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Application of Health Belief Model on COVID Vaccine Acceptance among Employees University in Namas City

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Abstract **Background**: Awareness of the COVID vaccine and positive beliefs can help in the reduction of coronavirus morbidity and mortality. **Aim:** The study aimed to examine the effect of application of health belief model COVID vaccine acceptance among university employees in Namas City. **Materials and Methods**: quasi-experimental research design. The study was conducted in all faculties of Bisha University at Namas district in south KSA. A convenience sample of Saudi employees taking only one dose and refusal received vaccination against COVID at the University of Bisha, Al-Namas branch. The study was conducted from the beginning of February 2021 to the end of 2021 covering 6 months. Three tools were used to conduct this study: a self-administrated questionnaire first tool,about sociodemographic and COVID vaccine knowledge, second tool was HBM scale and third tool. Three tools questionnaire to assess design making toward vaccination against COVID-19 and what are barrier and hesitancy to receiving the COVID-19 vaccine after implementation educational program. **Results**: Most of the university employees acceptance of COVID vaccine and improved their knowledge and significantly improved HBM constructs compared with the scores before the program (P<0.001). **Conclusion**: After implementation of the nursing educational program about COVID vaccine for Saudi employees, knowledge improved significantly, and there were significant improvements in perceived severity, barriers, benefits, and the cues to action scores after the program compared with the scores before program (P≤0.001). **Recommendations:** Propagation of educational programs based on HBM on COVID vaccine to various age groups would help raise public awareness about COVID vaccine and change to positive beliefs for reduction coronavirus morbidity and mortality.

Keywords: *COVID vaccine, educational program, Health Belief Mode*

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1. Introduction

The coronavirus disease 2019 (COVID-19) pandemic caused a major public health crisis around the world and expected to continue to impose enormous burdens of morbidity and mortality [1,2]. The pandemic poses a significant threat to the public health system, including catastrophic economic consequences around the world furthermore there are currently no specific antiviral treatments for COVID-19 [3,4].

In the end of 2020, the US Food and Drug Administration announced a vaccine to COVID-19 by Pfizer-BioNTech [18]. This authorization was quickly followed by authorizations to other vaccines by Moderna, AstraZeneca/Oxford and Jansen. Immediately after the first vaccine became available, mass vaccination campaigns against COVID-19 were initiated around the world [19].

Despite of the availability of safe and effective COVID-vaccines, some people in different parts of the world is not accepted to get vaccinated, mainly due to dilemma spread of false information and beliefs through social channel media among many people due to the large number of companies that produced the vaccine [5]. Therefore, it is of important priorities to understand the motivators and barriers that influence the general public to vaccinate against COVID-19. Such understanding would help prepare intervention plans based on accessibility to the general public while targeting populations that show a tendency not to get vaccinated [20].

Numerous studies in many countries illustrated that the vaccine acceptance and demand are complex in nature and context-specific, varying across time, place, and perceived behavioral nature of the community [6,7,8]. A study in China showed that some people delay and avoided COVID vaccination due to their misconception, efficacy, and trust in the vaccine [9]. In Hong Kong, anxiety level and vaccine history were the main predictors towards

vaccine acceptancy [10]. Another study in the United States, reported that only 20% intend to decline the COVID-19 vaccine [11].

A study conducted in Saudi Arabia showed determinants of acceptance of COVID-19 vaccination reported that the Participants' perceived risk and trust in the health system were found to be significant predictors towards the intention of the COVID-19 vaccine in the Kingdom [21]. Furthermore, Health education in many studies different targeting socio demographic groups taken as a priority to increase flu vaccine awareness behavior in KSA, and elsewhere [22]. In addition, recent studies showed that trust in the healthcare system and vaccine manufacturing is a crucial component of health education programs that target to promote lifesaving vaccines [12].

Health belief model may aim to increase perceived susceptibility to and perceived the seriousness of a health condition by providing education about the prevalence and incidence of disease, personal estimates of risk, and data concerning the results of sickness (e.g., medical, financial, and social consequences) [23]. Interventions may also aim to alter the cost-benefit analysis of engaging in a health-promoting behavior (i.e., increasing perceived benefits and decreasing perceived barriers) by providing information about the efficacy of various behaviors positive [13].

1.1. Significance of the Study

The COVID 19 pandemic poses a significant threat to the public health system including catastrophic economic consequences around the world. Saudi Arabia has been plagued with several pandemics, including the COVID-19 outbreak. As of the virus has rapidly spread in the Kingdom, causing a total of 341,495 laboratory-confirmed cases with 5144 deaths. COVID-19 vaccine is one of the most successful and cost-effective health interventions to prevent coronavirus. Also, recent studies showed that trust in the healthcare system and vaccine manufacturing is a crucial component of health education programs that target to promote life-saving vaccines. Regular assessment and surveillance of trust levels with a focus on deliberate initiatives to establish trust in immunization programs represent important steps to narrowing vaccine confidence gaps. The community nurse can provide health promotion & psychosocial services include assessment, health education, counseling & appropriate referral.

1.2. Aim of the Study

The aim of the study was to examine the effect of application of belief on COVID vaccine acceptance among employee's university in Namas city. The aim of this study was achieved through the following objectives:

1) To assess the level of university employee knowledge and health beliefs regarding COVID vaccine
2) To implement nursing educational program based on HBM for university employee.
3) To evaluate the effectiveness of the nursing educational program based on health belief model (HBM) on the acceptance of vaccination against COVID-19.
4) Identify the barrier and hesitancy to receiving the COVID-19 vaccine among employee participants after implementation program**.**

1.3. Research Questions

1. Is the nursing educational program based on HBM will improve knowledge about COVID Vaccine among sample study?
2. Is the nursing educational program based on HBM will change health beliefs toward vaccination against COVID-19 among sample study?
3. Do employees after implementing the program receive vaccinations?
4. What are barrier and hesitancy to receiving the COVID-19 vaccine among employee participants after implementation program?

1.4. Subject and Methods

Technical design:

Research Design:

Quasi-experimental research design (one group pre/post) was used in the current study.

1.5. Setting

The study was conducted in all faculties of Bisha University at Namas district. Faculties named Applied Medical Sciences faculty, faculty of Sciences and Arts, and Community faculty.

1.6. Subjects

The subjects of the current study were Saudi administrative staff/security staff/drivers and cleaners in the aforementioned colleges working in Bisha university at Namas district in KSA.

1.7. Sample Size and Sample Technique

A convenience sample of 105 employee was recruited to participate in this study with inclusion criteria Saudi nationality, not received or first dose received from COVID vaccine and agree to participate in the study. The sample size was determined according to the following equation: $N = (Z\alpha)^2 \times pq/d^2$, Sahai and Khurshid, 1996 [24]. The estimated sample sizes will be:

$$N = sample\ size.$$

$Z\alpha$ = the value of standard normal distribution for type I error probability for the sided test and equals 1.96.

p = 26%.

q = 1- p

d^2 = the accuracy of estimate = $(0.05)^2$

1.8. Tools for Data Collection

The following two tools were used for data collection through self-administrated questionnaire:

First tool: self-administrated questionnaire was developed by the researcher in Arabic language after reviewing the literature and experts' opinion; it comprised the following parts:

Part 1-Characteristics of participants:

Firstly, socio-demographic characteristics including age, gender, marital status, residence, educational level, and family income. Secondly, Health History of participants; it was used to assess any one of the participants suffering from chronic disease and diagnosed with Corona virus and received COVID vaccine.

Part 2- Assessment of Knowledge about COVID-19 vaccination: it was used as pre and posttest composed of 20 questions based on Saudi ministry of health guidelines booklet in 2021toward COVID vaccine [25] to assess knowledge level of university employees regarding Covid vaccine (five yes or no, and 15 multiple choice); importance of vaccination, action of vaccine, adverse effect of vaccination and how to deal with it. COVID 19 vaccine benefit, there is relation between COVID vaccine and infertility or any other diseases ...etc.

Scoring system of knowledge: a correct answer was scored "one" and the incorrect "zero". The knowledge score was calculated by adding the scores for the correct answers. The total score of each section was calculated by summation of the scores of its items. The total score for the knowledge of a participant was calculated by the addition of the total score of all sections. The mean and standard deviation was calculated.

Tool (2): Modified Health Belief Model Questionnaire: (Was adapted from Wayne, 2019). Designed to measure employee psychological readiness to take positive action regarding COVID 19 vaccination. It is including five subscales for health belief.

Subscale (1) perceived susceptibility: This refers to an employee subjective perception of the risk of acquiring COIV-19 from vaccination. It consisted of (3) items (i.e., My chance of getting COVID-19 in the next few months is high) ..etc.

Subscale (2) Perceived severity: refer to the negative consequences an employee associate with an event. This subscale consisted of (3) (i.e., The complications from contracting COVID-19 are serious) ..etc.

Subscale (3) perceived benefits: refer to the positive consequences that are caused by a specific action toward COVID vaccine. This subscale consisted of (2) items (i.e., Vaccination decreases my chances of getting COVID-19 or its complications) ..etc.

Subscale (4) perceived barrier: this refers to an employee feeling on the obstacles to performing recommended health action. These subscales consisted of (3) items (i.e., I am concerned about the efficacy of the COVID-19 vaccination). etc.

Subscale (5) cues of action the stimulus needed to trigger the decision-making process to accept a recommended health action. These subscales consisted of (2) items (i.e., I will only take the COVID-19 vaccine if I was given adequate information about it) ...etc.

Scoring system:

The scoring system: A five-point Likert scale to evaluate the statements was used. Positive statements were given a score of agree (2) and disagree (1). Scores of negative statements were inversed as follows: disagree (2) and agree (1). The mean and standard deviation was calculated.

Tool (3) The questionnaire was designed by the researchers to assess acceptance and hesitancy COVID vaccine after implementation education program based on HBM which include two question. first question (closed ended) "was Do you register yourself on the system and take the covid vaccination after attending the educational program" second question (open end question) was what the barrier and hesitancy about is don't receive COVID vaccine.

2. Operational Design

The operational design includes preparatory phase, content validity, reliability, pilot study and field work.

A-Preparatory phase

It includes reviewing of literature, different studies and theoretical knowledge related to COVID 19 vaccine using books, articles, internet, periodicals and magazines.

B- Content validity:

To achieve the criteria of trust worthiness of the data collection tools in this study. Tools were tested and evaluated for content validity by three experts in community health nursing. They were from different academic categories, i.e., professor and assistant professor from faculty of Medicine in Bisha university. To ascertain relevance, clarity, applicability, and completeness of the tools. Based on expert's comments and recommendations, minor modifications had been made such as rephrasing and rearrangements of some sentences.

Tool Reliability:

The reliability of the tools that was assessed through measuring their internal consistency by determining Cronbach alpha coefficient, proved to be high as indicated in the following table:

Tools	Cronbach Alpha Coefficient		
	No. of Items	Scale reliability	Face validity
Knowledge regarding COVID vaccine	12	0.72	0.84
Health belief model	13	0.86	0.89

Ethical considerations: Ethics approval obtained from the University of Bisha Ethics Committee (Ref No: UBCOM/H-06-BH-087(07/01). Therefore, The study sample was informed about the purpose and expected outcomes of the study and they was assured that the study is harmless, and their participation is voluntary, and they have the right to withdraw from the study at any time and without given any reason. They were assured also that anonymity and confidentiality were guaranteed

Pilot Study:

The pilot study was carried out in the beginning of January 2021, before data collection. It was conducted on 10 % of study subjects (10 cases) who were later excluded from the main study subjects to test and evaluate the

clarity, feasibility, and applicability of the research tools and to estimate the time needed to collect data.

Field work:

Before conducting the study, permission was obtained from the administrative director for each faculty to carry out the study. The researchers met the employees, and the aim of the study was explained to them. Their informed verbal consent was secured before collecting data. The study was conducted through four phases: assessment, planning, implementation, and evaluation. These phases were carried out from the beginning of February 2021 to the end of July 2021. The previously mentioned setting visited by the researchers 3 days/week (Tuesday, Wednesday, and Thursday) from 10.00 a.m. to 1.00 p.m. The questionnaires put in Google form and distributed by what sup group. Each week completed from 15 to 20 questionnaires.

Assessment: After finalizing of the tools in pilot study, the researchers met the employees and filled out the questionnaire by google form in mobile to assess knowledge about COVID vaccine, and then the second tool was completed. The data obtained during this phase considered the basis for evaluation of educational program (pretest).

Planning and implementation phase: After identifying the needs of employees in the assessment phase, the researchers developed nursing educational program about COVID vaccine based on HBM constructs with simple Arabic language to be suitable for employees' level of understanding. It emphasized the areas of important of Covid vaccine, action of COVID vaccine and indication. In addition, different types of COVID vaccine, adverse effect of COVID vaccine and how to deal with adverse effect. The employees' participants in each faculty were divided into two groups, with each group including 15 employees. The program was applied through five sessions, and each session lasted 30–40 min. educational program hand-out was distributed to each employee. Teaching methods included small group discussions, open discussion, and brain storming. After the session, additional 5-10 min was offered for answering more questions.

Evaluation: Evaluation phase After implementation of the educational program, its effect was assessed by posttest evaluation. The evaluation was done immediately one time after the program using the same tools of pretest evaluation in addition asking the employees about design making toward vaccination against COVID-19 and what are barrier and hesitancy to receiving the COVID-19 vaccine.

3. Statistical Design

Data analyzed with SPSS, version 18. Descriptive statistical analyses used, all qualitative variables described as numbers and percentages while quantitative variables as mean ± standard deviation (SD). The paired sample t-test used to compare mean scores before and after the intervention.

4. Results

This study designed to examine the effect of application of belief on COVID vaccine acceptance among employee's university in Namas city at south KSA.

Table 1. Distribution of employee According to their Demographic Characteristics (n= 105)

Items	No	%
Age:		
Mean ± SD	37.86 ±9.23	
Gender		
Male	44	42
Female	61	58
Educational level		
Intermediate	26	24.8
Secondary	9	8.6
Bachelor	66	62.8
Master	4	3.8
Occupation:		
Administrative	59	56.3
IT	23	21.9
Security	13	12.3
Worker	10	9.5
Marital status:		
Single	9	8.6
Married	85	81
Divorce	6	5.7
Widow	5	4.6

Table 1 shows that the mean age in the sample were 37.86 ±9.23year, 81% of them were married and 58% of them were female. Regarding the educational level, the study illustrated that 62.8%% of the sample had bachelor education, 24.8% of the sample had intermediate education, and 8.6% was secondary. In this study, 56.3% were administrative employed and 21.9% of the subjects employed in information technology.

Table 2. Distribution of employee according to their health status related to COVID-19 (N=105)

Items	No	%
History of chronic disease:		
No	86	81.9
Yes	19	18.1
Employee diagnosed with COVID-19:		
No	90	85.8
Yes	15	14.2
Receive COVID-19 vaccine:		
Definitely no	75	71.5
First dose	30	28.5

Table 2 demonstrate that 18.1% of the studied sample had chronic disease, 14.2% were diagnosed from corona virus and 71.5% of them do not receive covid vaccine and 28.5% of them received only first dose.

Table 3 illustrates a significant difference in all items of employee knowledge regarding COVID vaccine after program implementation compared to before implementation whereas (P value=0.00000).

Table 3. Distribution of employee According to their knowledge regarding COVID vaccine (n= 105)

Items	Pretest				Post test				Chi squared (P-valued)
	Correct		Incorrect		Correct		Incorrect		
	No	%	No	%	No	%	No	%	
Meaning of corona virous	15	14.2	90	85.8	99	94.3	6	5.7%	85.81 (0.00000)*
Importance of COVID vaccine	8	7.6	97	92.4	99	94.3	6	5.7%	122.48 (0.00000) *
Types of COVID vaccine	3	2.8	102	97.2	102	94.3	3	2.8%	144.45 (0.00000)*
Action of COVID Vaccine	6	5.7	99	94.3	101	96.2	4	3.8%	129.21 (0.00000) *
Indication of COVID vaccine	3	2.8	102	97.2	103	98.1	2	1.9%	107.58 (0.0000)*
Doses of COVID-19 vaccine	3	2.8	102	97.2	101	96.1	4	3.8%	151.01 (0.0000)*
Adverse effect of COVID vaccine	3	2.8	102	97.2	100	95.2	5	4.8	150.93 (0.00000)*
How to deal with adverse effect	6	5.7	99	49.3	105	100.0	0	0.00	177.90 (0.00000)*
Contraindication of COVID vaccine	3	2.8	102	97.2	101	96.1	4	3.8	151.01 (0.0000)*
Effect of COVID vaccine on woman fertility and pregnancy	0	0.00	105	100	94	89.5	11	10.5	133.30 (0.00000)*
Is the vaccine given with blood clotting drugs and pts with hemorrhagic disease	0	0.00	105	100	103	98.1	2	1.9	160.76 (0.00000)*
Should you continue to wear a mask and social distancing after taking the vaccine	4	3.8	101	96.2	105	100.0	0	0.00	137.45 (0.00000)*

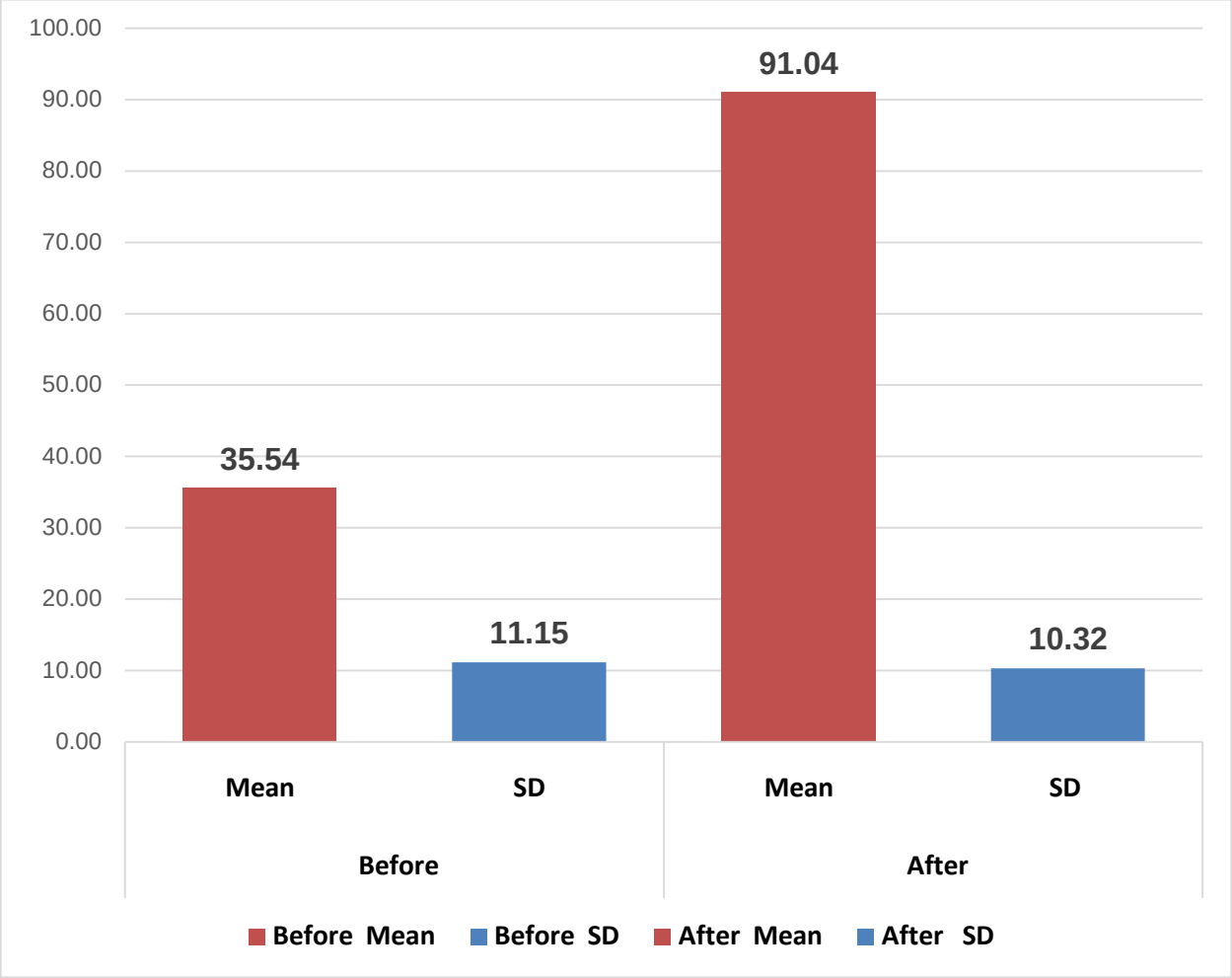

Figure 1. Difference between total mean score of employee knowledge regarding COVID vaccine before and after implementation program (N=105).

Figure 1 reveals that the mean score of total knowledge before implementation is 35.54±11.15, while the mean score of total knowledge after implementation is 91.4±10.32. Thus, the figure shows the answer of the first research question related to improvement knowledge level about COVID vaccine.

Table 4. Comparison of the studied employee regarding COVID vaccine based on Health Belief model before and after program implementation (N=105).

Health Belief Model	Before program				After program				Chi square (P-value)
	Agree		Disagree		Agree		Disagree		
	No	%	No	%	No	%	No	%	
Perceived susceptibility									
My chance of getting COVID-19 in the next few months is high	65	61	40	39	26	**24.7**	79	**75.3**	38.59 (0.00000)*
I am worried about the likelihood of getting COVID-19	68	64.7	37	35.3	38	**36.1**	69	**65.9**	49.31 (0.00000)*
Getting COVID-19 is currently a possibility for me	28	26.6	77	73.4	91	**86.6**	14	**13.4**	57.24 (0.00000)*
Perceived severity									
The complications from contracting COVID-19 are serious	84	80	21	20	14	13.4	91	86.6	104.75 (0.00000)*
I will be very sick if I get COVID-19	96	91.4	9	8.6	14	13.4	91	86.6	134.91 (0.00000)*
I am afraid of getting COVID-19	80	76.1	25	23.9	19	18.1	86	81.9	93.09 (0.00000)*
Perceived benefits									
Vaccination is a good idea because it makes me feel less worried about catching COVID-19	55	52.3	50	47.7	78	74.2	27	25.8	56.18 (0.00000)*
Vaccination decreases my chances of getting COVID-19 or its complications	67	63.8	38	36.2	91	86.6	14	13.4	68.59 (0.00000)*
Perceived barriers									
I worry the possible side-effects of COVID-19 vaccination would interfere with my usual activities	66	62.8	39	37.2	17	16.2	88	83.8	74.67 (0.00000)*
I am concerned about the efficacy of the COVID-19 vaccination	75	71.5	30	28.5	14	13.4	91	86.6	70.94 (0.00000)*
I am concerned about the safety of the COVID-19 vaccination	76	72.4	29	27.6	35	33.6	70	66.4	19.49 (0.00000)*
Cues to action									
I will only take the COVID-19 vaccine if I am given adequate information about it	40	38.1	65	61.9	70	66.4	35	33.6	40.25 (0.00000)*
I will only take the COVID-19 vaccine if the vaccine is taken by many in the public	85	81.9	20	19.1	39	37.2	66	62.8	85.17 (0.00000)*

Table 4 shows a significant difference between before and after implementation of health belief model in all components (P value =0.00000).

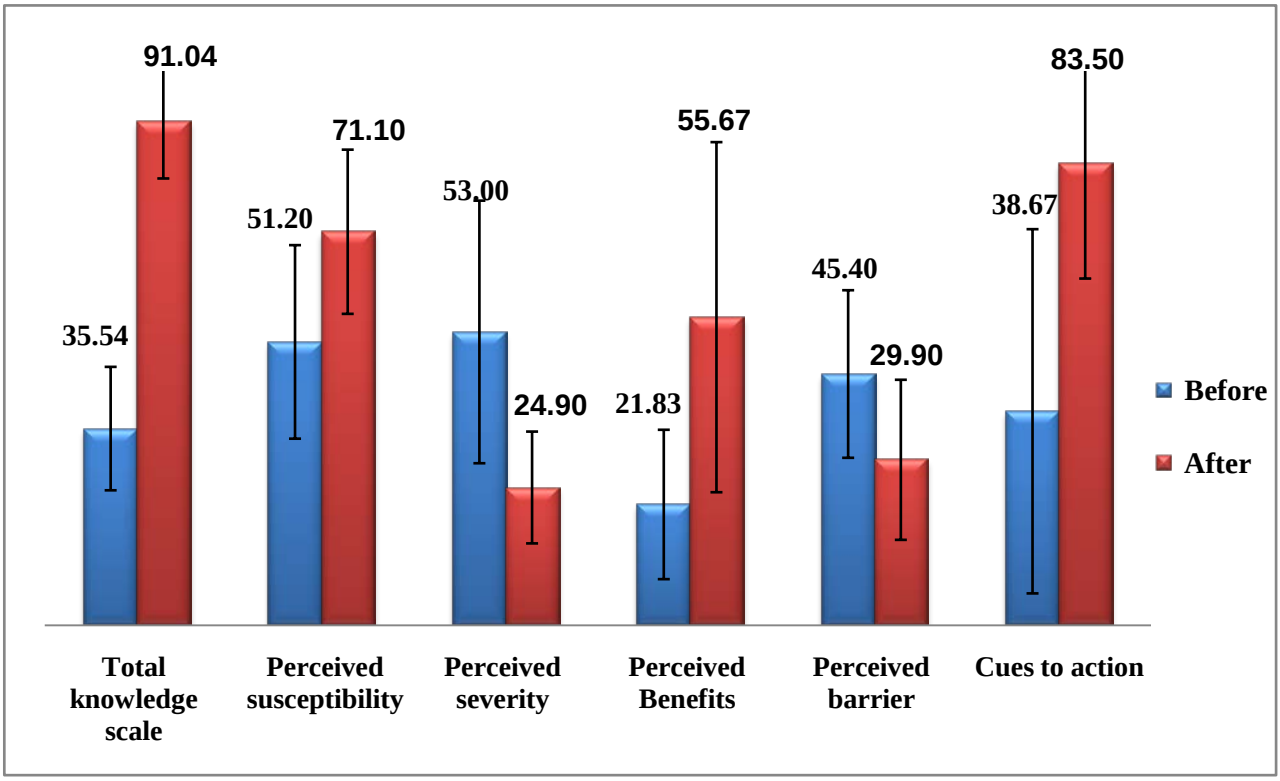

Figure 2. Difference between total mean score of knowledge and HBM components before and after implementation program (N=105)

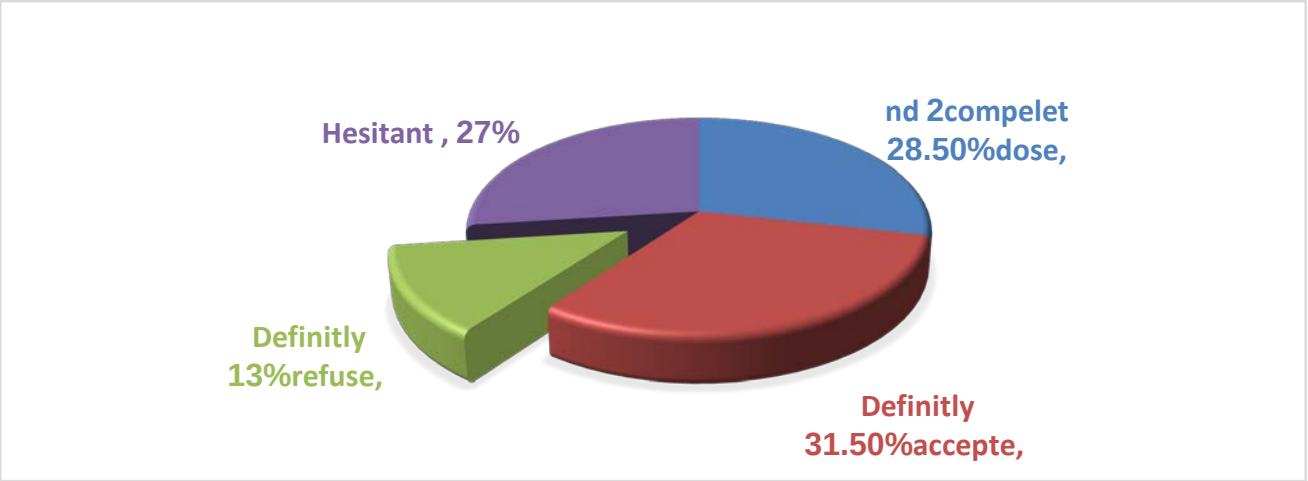

Figure 3. Distribution of employee acceptance status about vaccination against COVID-19 after implementation program (N=105)

Figure 2 illustrates the improved total score of knowledge regarding COVID vaccine among employee under the study sample, after implementation educational program based on HBM observed positively change health beliefs about COVID vaccine in perceived susceptibility, perceived benefits, and cues to action. Table shows also reduce in negative belief in perceived severity, and perceived barrier. Thus, the figure shows the answer of the second research question related to changing health beliefs about COVID vaccine.

Figure 3, Demonstrates that acceptance status of employee under study sample 28.5% will complete second dosed of COVID vaccine, 31.5% of them definitely accepted vaccination against COVID. Despite the reported 27% of them hesitancy and 13% definitely refused COVID vaccination.

Table 5. Distribution of barrier and hesitancy to receiving the COVID-19 vaccine among employee participants after implementation program (N=42)

Items	No	%
Doubt in vaccine safety	9	21.4
Fear of unknown adverse effects	8	19%
Fear of long-term genetic effects of some vaccine types	11	26.2
Fear of (nanochips) implantation via the vaccine	20	47.6
Insufficient trust in the vaccination source (producer)	5	11.9
Desir to pregnancy	4	9.5

Number not mutually exclusive.

Table 5 shows that the most-reported barriers and hesitancy of COVID-19 vaccination were 47.6% fear of long-term genetic effects of some vaccine types and 26.2 % fear of (nano chips) implantation via vaccine followed by 19% fear of unknown adverse effects, thus this table answered on forth research question related to barrier and hesitancy to receiving the COVID-19 vaccine.

5. Discussion

Vaccine refusal and hesitancy is a limiting step in global attempts to control the current pandemic with its adverse health and socioeconomic consequences. The current study designed to examine the effect of application of Health beliefs model on COVID vaccine acceptance among employee's university in Namas city. We found that the majority of studied employee does not accept the vaccine, whereas a recent cross-sectional survey in the KSA found that the percentage of respondents who would definitely accept the vaccine to protect themselves from COVID-19 was more than quarter definitely yes and one third probably yes [14]. In comparison with the respondents in the UK and US reported they would definitely not accept a COVID-19 vaccine less than one quarter [15]. Our study revealed that the average age group is 37 years. In many recent studies in Ireland and the United Kingdom, 18–24 years old were more reluctant to receive the COVID-19 vaccine [16]. Our study revealed that less than quarter of studied employees who were previously infected with COVID-19 which was similar to the findings of other studies in Saudi Arabia [17].

Regarding employee s knowledge on COVID vaccine, the present study revealed that all the employees had poor knowledge score about COVID vaccination before the program, which improved drastically after the program. This might be related to the effect of the nursing educational program on knowledge. These study findings supported the study research question number one that the nursing educational program based on HBM for university employee about COVID Vaccine will improve knowledge scores about COVID vaccination. These findings agreement with the study in Egypt who reported that the mean score of knowledge before the intervention was low regarding Pap smear and cervical cancer, whereas after the educational intervention, the level of knowledge improved significantly [16,18]. Moreover, the current study was similar with the study in Malisa who stated that the students in Malaysia had poor knowledge level of cervical cancer and its prevention [19]. This might be related to needs of educational programs to improve cervical cancer knowledge and awareness of the public.

Regarding the mean scores of constructs of HBM, the present study found to be significant difference between before and after implementation of health belief model in all components. application of educational program improved positively change health beliefs about COVID vaccine in perceived susceptibility, perceived benefits, and cues to action. Therefore, reduce in negative health belief in perceived severity, and perceived barrier. Moreover, the nursing educational program might increase the awareness

toward COVID vaccination. These study findings supported the study hypothesis number two that the nursing educational program based on HBM will change health beliefs positively toward COVID vaccination. Similar HBM outcomes were also found in a study performed in Japan, these findings suggested that the constructs of HBM could be used to explain vaccine uptake behaviour, as in previous studies demonstrating the capability of the HBM constructs in predicting behaviours related to influenza vaccination [12]. While cues to action is an important element of HBM and they were found to be a significant driving force of vaccine acceptance, we found a remarkable pattern for COVID-19 vaccine. However, because of the lack of knowledge and too many manufacturers all comet once, it is more likely for potential vaccine recipients to doubt the legitimacy of less well-known manufacturers, which could intern lower their vaccine acceptance. Government should also proactively provide information about their selected vaccine manufacturers to break this barrier.

Notable, we clarified that a key component of HBM perceived susceptibility to Corona virus infection was not associated with COVID vaccination acceptance. These points could be illustrated by the majority of people belief in COVID-19 is perceived as a mild disease unless the infected person has chronic conditions. This guidelines of the direction of awareness and education for COVID-19 vaccine might have to be different from other vaccines in which prevention of infection is perceived as the main intention. Rather, perceived severity being a significant factor should be a focus for vaccine campaigns.

In our study, the most of employees accepted to receive COVID-19 vaccines after implementation program. This agreed with the study in US whose study showed that HCWs who are vaccinated against COVID-19 after giving information about COVID vaccine [26]. The results agreed with other studies where the odds of acceptance of vaccination after lecture session based on HBM about COVID vaccine [10]. From my point of view, the acceptance of vaccination by the participants resulted from expectation about vaccination obligatory that to facilitate travel, transportation, and back normal life.

Regarding barriers and hesitancy to receiving the COVID - 19 vaccine were fear of long - term genetic effects of some vaccine types and fear of (nano chips) implantation via vaccine. This agrees with the study in Egypt whose study showed that reasons of not accepted vaccination against COVID among HCWs [26]. The results agreed with other study other study in Egyptian medical student where the main vaccination barriers were insufficient information regarding the vaccine and its potential adverse effects [27]. From my point of view, the various types of vaccines produced from most countries, and false announcement on social media network, was a major reason for people's reluctance to take vaccines.

6. Conclusion

According to the results and research questions of the current study, the nursing educational program regarding acceptance of COVID vaccine among university employees improved their knowledge and significantly improved HBM constructs compared with the scores before the program ($P<0.001$).

7. Recommendations

On the basis of the results of this study, the following recommendations are proposed:

1. Propagation of educational programs should be initiated to raise public awareness about COVID vaccine
2. Further research is needed on a wide scale to assess the barriers of undertaking negative beliefs about COVID vaccine

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