behavior, Alternatives to the health belief model. Med Care 24, 438-453.

Harapan H, Wagner AL, Yufika A, et al. (2020). Acceptance of a COVID-19 vaccine in southeast Asia: a cross-sectional study in Indonesia. Front Public Health ;8:381. doi:10.3389/fpubh.2020.00381

Rosenstock, I, Strecher, V J et Baker M H, (1988), Social learning theory and the health belief model, health education quart, 15, 175 -183 .

Pillutia M.M and Chen X.P. (1999), The context of decisions and evoked social norms, organizational behaviour and human decisions processes, vol 27, n 2, p. 81 -103

Seale, H. et al. (2009). Why do I need it? I am not at risk! Public perceptions towards the pandemic (H1N1) vaccine. BMC Infect Dis 10, 99, doi:1471-2334-10-99

Sheeran, P. (2002). Intention-behavior relations: A conceptual and empirical review. European Review of Social Psychology, 12, 1-36.

Triandis, H,C (1980), The self and social behavior in differing cultural contexts, Psychological Review, 96, 506-520

Takahashi et al (2003), Influence of family on acceptance of influenza vaccination among Japanese patients, Family Practice, Volume 20, Issue 2, Pages 162–166

Ouellette, J. A. and Wood (1998), W. Habit and Intention in Everyday Life: The Multiple Processes by Which Past Behavior Predicts Future Behavior. Psychological Bulletin 124, 54-74 .

Vayisoglu SK, Zincir H (2019). The Health Action Process Approach-Based Program's Effects on Influenza Vaccination Behavior. J Nurse Pract;15(7):517-524. doi:10.1016/j.nurpra.2019.04.004

Yanqiu Yu , Sitong Lu , Phoenix Kit-han Mo , Suhua Wang , Junfeng Zhao, Guohua Zhang, Lijuan Li , Liping Li , Joseph Tak-fai Lau. (2021) , Prosociality and Social Responsibility Were Associated With Intention of COVID-19 Vaccination Among University Students in China, International Journal of Health Policy and Management, 1–8.

Wong LP, Alias H, Wong PF, Lee HY, AbuBakar S.(2020), The use of the health belief model to assess predictors of intent to receive the COVID-19 vaccine and willingness to pay. Hum Vaccin Immunother;16(9):2204-2214. doi:10.1080/21645515.2020.1790279

Wang J, Jing R, Lai X, et al. (2020),Acceptance of COVID-19 vaccination during the COVID-19 pandemic in China. Vaccines (Basel). ;8(3):482. doi:10.3390/vaccines8030482

World Health Organization. Manufacturing, safety and quality control of vaccines.

Available at. https://www.who.int/news-room/feature-stories/detail/vaccine-acceptance-is-the-next-hurdle December 4, 2020

World Health Organization. Behavioural considerations for acceptance and uptake of COVID-19 vaccines: WHO technical advisory group on behavioural insights and sciences for health, meeting report, Available at. https://apps.who.int/iris/handle/10665/337335 15 October 2020

Appendix

Measurement scales and items	Mesure Scale	Dimension
Attitude toward health		
You care more about your health than most people	7 levels Likert scale	1
You expect to be healthier in the future than other people you know		
You are easily worried when something goes wrong		
Subjective norms		
To me getting the covid vaccine would be:	7 levels semantic scale	1
Unnecessary/unhelpful		
Disadvantageous/advantageous		
Stressful/relaxing		
Unsatisfactory/Satisfactory		
Social norms		
Your doctor would approve of you receiving the covid vaccine	7 levels Likert scale	1
Your family would approve of you receiving the covid vaccine		
Do your friends recommend that you receive the vaccine?		
Your work colleagues recommend you receive the vaccine		
Personal norms		
I would feel overwhelmed if I do not receive the covid vaccine	7 levels Likert scale	1
It would be a moral obligation for me to be vaccinated.		
I think it would be morally unacceptable not to be vaccinated.		

Measurement scales and items	Mesure Scale	Dimension
Perceived consequences		
If I get vaccinated against covid I will not catch the virus	7 levels Likert scale	1
If I get the covid vaccine it will be painful for me		
If I get the covid vaccine I will have the symptoms of covid		
If I get the covid vaccine other health problems may be aggravated.		
if I get the covid vaccine it will reduce the symptoms of the virus if I get it		
If I get the covid vaccine my other health problems don't get worse.		
Getting the covid vaccine would result in my regular activities not being disrupted because of the virus		
Getting the covid vaccine would result in not giving the virus to freinds or relatives		
if I get the covid vaccine i won't need help from friends, family or the hospital to get over the virus		
To be vaccinated against covid I may encounter problems of mobility or time		
Getting the covid vaccine allows me to visit friends		
Vaccination habits		
Getting vaccinated is natural for me	7 levels Likert scale	1
Getting vaccinated has become automatic for me		
Getting vaccinated has become a habit for me		
Intention to vaccinate		
I intend to receive the covid vaccine	7 levels Likert scale	1
If the opportunity is available, I will be vaccinated against covid,		
I will receive the covid vaccine		