

Irrational thoughts and its relationship to the Covid 19 vaccine acceptance among healthcare workers.

الأفكار اللاعقلانية وعلاقتها بتقبل اللقاح لدى عمال الصحة.

- Hamza Hadjer, Mohammed kheidher university of Biskra
hadjer.hamza@univ-biskra.dz

- Bouaicha Amel, Mohammed kheidher university of Biskra
amelbouaicha@gmail.com

مخبر الدراسات النفسية والاجتماعية جامعة محمد خيضر بسكرة.

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Abstract:

The current study aims to reveal the relation between the irrational thoughts and vaccine acceptance to a sample of nurses consisting of (50) nurses aged between (28-50). In order to achieve the study's objective, the researcher applied the vaccine acceptance scale prepared by; Maryam al Sanafi (2021) and the scale of irrational thoughts about health by Knadoul Nabil (2017), and used appropriate parametric statistical methods, such as modular averages and deviations, and the "t" test.

The results of the study indicated that the level of irrational thoughts was average, but the level of vaccine acceptance by healthcare workers was high. Also, the results of the study show that there is no significant correlation between vaccine acceptance and irrational thoughts among healthcare workers, and they revealed that there is no differences in irrational thoughts and vaccine acceptance based on gender and educational level.

Keywords: irrational thoughts, vaccine acceptance, healthcare workers

ملخص:

الدراسة الحالية تهدف إلى الكشف عن العلاقة بين الأفكار غير المنطقية وقبول التطعيم لدى عينة من الممرضات مكونة من (50) ممرضة تتراوح أعمارهن بين (28-50) عامًا. من أجل تحقيق هدف الدراسة، قام الباحث بتطبيق مقياس قبول التطعيم الذي أعده مريم السنفي (2021) و مقياس الأفكار غير المنطقية حول الصحة الذي أعده نabil قندول

(2017)، واستخدام أساليب إحصائية بارامترية مناسبة، مثل المتوسطات والانحرافات المعيارية، واختبار "t".

أظهرت نتائج الدراسة أن مستوى الأفكار غير المنطقية كان متوسطاً، ولكن مستوى قبول التطعيم بين العاملين في الرعاية الصحية كان مرتفعاً. كما أشارت نتائج الدراسة إلى عدم وجود علاقة ذات دلالة بين قبول التطعيم والأفكار غير المنطقية بين العاملين في الرعاية الصحية، وكشفت أيضاً أنه لا توجد فروق في الأفكار غير المنطقية وقبول التطعيم وفقاً للجنس والمستوى التعليمي.

الكلمات المفتاحية: الأفكار اللاعقلانية، تقبل اللقاح، عمال الصحة.

1. Introduction

The COVID-19 pandemic, which is caused by a respiratory severe infection, represents a worldwide crisis since December 2019. People with a history of co-morbid pathologies like hypertension, obesity, and diabetes are more likely to be affected by it to a fatal degree. In addition and due to their poor health infrastructure and training, African countries are more vulnerable to the spread of this virus (birhun G , 2022,p1736).

The first officially identified case of COVID-19 in Algeria was in February 2020. As the rates of infection became widely recorded in the country; many theories and rumors about coronavirus proliferated quickly.

A wide variety of irrational thoughts related to coronavirus and its vaccines emerged at the early stages of the pandemic. These include: “this whole coronavirus thing doesn’t actually exist, the president Tebboun is behind the spread of COVID-19 virus to stop the hirak”; “the vaccine is an American chip to track people down”; and “the United States and China got into biological war.” Such rumors and other conspiracy theories have not only nourished and reinforced irrational thoughts about the COVID-19 vaccine but also contradicted the acceptance of all vaccine types. This had led to a negative impact on believing in the effectiveness of COVID-19 vaccines and also the willingness to actually take them.

Such irrational thoughts are not only shared among normal citizens but they become even stronger among health workers too. This had a negative impact on people’s logical sense to focus on the benefits of the vaccines rather than their consequences (Zhou F, 2020, p1).

As COVID-19 vaccines developed, the Algerian government was one of the very first countries to buy them. This was done to curb the infection rate down and to protect the Algerian people from this fatal virus. Healthcare workers were prioritized, by the minister, to get vaccinated first, but many of them were confused as to whether they should take such vaccines or not.

1.1 The problem

Vaccination is considered one of the greatest achievements of the public health sector. It has contributed to the reduction of mortality rates for many diseases. However, despite this, many studies' results have shown that the vaccination rate has decreased over the years as even vaccinated people had important doubts and concerns (Dubé, 2013, p1763).

To prevent the spread of coronavirus, several initiatives have been implemented worldwide. For example: individuals were advised to wash their hands, to wear masks, and to socially and physically distance themselves, in addition to quarantines (Joanne Enticott, 2022, p2).

With the introduction of COVID-19 vaccines, Algeria was one of the countries that attempted to protect its citizens, and it made healthcare workers a priority to take the vaccine.

However, As the vaccine of COVID-19 (Sputnic V), (Novavax) ,(ASTRA-ZENECA) became available in Algeria, some healthcare workers have expressed reservations and hesitations about the vaccination. In fact, HCW is a reliable and respectable source of both information and confidence for patients on vaccines.

Previous research on vaccine acceptance showed that vaccine-related attitudes vary significantly across demographics and are associated with specific individual different profiles and their irrational ideas about it.

Irrational beliefs are defined as “unrealistic verbal reasoning processes by which external events are interpreted and through which emotional distress is mediated”(khalaf n, p47, 2012). In the Algerian context, many external factors can contribute to irrational thoughts about the vaccine and its impacts, and to its acceptance negatively among healthcare workers. These include politics, which is involved with the vaccine process, conspiracy theories from social media and the like. As the international health organization “WHO” put it: ‘In fact, we are not just fighting an epidemic; we're fighting an info emic’. Fake news spreads faster and more easily than this virus and is just as dangerous. (pedrag tevanovi, 2020).

Many researchers have conducted studies that dealt with the subject of irrational thoughts. For example, Al-Qahtani (2021)’s study revealed the high level of irrational thoughts and the existence of a significant statistical relationship between psychological stress and irrational thoughts among nurses in the hospital. The researcher's results indicated that the nurses have a high level of psychological stress, as well as a high level of irrational thoughts.

Usually, healthcare workers are the source of the reliable information about

vaccines, but in the COVID-19 vaccine case, they had a high rate of hesitancy among them which was due to a lack of knowledge about this particular vaccine. Despite that healthcare workers were usually the very first citizens that want to get and accept the vaccine, now irrational thoughts about this latter made them distrust it.

In this regard, the subject of irrational ideas has also received the attention of many studies, the first is entitled Psychological Determinants of COVID-19 Vaccine Acceptance among Healthcare Workers in Kuwait (2021): this study was conducted by Mariam Al-Sanafi and Malik Sallam. It aimed to assess the overall acceptance rates of COVID-19 vaccines in Kuwait, which was found to be among the highest (Mariam and Malik, 2021, p37).

The second study was about COVID-19 Vaccine Booster Hesitancy (2022). This study was conducted by Mohamed Lounis & Djihad Bencherit, and it aimed to determine COVID-19 vaccine booster acceptance and its associated factors in the general population in Algeria. An online questionnaire was distributed to all Algerian citizens who received COVID-19 vaccines. Overall, 787 respondents were included. Among them, 51.6%, 25%, and 23.8% accepted, rejected, or were hesitant about the COVID-19 vaccine booster respectively.

Through what was previously reviewed and to highlight the relationship between irrational thoughts and vaccine acceptance among healthcare workers, this paper answers the following research questions:

- What is the level of irrational thoughts among healthcare workers?
- What is the level of COVID-19 vaccine acceptance among healthcare workers?
- Is there a statistically significant correlation between irrational thoughts and the level of vaccine acceptance among healthcare workers?
- Are there statistically significant differences in irrational thoughts among healthcare workers attributed to gender and academic level?
- Are there statistically significant differences in vaccine acceptance among healthcare workers attributed to gender and academic level?

1.2. - Hypotheses

- The level of irrational thoughts among healthcare workers is high.
- The level of vaccine acceptance among healthcare workers is low.
- There is a statistically significant correlation between irrational ideas and the level of vaccine acceptance of healthcare workers.
- There are statistically significant differences in irrational thoughts among

healthcare workers working in the Cancer Control Center due to the variable of sex.

- There are differences in the level of vaccine acceptance among workers working in the Cancer Control Center due to the variable of sex.

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- There are statistically significant differences in the level of vaccine acceptance among workers working in the cancer Control Center due to the educational level

- There are no statistically significant differences in the level of irrational thoughts among workers working in the Cancer Control Center due to their educational level.

1.3.-Study objectives

- Identifying the level of both irrational ideas and the level of COVID-19 vaccine acceptance among healthcare workers.

- Identifying the impact of irrational ideas on the acceptance of COVID-19 vaccine.

- Identifying irrational ideas that have to do with reducing the level of vaccine acceptance.

- Providing solutions that may be appropriate to the problem of irrational thoughts and the level of vaccine acceptance based on the results of this study, and making recommendations that may be useful for healthcare workers dealing with this problem

1.4. Study concepts

1.4.1.- Irrational thoughts

Were identified by Albert Elleis as negative sets of habitual responses due to burden and illogical ideas, prejudices, and values which we have raised as negative ways of thinking. (Mutaaz bdullah, 200, p 70).

It was also defined by (Palmer and Dryden, 2002) as those misconceptions, characterized by irrationality and based on expectations, intimidations and generalizations that were not in place and considered wrong to cause individuals to experience psychological and emotional disorders that hindered their course of life. (Palmer, & Dryden, 2002)

Irrational thoughts can be defined as false and illogical ideas that lead individuals to form incorrect expectations. They are measured through the results from the scale of irrational thoughts related to health used in this study.

1.4.2.- Vaccine acceptance

Is defined by **Eve Dube** as the individual or the group's decision to accept or refuse when presented with the ability to vaccinate. (eve dupe, 2021,p176).

It was also defined as those patients who had been vaccinated, who were willing to get the vaccine or who were waiting to get the COVID-19 vaccine .(kip,2022,p 68).

COVID-19 vaccine acceptance refers to the willingness of nurses to receive and trust the available vaccines (Sputnic V), (Novavax) ,(ASTRA-ZENECA to protect themselves and others from the virus.

1.4.3.- Corona virus

The World Health Organization defined the coronavirus infectious disease as a contagious disease, caused by a sars-cov-2 virus, which was discovered in 2019 and became pandemic in 2020,it began as a respiratory acute syndrome which is characterized mainly by fever and cough and is capable of progressing to severe symptoms and in some cases death, especially in older people and those with underlying health conditions. (WHO, 2019).

COVID-19 became a global pandemic in early 2020, leading to widespread public health measures to control its spread, such as social distancing, mask-wearing, and lockdowns.

1.4.4- Healthcare workers

Healthcare worker is anyone who delivers care and services to the sake of ailing patients .(bobby joseph, 2016, p17).

A healthcare worker is one who delivers care and services to the sick and ailing either directly as doctors and nurses or indirectly as aides (joseph, 2016, p18).

Healthcare workers refer to a diverse group of individuals who are employed in various roles within the healthcare industry. They play a crucial role in promoting health.

2. - Methods

2.1.- Exploratory study

The exploratory study is an examination study that aims to collect information and data about the sample. This paper adopted the exploratory study on a sample of 30 healthcare workers from the anticancer center of Batna to test the validity and the credibility of the tests, so it gives the researcher a predictive vision about the results to the basic study.

2.2.- Methodology used

The current study seeks to investigate the problem of irrational thoughts about health and its impact on vaccine acceptance by expressing and describing it quantitatively and qualitatively. Then, it explores and reveals the relationship between this latter and the level of vaccine acceptance and the level of irrational thoughts by clarifying: the academic level, age, and gender among a sample of 50 healthcare workers in the light of COVID-19 pandemic.

2.3.- Research areas:

- Time domain: the research was conducted from October to November 2022.
- The sample: the study's sample consists of (50) male and female healthcare professionals working in the center of anticancer Batna such as: doctors, nurses, radiology physicians, laboratory technicians, anesthetists, and others).

Table 1.- Sample characteristics

Sample Characteristics	Categories	Frequency	Percentage
Gender	Female	30	40%
	Male	20	60%
Marital status	Married	45	90%
	Single	05	10%
Age	under40	32	64%
	over 40	18	36%
Educational level	Bac+3	21	42%
	Bac+7	13	26%
	Bac	16	32%
TOTAL		50	100 %

Source: made by the researcher.

2.4.-Identification of research tools

Questionnaires were distributed to healthcare professionals at anti-cancer center Batna in order to assess the level of irrational thoughts about their health and the level of vaccine acceptance through adopted scales

2.5.-The scale of covid 19 vaccine acceptance

The scale was developed by **Mariam Al-Sanafi & Malik Sallam in 2021**. The questionnaire comprised an introductory section with a consent to participate statement. This was followed by 31 mandatory items divided as follows:

A section on the socio demographic data about age and gender of the participants, their occupation (physician, dentist, pharmacist, nurse, laboratory technician, or other).

A section about history of chronic diseases such as hypertension, diabetes, or a previous COVID-19 diagnosis of the participant.

A section about the willingness to receive the vaccine on the participant's intent for COVID-19 vaccination and identifying the belief in a conspiracy about SARS-CoV-2 origin; and

A section on the preference for COVID-19 vaccine based on technology, and the preference for COVID-19 vaccine based on developer.

2.5.1.- Scale correction method

The scale consists of 10 paragraphs. “Strongly disagree” response was given a minimum score of 1, “neutral” response was given a score of 4, and the maximum score of 7 was given to “strongly agree” response. After calculating the validity of the scale, it consists of (9) statements, and we have a triple Likert scale that includes (03) alternatives (yes, I'm not sure, no), see table 2.

Table 2.- Calculation of the mean scores of the respondents for the vaccine acceptability scale.

Test 1	Test 2	Results 1
27-9	27-45	63-45
Low	Average	High

Source: made by the researcher

2.6.- The psychometric characteristics of the scale

The validity of the scale was calculated in two ways

2.6.1.-Discriminatory validity

This method is used in calculating the validity of the scale through its ability to distinguish between its two ends, and between the lower and upper groups. This method is used in calculating the formative validity and the validity of the content, where we arranged the sample scores ascending, taking 27% from both ends of the distribution ($26 * 27/100$). We calculated the difference using the "T" test between the averages of the two groups. The value of the t-test is (10.38) at the calculated significance level ($\alpha=0.000$), which is less than the significance level ($\alpha=0.05$).

2.6.2.-The internal consistency

The scale's internal consistency was verified by its application to a survey sample of 26 patients. The Pearson correlation coefficient was calculated between the scores of each paragraph of the scale variables with the total score of the axis to which it belongs, and between the total score of the axis with the total score.

The results showed that the items of the scale are statistically significant at the level of significance (0.01), while there is one item that is not statistically significant, which is paragraph 09, which will be deleted and excluded from the statistical analysis. This confirms that the items of the scale have a good degree of internal consistency, and therefore the scale is true to what was set to measure it, and it can be relied upon in the basic study.

To verify the stability of the scale, the researcher used the following methods:

2.6.3.- Cronbach's alpha coefficient

To verify the stability of the vaccine acceptability scale, the Cronbach alpha coefficient method was adopted. The value of Cronbach's alpha was (0.87), indicating that the scale has a very acceptable degree of stability. This reassures the researcher to apply it to the basic study sample.

The second way that was used to calculate the stability of the scale is using the semi-division method, where the degree of the first half was calculated, as well as the degree of the second half of the degrees, by calculating the correlation coefficient between the two halves, then the length was modified using

Guttman. With a high degree of stability, the researcher is assured of its application to the main study sample.

2.7- The scale of irrational ideas about health

The scale was developed by Kandoul Nabil (2021), the questionnaire comprised an introductory section with a consent to participate statement; this was followed by 21 items divided into 3 dimensions, each dimension containing 7 items.

-beliefs of physical weakness

This dimension contains the items 1-4-7-10-13-16-19

-beliefs of exaggerating things to the worse

This dimension contains the items 2-5-8-11-14-17-20

-beliefs of illness dilution from the environment

This dimension contains the items 3-6-9-12-15-18-21.

2.7.1.- Scale correction method

The point “never” on the scale was given a minimum value of (1), “rarely” was given a score of (2), and “sometimes” was given the value of (3), “often” was given the score of (4) the maximum score of (5) was given to “always”.

It consists of (17) statements, in addition to a five-point Likert scale that includes (05) alternatives (never, rarely, sometimes, often, always). The degrees were presented in the order (1,2,3,4,5), so that the greatest degree is 5 and the least degree is 1. The largest degree of the scale is multiplied by the number of statements, and the smallest degree of the scale is multiplied by the number of statements to get the highest and lowest degree.

Table 2.- The calculation of the mean scores of the respondents on the irrational thoughts scale

Very low	Low	Average	high	Very high
17-30	30-44	44-58	57-71	71-85

Source: made by the researcher

2.8.-The psychometric characteristics of the scale

2.8.1.- Discriminatory validity

This method is used in calculating the validity of the scale through its ability to distinguish between its two ends, and between the lower and upper groups. Also, this method is used in calculating the formative validity and the validity of the content, where we arranged the sample scores ascending, and took 27% from both ends of the distribution ($26 * 27/100$). Moreover, the difference using the "T" test between the averages of the two groups was calculated: it is evident that the value of the t-test is (9.76) at the calculated significance level ($\alpha=0.000$), which is less than the significance level ($\alpha=0.05$).

2.8.2.-Internal consistency reliability

The internal consistency reliability of the scale was verified by applying it to a sample of 26 participants. Pearson correlation coefficients were calculated between the scores of each item of the scale and the total score of the axis to which it belongs and the total score of the scale.

The results indicate that the items of the scale are statistically significant at the significance levels (0.01 and 0.05). However, there are some non-significant items, namely (16, 17, 18, 21), which will be deleted and excluded from the statistical analysis. This confirms that the items of the scale demonstrate a good level of internal consistency.

Therefore, the scale is valid for its intended measurement, and it can be relied upon in the primary study.

2.8.3.- Scale reliability

To assess the reliability of the scale, the following methods were used:

2.8.3.1.- Cronbach's Alpha

The Cronbach's Alpha coefficient was used, and the results revealed that the value of Cronbach's Alpha is 0.78, indicating that the scale possesses a very acceptable level of reliability, which assures the researcher of its applicability to the primary study sample.

2.8.3.2.- Split-Half Method

To assess the scale's reliability using the split-half method, the survey data from 26 participants was used. The first-half and second-half scores were

calculated separately, and the correlation coefficient between the two halves was computed. The scale length was then adjusted using Spearman-Brown's formula, and the results showed that the split-half reliability coefficient before adjustment was 0.72. After adjusting the scale length using Spearman-Brown's formula, the reliability coefficient became 0.84. Similarly, using Guttman's method, the reliability coefficient is 0.84 too. These results confirm that the scale possesses a high level of reliability, which ensures the researcher's confidence in its application to the basic study sample.

3.-Results and discussion

3.1.-Results related to the First hypothesis of the study

The hypothesis of the study states that the level of irrational thoughts among workers working in the Cancer Control Center is high.

To determine the level of irrational thoughts, the arithmetic average of the scores of the sample, and the theoretical average, were calculated, and then compared between the two averages using the t-test.

Hypothetical mean formula = number of items * mean variant of the scale

Hypothetical mean = $17 * 3 = 51$.

Table 3.- the level of irrational thoughts among workers working at the Cancer Control Center

The variable	Mean	Standard deviation	Difference between averages	hypothetical mean	Freedom level	T test	Statistical significance
Irrational thoughts	53,7400	4,10480	2,74000	51	49	4,720	,000

Source: made by the researcher.

Data in the table above shows that the arithmetic mean of the sample scores in irrational thoughts is (53.74), which is a value located in the arithmetic mean according to the levels specified in Table No. (*). As for the hypothetical mean, its value was (51), and the difference between the two averages was estimated at (2.74). The value of the t-test for one sample was (4.72), which is a function of the significance level (0.05) and the degree of freedom (49), and this result confirms that the level of irrational thoughts The workers is average, and therefore the first hypothesis is not verified

3.1.2.- Discussion of the First hypothesis:

The level of irrational thoughts among nurses is AVERAGE and; therefore, the hypothesis is not confirmed. This can be explained by psychological pressure and anxiety resulting from work. Irrational thoughts are characterized by illogical thinking, exaggerating issues, and having pessimistic perspectives. The essence of these thoughts lies in anxiety, overthinking, and amplifying reactions. This finding is confirmed by many studies such as Al-Qahtani (2021), which indicated that nurses experience high levels of psychological stress, which is associated with an increase in irrational thoughts.

The elevation of the level of the results of irrational thoughts among nurses can be attributed to several factors, the most important of which is the increase in their responsibilities, carrying the fear of transmission of the infection and spreading it to their families, and the challenges faced both at work and at home. The inability to balance these aspects reinforces their negative self-perception and the negative perception others and society have towards nurses. Media and social media also contribute to distorting their image, leading to the distortion and solidification of their beliefs and promoting irrational thinking.

3.2.- Results and discussion related to the second hypothesis of the study:

The hypothesis of the study states that the level of vaccine acceptance among workers working at the Cancer Control Center is high.

To determine the level of vaccine acceptability, the arithmetic mean of the scores of the sample was calculated, and the hypothetical mean, was compared between the two averages using the t-test. The results are shown in Table.

Hypothetical mean formula = number of items * mean variant of the scale

Table 4.- The level of vaccine acceptance among workers working at the Cancer Control Center

Variable	Mean	Standard deviation	Difference between averages	hypothetical mean	Freedom level	T test	Statistical significance
Vaccin Acceptance	51,4200	4,69516	19,42000	32	49	29,247	,000

Source: made by the researcher

Data in the Table above shows that the arithmetic mean of the scores of the sample in accepting the vaccine is (51.42), which is a value located in the arithmetic mean according to the levels specified in Table No(*). As for the hypothetical mean, its value was (32), and the difference between the two averages was estimated at (19,42000). The value of the t-test for one sample was (29,247), which is a function of the level of significance (0.05) and the degree of freedom (49), and this result confirms that the level of acceptability of the vaccine by the workers working in the Cancer Control Center is high, and therefore the hypothesis is **VERIFIED**.

3.2.1.- Discussion of Results related to the second hypothesis of the study

The researcher expected the results; understandably, healthcare workers were concerned about the risk of COVID-19 contamination. They are on the front lines of healthcare, directly interacting with patients who may have the virus. Their concerns can stem from the potential exposure to the virus, the risk of transmitting it to their loved ones, and the challenges of maintaining their own health while caring for others .To address these concerns and mitigate the risks, healthcare facilities and organizations implement a range of safety measures including physical distancing, and vaccination against COVID-19, which plays a crucial role in reducing the severity of the disease and preventing transmission. Healthcare workers are often in many countries among the first to receive the vaccine.

3.3.- Results related to the Third hypothesis of the study

The hypothesis of the study states that "there is a correlation between vaccine acceptance and irrational thoughts among workers working in a high cancer control center."

Table 5.-The results of the hypothesis treated with Pearson's correlation coefficient

Variable	Sample	standard deviation	Mean	correlation coefficient	probability value
Vaccine acceptance	50	4,10480	53,7400	-,013	,927
Irrational Thoughts		4,69516	51,4200		,927

Source: made by the researcher.

The table shows that the probability value $0.92 = \text{sig}$ is greater than the level of significance 0.05 , which shows that "there is no statistically significant correlation between vaccine acceptance and irrational thoughts among workers working at the Cancer Control Center." Accordingly, the hypothesis is not Verified.

3.3.1.- Discussion of the Results related to the third hypothesis of the study

The result was not expected by the researcher due to the level of vaccine acceptance average of the sample being high and the level of irrational thoughts among the sample being found average. No statistical correlation between the two variables was reported. This can be referred to the strong acceptance and embracement of the vaccine by healthcare workers and the lack of irrational thoughts about health among the sample of the study because of their high intellectual level. Their role is of paramount importance, not only in administering vaccines but also in being reliable sources of information for their patients. Equipped with accurate information about vaccines, they hold a dual responsibility of disseminating this knowledge. This approach is pivotal in fostering confidence in the vaccines.

To ensure healthcare workers are well-prepared, it is imperative to provide them with regular updates on vaccine research and safety data. By addressing their apprehensions, we can nurture their confidence, which in turn can be channeled into effective communication with patients and the broader public, thereby motivating more individuals to embrace vaccination.

3.4.- Results related to the fourth hypothesis of the study

The hypothesis of the study states that there are differences in the level of irrational thoughts among workers working in the Cancer Control Center due to the gender variable.

To achieve the results of the hypothesis, we applied the t-test for two independent samples, and the results were as follows:

Table 4.-Table of application of the test for two independent samples

	Sex	number	MEAN	Standard Deviation	T test	statistical significance
Irrationnal thoughts	Male	20	54,6500\$	4,29535	1,289	,640
	Female	30	53,1333	3,92809		
	TOTAL	50				

Source: made by the researcher

Based on Table: it was found that the value of T is equal to 1.28 at the level of significance (0.64), and this is greater than the level of significance (0.05), which indicates that there are no differences in the level of irrational thoughts among workers working in the Cancer Control Center based on the variable of sex, and therefore the hypothesis of the study is not verified, compared to the arithmetic mean.

3.4.1.-Discussion discussion related to the fourth hypothesis of the study

Comparing males and females, no differences in the level of irrational thoughts among workers working in the Cancer Control Center were found. This could be due to similarities between the two genders in terms of work conditions, tasks, working hours, financial incentives, and their critical role in managing the pandemic, which results in the same high level of stress. This latter is the essence of their irrational thoughts, illogical exaggeration and pessimistic outlook. these results are consistent with several studies such as Belasla (2020) and Akakba (2022).

The relation of irrational thoughts with COVID-19 anxiety among students revealed that there are no statistically significant differences between males and females regarding irrational thoughts.

3.5.- Results related to the fifth hypothesis of the study

The hypothesis of the study states that there are differences in the level of vaccine acceptance among workers working in the Cancer Control Center due to the gender variable.

To achieve the results of the hypothesis, we applied the t-test for two independent samples, and the results were as follows:

Table 5.-Table of application of the test for two independent samples

Variable	Sex	Number	MEAN	Standard Deviation	T test	statistical significance
Vaccine acceptance	Male	20	51,3000	4,85690	-,146	,845
	Female	30	51,5000	4,66646	-,146	
	TOTAL	50				

Source: made by the researcher

Based on Table. it was found that the T value is equal to 0.14 at the level of significance (0.84), and this is greater than the level of significance (0.05). This indicates that there are no differences in the level of vaccine acceptance among workers working in the Cancer Control Center based on the sex variable, and therefore, the hypothesis of the study is not verified, compared to the arithmetic mean.

3.5.1.-Discussion of the Results related to the Fifth hypothesis of the study

The results reflect the orientation of the researcher because it was noticed that healthcare workers, both males and females, enthusiastically embraced vaccination, recognizing the benefits of protecting themselves, their families, and their patients from severe illness.

In the initial stages of the pandemic, there were shortages of personal protective equipment like masks, and gloves. This shortage heightened concerns among healthcare workers about their safety and embrace of the vaccine.

It is known that some healthcare workers expressed hesitancy or resistance to getting vaccinated for various reasons, but this was not the case for the present sample as it showed a High vaccine acceptance.

3.6.-results related to the sixth hypothesis of the study:

The hypothesis of the study states that there are no statistically significant differences in the level of irrational thoughts among workers working in the Cancer Control Center due to their educational level. To verify the results of the hypothesis, we applied the one-way ANOVA test, and the results were as follows

Table 6.- ANOVA application table

Soure of Variance	squares	Freedom level	mean squares	F value	P value
Between Groups	32.714	2	16.357	0.97	0.87
Within groups	792.906	47	22.944		
Total	825.620	49			

Source: made by the researcher

It is clear based on the table, which represents the results of the differences using the F test for one-way ANOVA analysis of variance, that there are no statistically significant differences in the level of irrational thoughts among workers working in the Cancer Control Center due to the educational level, where the mean squares between groups amounted to (16.35) and within groups amounted to (16.87). This value is considered non-significant as the probability value reached (.38), which is greater than the level of significance (0.05), between the degrees of freedom (2 and 2). 47). According to these results, the hypothesis is verified.

3.6.1.-Discussion related to the sixth hypothesis of the study

The results state that there are no statistically significant differences in the level of irrational thoughts among workers working in the Cancer Control Center due to their educational level. This can be explained by the similarity of working circumstances and the amount of pressure at work to transmit the infection to their families. In addition to the stigma that follows them, the

change of their lifestyle, and the fact that they suffer from poor working conditions in different ways.

This result was expected by the researcher and is consistent with the study of Ayman Al-Zamali (2018). The existence of these irrational thoughts among nurses affects not only their productivity at work but also, according to Kopikirana (2012), it diminishes work motivation, task achievement, proper job performance, and leads to failure in carrying out assigned tasks and responsibilities at work. This was also confirmed by a study conducted by Roschebly et al. (2008), stating that individuals holding irrational beliefs are unable to think productively and logically in problem-solving, and negative thoughts obstruct their personal skills towards accomplishment.

3.7.- Results related to the seventh hypothesis of the study

The hypothesis of the study states that there are statistically significant differences in the level of vaccine acceptance among workers working in the cancer Control Center due to the educational level, and to verify the results of the hypothesis, we applied the one-way ANOVA test, and the results were as follows:

Table 7.- ANOVA application table

Soure of Variance	Squares	Freedom level	mean squares	F value	P value
Between Groups	1.830	2	.915	0.04	0.96
Within groups	1078.35	47	22.944		
Total	1080.180	49			

Source: made by the researcher

It is clear based on the table that represents the results of the differences using the F test for one-way analysis of variance ANOVA, that there are no statistically significant differences in the level of vaccine acceptance among workers working in the Cancer Control Center based on the variable of their educational level. It is noted that the mean squares between groups reached (0.91) and within groups reached (22.94). This value is considered non-

significant as the probability value reached (0.96), which is greater than the level of significance (0.05), between the two degrees of freedom (2 and 47). Hence the hypothesis is not verified.

3.7.1.-Discussion related to the seventh hypothesis of the study

We notice that Vaccine acceptance among healthcare workers including doctors, nurses, or nurse assistants was a notably equal concern.

Healthcare workers, being on the frontline of the pandemic, were among the first groups to have access to COVID-19 vaccines (Sputnic V), (Novavax), (ASTRA-ZENECA). However, despite their educational level they expressed a high level of vaccine acceptance. Similarly, a previous study by Mohamed Lounis (2022) about COVID-19 vaccine acceptance in Algeria, showed that healthcare workers were more likely to accept this vaccine, unlike non-health workers despite their educational level or profession.

This is related to the importance of the vaccine for healthcare workers. Their vaccination is not only crucial for their personal protection, and for their families, but also for maintaining the continuity of healthcare services and safeguarding vulnerable patients. It is important to mention that healthcare workers faced discrimination and stigmatization due to their increased exposure to the virus. This added to their stress and anxiety and their need to accept vaccination to stay protected.

4. Conclusion

In conclusion, in our study the variables were analyzed to determine accurate outcomes. The results of the study indicated that the level of irrational thoughts was average, but the level of vaccine acceptance by healthcare workers was high. Also, the results of the study show that there is no significant correlation between vaccine acceptance and irrational thoughts among healthcare workers, and they revealed that there is no differences in irrational thoughts and vaccine acceptance based on gender and educational level.

it can be said that healthcare workers are more susceptible to developing irrational thoughts. Therefore, the researcher recommends providing therapeutic programs to educate nurses on how to cope with psychological pressures, develop positive thinking, and enhance emotional regulation. Additionally, it's recommended to focus on creating awareness and preventive days aimed at enriching logical and rational thinking among this segment of society. Moreover, implementing therapeutic programs based on rational emotional theory within

hospitals for the benefit of staff can help them overcome irrational thoughts they might have.

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