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Original article

Awareness and satisfaction of the national hepatitis C virus screening campaign among a sample of the general population in Egypt.

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ABSTRACT

Background: The researchers conducted the current study to explore knowledge and satisfaction with the Hepatitis C Healthy Lives Initiative among a sample of Egyptians. **Methods:** An exploratory cross-sectional study was carried out among 1,193 clients attending HCV screening sites via consecutive sampling technique. A structured interview questionnaire was used, including three sections: sociodemographic characteristics, satisfaction with the hepatitis C screening program, and HCV-related knowledge. **Results:** Approximately half of the enrolled participants showed good HCV knowledge. Males had a higher percentage (51.0%) of good knowledge scores (p = 0.029). Individuals with a university degree scored higher (65.9%) than those with other levels of education. More than half of the participants (701, 58.8%) reported high satisfaction with the screening campaign, with patients with no comorbidities showing more satisfaction ($p < 0.05$). Participants were motivated to be screened to check their health status (94.9%) and were encouraged mostly by family members (65.9%). Regression analysis revealed that higher education level, employment, having no comorbidity, not living in slums, and having no negative family history of HCV were significant factors in predicting a high level of knowledge. **Conclusion:** The current study revealed that half of the enrolled participants showed good HCV knowledge. The majority of the study participants were satisfied with the screening campaign. The media played a crucial role in raising awareness of the campaign to eliminate HCV, and it is necessary to consider introducing HCV education via mass media.

Introduction

Hepatitis C virus (HCV) infection is a global public health burden, affecting over 70 million people with chronic infection [1]. According to the government's most recent Egypt Health Issues Survey (EHIS) results in 2015, the national prevalence rate for the hepatitis C virus among individuals aged 1–59 years is 4.4%. The prevalence is significantly higher among adults over 40, people with low incomes, and those living in rural areas [2].

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HCV costs Egypt more than $400 million annually, and total spending is projected to reach $4 billion by 2030 [3].

The United Nations General Assembly adopted the Sustainable Development Goals in 2015, which included combating viral hepatitis [3] . In May 2016, the World Health Assembly set targets for viral hepatitis eradication, including 90% diagnosis, 80% treatment coverage, and a 65% reduction in related mortality by 2030 . The Egyptian government has successfully controlled HCV as a public health threat, with a high potential to eliminate this disease by 2030 [4].

Starting in October 2018, the Egyptian Ministry of Health and Population (MoHP) launched the 100 Million Healthy Lives Initiative (The National HCV and Non-communicable Disease (NCD) Screening and Testing Campaign) [5]. All adult Egyptian citizens were targeted for screening. This campaign succeeded in screening more than 48 million citizens. The MoHP applied core testing principles during this national mass testing, including voluntary consent, confidentiality, counseling, correct test results, and connection (linkage to prevention, treatment, and care and support services), to maximize both individual and public health benefits while ensuring client satisfaction [5].

Egypt would be closer to HCV elimination when cost-effective strategies are directed not only towards creating awareness, perceived risk, or motivation to change (at an acceptable level) but also towards motivating the adoption of risk-reduction behaviors for HCV, tackling misconceptions, and reinforcing social support. Additionally, patients' understanding of hepatitis C could influence the uptake of hepatitis C screening, treatment adherence, and treatment outcomes, thereby reducing the chances of effective elimination campaigns. Increased involvement in screening campaigns is revealed by previous studies for numerous diseases, including cervical cancer [6], hepatitis B [7], and HIV [8].

Client satisfaction is multidetermined and includes diverse aspects of care, such as accessibility of services, quality of medical care, clarity of HCV knowledge, healthcare needs, and the patient satisfaction style of the health provider [9]. Studies repeatedly show that patients who feel more actively involved in their healthcare decision-making process are more committed to their care, adhere better to positive health behaviors, and are more satisfied with their healthcare. Consequently, the current study explored knowledge and perception about HCV and satisfaction with the Hepatitis C Healthy Lives Initiative among a sample of Egyptians.

Methods

Study design and setting

The study is an exploratory cross-sectional study carried out among clients attending HCV screening sites in different rural and urban areas to assess hepatitis C-related knowledge and their satisfaction with the 100 Million Healthy Lives Initiative (The National HCV and NCDs Screening and Testing Campaign) and different factors affecting their satisfaction among a sample of the general population. We conducted the study in the waiting room of the selected HCV screening sites from October 2018 to May 2019.

Sample size and sampling technique

The researchers used a consecutive convenience sampling technique to recruit participants who attended the 100 Million Healthy Lives Initiative (The National HCV and NCDs Screening and Testing Campaign) during the study duration. Our sampling technique was justified at the time of the study. Although convenience sampling is not the best method, it is commonly used in biological research and is always conducted in a dynamic population [10,11]. We chose different days of the week randomly to prevent selection bias. All participants aged 18 or older who agreed to participate were included in the study. The number of participants involved in this study was 1,193.

Data collection tool

A pre-tested two-page structured interview questionnaire was used to collect data from the study participants. It included three sections:

Section I: Sociodemographic characteristics: age, residence, marital status, education, occupation, comorbidity, and family history of HCV.

Section II: Knowledge of study participants regarding HCV, composed of 12 items addressing modes of transmission, symptoms and complications (6 questions), and prevention (6 questions). The questions were formatted as close-ended with yes, no, and do not know options. The questions were coded so that true answers were scored 1, while wrong answers or answers with "I do not know" were scored 0. The total raw score (if all

answers were correct) was 12. The percent score was calculated by dividing the raw score by 12 (the maximum achievable score) and multiplying the result by 100. We adopted questions used in this section from the literature [12-14]. Sources of knowledge about HCV included family, friends, radio and television, health care providers, partners, the internet, and others, including newspapers and mass campaigns. We considered participants with 75% as knowledgeable, which was a modification of Bloom's cutoff point [15].

Section III: Thirteen questions about satisfaction with the Hepatitis C screening program. We scored each item using a five-point Likert scale that ranged from very good = 4, good, fair, weak, and did not take part = 0. We defined overall satisfaction as the average score of the 13 measured satisfaction questions.

The original language of the included items was English; they were translated to Arabic by experts, followed by back-translation to English by other independent experts. Survey completion took approximately 15 minutes.

The questionnaire was based on face validity by a panel of five experts in public health, and the required modifications were made. Content validity was statistically tested by Cronbach's alpha. Initially, the data collection form was composed of 14 knowledge items with a reliability coefficient of 0.466 (Cronbach's alpha); after removing 2 items, reliability was tested using internal consistency, and a Cronbach's alpha of 0.777 was found for the 12 knowledge questions. We performed a pilot study to test the clarity of the questions by interviewing 15 participants (not included in the study). Based on the findings, specific changes were made to the questions to remove ambiguity and make them easier to understand and comprehend.

Statistical analysis

The researchers performed the statistical analysis using the Statistical Package for the Social Science Program (SPSS, version 21). We summarized the data using the mean, standard deviation, and range for quantitative variables and frequency and percentage for qualitative variables. Comparisons between groups were performed using the chi-square and Mann–Whitney tests for quantitative data comparison. Items on the five-point Likert scale for satisfaction areas were recorded as follows: very good = 2, good = 1, fair = 0, weak = -1. The maximum attainable score was divided by the sum of scores for all items to calculate the score. Analysis of variance using the Mann–Whitney U test and Kruskal–Wallis test was carried out to examine the differences in the mean satisfaction scores within sociodemographic variables. *p*-values of less than 0.05 were considered statistically significant. Multiple regression analysis was conducted, with the overall mean knowledge score being the dependent variable and the sociodemographic characteristics being the independent variables.

Ethical approval

We obtained approval for the study protocol from the Ethical Committee at the Ministry of Health and Population. Administrative approval was acquired from the Health Research Unit (Ministry of Health and Population) and the management of the district healthcare team. The confidentiality of data, safe data storage, and privacy rights have always been respected. Only those who agreed were included in the study. All procedures for data collection were treated according to the Helsinki Declaration of Biomedical Ethics.

Consent to participate: Informed consent was obtained directly from the study participants before data collection and after explaining the study objectives and importance.

Results

The total number of participants enrolled in the study was 1,193, with a mean age of 49.5 ± 14.6 years and a range of 18–96 years. More than half of the participants were female (55%). Forty percent of participants were uneducated. More than half of the participants (52.7%) lived in rural areas, and 47.1% were employed. Most of the participants (84.3%) were married. Comorbidity was reported by 40% of the participants; 27.2% had hypertension (HTN), while 23.8% had diabetes mellitus (DM). Most participants (75.9%) reported a good or very good perception of their own health, with 36.1% having a positive family history of HCV infection; most were siblings. Participants were motivated to be screened to check their health status (94.9%) and were primarily encouraged by family members (65.9%). All participants learned about the campaign from the media (untabulated results).

As presented in **table (1)**, approximately half of the study participants (47.5%) had a good knowledge score about HCV. Most participants had a high percentage of correct answers to questions related to the transmission of HCV infection but

lower scores for questions related to the long-term effects of HCV and the presence of vaccination. More than 80% had correct answers regarding transmission by blood transfusion, vertical transmission from mother to child, tooth brushing, and handling sharp objects such as razors and blades during cupping therapy. In contrast, 22% to 35% had misconceptions about HCV transmission, believing it cannot be transmitted by shaking hands, kissing, and working with an infected person and can be transmitted by having sex with an infected partner. Nearly half of the participants (58.3%) knew that people infected with hepatitis C could be asymptomatic and appear healthy, while only 32.9% knew that infection could be complicated by cirrhosis or HCC. More than three-quarters (77%) had misconceptions about the presence of an HCV vaccine. The highest percentage (48.1%) of participants obtained their knowledge about HCV infection from the media, and 9.5% from healthcare workers (HCWs) **(Figure 1)**.

Table 2 illustrates the relationship between participants' knowledge scores about HCV and the studied variables. It is apparent from the table that males had a higher percentage (51.0%) of good knowledge scores than females (44.7%), with a statistically significant difference (p = 0.029). Individuals with a university degree scored higher (65.9%) than those with other levels of education. The scores of single and married participants were comparable to each other and higher than those of participants with other marital statuses (p = 0.009). Working participants, those living in rural or urban areas, those with no comorbidity or family history of HCV, and those with very good health perceptions had a higher percentage of good knowledge scores.

As presented in table **(3)**, more than 60% of participants gave an excellent or very good score for easy access to the campaign site. The majority (80.0%) gave an excellent or very good score for all items in the survey, such as cleanliness, the work system, the waiting period before meeting the responsible employee, and the easy registration process. In contrast, 54.1% gave an excellent or very good score, and 31.0% expressed very bad for sufficient information about hospital transfer when needed.

More than half of the participants (701, 58.8%) reported high satisfaction with the screening campaign, as presented in Table 4. It is apparent from Table 4 that participants with no comorbidities had a higher percentage (62.8%) of high satisfaction levels than participants with comorbidities (52.6%), with a statistically significant difference ($p < 0.001$).

Regression analysis revealed that higher education level, employment, having no comorbidity, not living in slums, and having a negative family history of HCV were significant factors in predicting a high level of knowledge, as displayed in **table (5)**.

Table 1. HCV knowledge-related questions and total knowledge score (n = 1193).

Questions	No. (%)[$]
1- Do you think that the hepatitis C virus can be transmitted by getting a blood transfusion from an infected donor?	973 (81.6)
2- Do you think that the hepatitis C virus can be transmitted by shaking hands with a person who has the hepatitis C virus? [a]	928 (77.8)
3- Do you think that the hepatitis C virus can be transmitted by kissing a person who has the hepatitis C virus? [a]	898 (75.3)
4- Do you think that the hepatitis C virus can be transmitted by having sex with a person who has the hepatitis C virus?	770 (64.5)
5- Do you think that the hepatitis C virus can be transmitted through childbirth to a woman with viral hepatitis during childbirth?	986 (82.6)
6- Do you think that the hepatitis C virus can be transmitted by using the toothbrush of an infected person?	1011 (84.7)
7- Do you think that the hepatitis C virus can be transmitted by handling or touching a needle or sharp object that contains blood infected with the hepatitis C virus, for example, razors, blades, or during cupping therapy?	1027 (86.1)
8- Do you think that the hepatitis C virus can be transmitted by working with a person who has the hepatitis C virus? [a]	841 (70.5)
9- Do you think that if a person has hepatitis C virus, he is likely to carry the virus throughout his life?	279 (23.4)
10- Do you think infection with the hepatitis C virus can cause cirrhosis/cancer?	392 (32.9)
11-Can you believe that a person with hepatitis C virus (HCV) can live well?	696 (58.3)
12-Do you think that there is a vaccination against the hepatitis C virus? [a]	274 (23)
#Overall knowledge score	
Good	567(47.5)
Poor	626(52.5)

#Participants with 75% as knowledgeable (good knowledge), which was a modification of Bloom's cutoff point.
'a' refers to the false answer being the correct answer.
$ No. (%) indicates the right answers.

Table 2. Relationship between knowledge level about HCV infection, sociodemographic characteristics and medical history and health perception of participants (n = 1193).

Variables	Knowledge level		*p* value
	Good (n = 567) n(%)	Poor (n = 626) n(%)	
Age (years)Mean ± SD	49.5 ± 14.9	49.5 ± 14.4	0.982
Gender			
Male	274(51.0)	263(49.0)	0.029*
Female	293(44.7)	363(55.3)	
Educational level			
Not educated	225(47.7)	247(52.3)	
Basic	146(43.8)	187(56.2)	0.003*
Secondary or technical	138(46)	162(54)	
University or high	58(65.9)	30(34.1)	
Marital Status			
Not Married	78(41.7)	109(58.3)	0.083
Married	489(48.6)	517(51.4)	
Working status			
Working	293(52.1)	269(47.9)	0.003*
Not working	274(43.4)	357(56.6)	
Residence			
Urban	217(53.1)	192(46.9)	
Rural	341(54.2)	288(45.8)	<0.001*
Slums	9(5.8)	146(94.2)	
Comorbidity			
Yes	148(31)	329(69)	<0.001*
No	419(58.5)	297(41.5)	
Diabetes Mellitus			
Yes	85(29.9)	199(70.1)	<0.001*
No	482(53)	427(47)	
HTN			
Yes	98(30.2)	226(69.8)	<0.001*
No	469(54)	400(46)	
IHD			
Yes	1(11.1)	8(88.9)	0.040*
No	566(47.8)	618(52.2)	
Hepatic			
Yes	1(2.2)	44(97.8)	<0.001*
No	566(49.3)	582(50.7)	
Renal			
Yes	1(3.8)	25(96.2)	<0.001*
No	566(48.5)	601(51.5)	
Own health perception			
Bad	3(18.8)	13(81.3)	
Intermediate	42(19.1)	178(80.9)	
Good	254(52.8)	227(47.2)	<0.001*
Very good	260(61.2)	165(38.8)	
Excellent	8(15.7)	43(84.3)	
Family history of HCV			
Yes	164(38.1)	267(61.9)	<0.001*
No	403(52.9)	359(47.1)	

#SD: standard deviation, HTN: hypertension, IHD: ischemic heart disease, HCV: hepatitis C virus.
* $p \leq 0.05$ is statistically significant.

Table 3. Percentage of participants' satisfaction regarding the HCV screening campaign.

Items	Very unsatisfied	Unsatisfied	Acceptable	Satisfied	Extremely satisfied
1- Easy access to the place	13(1.1)	59(4.9)	354(29.7)	509(42.7)	258(21.6)
2- Cleanliness and work system in the place	6(0.5)	5(0.4)	251(21)	714(59.8)	217(18.2)
3- The waiting period before meeting the responsible employee	9(0.8)	9(0.8)	211(17.7)	699(58.6)	265(22.2)
4- Easy registration process	8(0.7)	6(0.5)	199(16.7)	625(52.4)	355(29.8)
5- The general appearance of the workers	8(0.7)	9(0.8)	150(12.6)	610(51.1)	416(34.9)
6- Attention of doctors and staff and their good care	7(0.6)	7(0.6)	142(11.9)	629(52.7)	408(34.2)
7- Have your questions been met with sufficient attention and an appropriate answer obtained?	8(0.7)	12(1)	173(14.5)	627(52.6)	373(31.3)
8- Respecting the privacy of participants	15(1.3)	12(1)	146(12.2)	608(51)	412(34.5)
9- Waiting time for results	7(0.6)	9(0.8)	164(13.7)	642(53.8)	371(31.1)
10- Were the results explained to you, and your questions answered?	8(0.7)	16(1.3)	155(13)	614(51.5)	400(33.5)
11- How confident are you in the results	10(0.8)	12(1)	117(9.8)	631(52.9)	423(35.5)
12- Did you get enough information about transferring to another hospital when needed?	367(30.8)	19(1.6)	166(13.9)	421(35.3)	220(18.4)
13- Your overall evaluation	8(0.7)	8(0.7)	83(7)	401(33.6)	693(58.1)

Table 4. Relationship between satisfaction level about HCV screening campaign, sociodemographic characteristics, medical history, and health perception of participants

Variables	Satisfaction level		
	High (n = 701) n(%)	Low (n = 492) n(%)	*p*-value
Age (years)			0.166
Mean ± SD	49 ± 14.9	50.2 ± 14.1	
Gender			0.949
Male	315(58.7)	222(41.3)	
Female	386(58.8)	270(41.2)	
Educational level			0.248
Not educated	262(55.5)	210(44.5)	
Basic	199(59.8)	134(40.2)	
Secondary or technical	183(61.0)	117(39.0)	
University or high	57(64.8)	31(35.2)	
Marital Status			
Not Married	116(62.0)	71(38.0)	0.322
Married	585(58.2)	421(41.8)	
Work status			
Working	331(58.9)	231(41.1)	0.928
Not working	370(58.6)	261(41.4)	
Residence			
Urban	251(61.4)	158(38.6)	0.36
Rural	364(57.9)	265(42.1)	
Slums	86(55.5)	69(44.5)	
Comorbidity			
Yes	251(52.6)	226(47.4)	<0.001*
No	450(62.8)	266(37.2)	
Diabetes Mellitus			
Yes	151(53.2)	133(46.8)	0.028*
No	550(60.5)	359(39.5)	
Own health perception			
Bad	8(50.0)	8(50.0)	
Intermediate	139(63.2)	81(36.8)	
Good	283(58.8)	198(41.2)	0.359
Very good	238(56.0)	187(44.0)	
Excellent	33(64.7)	18(35.3)	
Family history of HCV			
Yes	252(58.5)	179(41.5)	0.878
No	449(58.9)	313(41.1)	

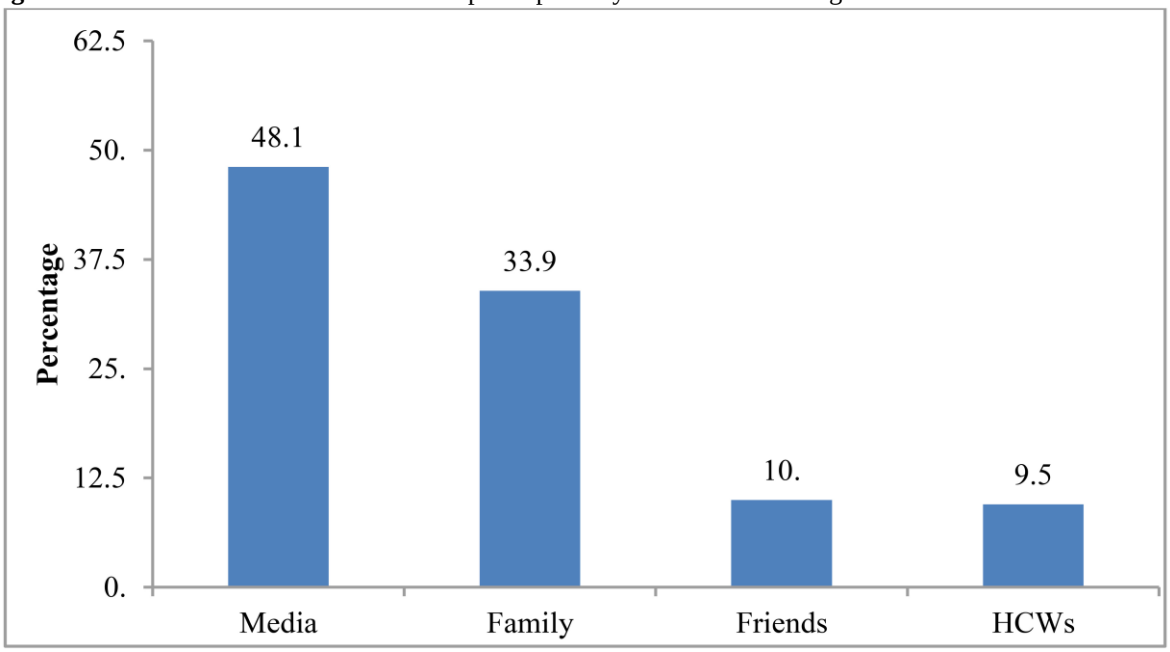
SD: standard deviation, *$p \leq 0.05$ is statistically significant.

Table 5. Multivariate analysis to predict high-level knowledge.

	B(SE)	*p* value	OR(95% CI)
Educational level			
Not educated			Reference
Basic	-0.31(0.17)	0.065	0.73(0.53-1.02)
Secondary or technical	-0.37(0.18)	0.044	0.69(0.48-0.99)
University or high	0.89(0.31)	0.004	2.45(1.33-4.50)
Work	0.32(0.14)	0.018	1.38(1.06-1.80)
Comorbidity	-0.65(0.15)	<0.001	1.92(1.46-2.55)
Residence			
Slums			Reference
Urban	2.38(0.38)	<0.001	10.80(5.17-22.59)
Rural	2.61(0.37)	<0.001	13.55(6.51-28.22)
Family history of HCV	-0.33(0.14)	0.021	1.39(1.05-1.83)
Constant	-2.86(0.79)	<0.001	

B=Regression coefficients, SE=Standard error of the coefficient, OR=Odds Ratio, 95% CI = 95% confidence interval. A P value ≤0.05 is statistically significant.

Figure1. Percent distribution of the enrolled participants by source of knowledge.



Discussion

Our results demonstrated that approximately half of the enrolled participants showed good HCV knowledge. Participants were motivated to be screened to check their health status and were encouraged mostly by family members. More than half of the participants (701, 58.8%) reported high satisfaction with the screening campaign, with patients without comorbidities showing more satisfaction.

The knowledge level in the current study aligns with findings from a study conducted among the general population in Korea, where, despite South Korea's high educational level, the degree of knowledge and testing for HCV was relatively low. However, the findings of this study contradict those of **Shalaby et al.** [13] who reported that participants' levels of knowledge were relatively high, with over 80% positive responses to most questions. This discrepancy might be explained by the fact that **Shalaby et al**. [13] did not distinguish between participants' knowledge of HBV and HCV infection. Additionally, it is crucial to consider the diversity of the tested populations and the endemicity of HCV in different regions. The current and Korean studies

involved general populations in regions with varying levels of HCV awareness and education.

In contrast, **Shalaby et al.** [13] may have studied a population with different demographics or a higher prevalence of HCV, which could contribute to higher knowledge levels. The endemicity of HCV in the regions studied could significantly shape public awareness and understanding of the disease. These factors should be considered when comparing the results of different studies.

The well-known modes of transmission reported in the current study were blood transfusion, vertical transmission from mother to child, tooth brushing, and handling sharp objects. This is consistent with previous studies [16], which demonstrated that more than 80% of participants knew these modes well. On the other hand, **Chemaitelly et al.** [14] reported that a higher percentage (94%) were unaware of mother-to-child transmission. The findings of this study contradict that of **Sultan et al.** [17], who indicated that most Egyptian HCV-infected patients lacked an adequate understanding of the routes of HCV transmission. This discrepancy could be related to defects in previous campaigns that did not address disease progression due to the paucity of treatment options in the past.

The current study found misconceptions about regular physical contact, such as shaking hands and working in the same place as infected people, as transmission routes (22% and almost 30%, respectively). This aligns with **Chemaitelly et al.** [14], who stated that 14% believed HCV could spread through casual physical contact. Another misconception was that 35.5% of participants did not know that sexual contact could transmit the virus; this finding was slightly higher than what was reported by **Shalaby and his colleagues** [13] (25%). This could be explained by the fact that participants were mainly from rural and slum areas (66%) and had a low level of education or were uneducated (67.5%). As previously noted, the EDHS report in 2008 mentioned that infection was more frequent in rural than urban areas (12% vs. 7%) due to a lack of awareness and unhealthy practices and was higher in illiterate people (14.5%) than in those who had completed secondary education or higher (4.1%) [13]. This finding highlights the need for awareness campaigns targeting the less educated and those residing in rural areas.

Our study demonstrated that nearly half of the participants (58.3%) knew that people infected with hepatitis C could be asymptomatic and appear healthy, which aligns with the known fact that hepatitis C progression may take more than 15 years before symptoms appear [12,15]. However, only 32.9% knew that infection could be complicated by cirrhosis or HCC. This finding could be related to successful health awareness campaigns, which focused mainly on raising awareness of methods of viral transmission due to the paucity of treatment options in the past. These results necessitate updated health messages focusing on disease progression and complications to enhance effective infection avoidance.

In terms of vaccination, more than three-quarters of the study participants wrongly believed that a vaccine for hepatitis C prevention was available. False knowledge of the presence of HCV vaccination was higher in our study (77%) than reported by **Ashri** [15], who found that knowledge of the presence of vaccination was 22.5. This difference might be explained by the different study groups in both studies, where our study targeted the general population, including both educated and uneducated individuals.

Most participants (70-80%) had good knowledge about the sources of transmission and the lifelong effects of the virus (complications). This finding might be due to the outstanding educational message about transmission to prevent infection, primarily in the absence of effective medication. Moreover, future messages should include awareness of the complications if not treated. The media was the main source of information; therefore, messages should be propagated through it.

Most participants (80%) had good to excellent health perceptions, a positive point for the campaign to get healthy people involved in screening. Our study showed that the highest percentage (48.1%) of participants had obtained their knowledge from the media, in line with **Chemaitelly et al.** (2013), and 9.5% from healthcare workers (HCWs), which is a low percentage compared to that reported by **Shalaby et al.** [13] (30% of doctors).

We found a positive relationship between higher education and HCV knowledge score, consistent with a recent study by **Sultan et al.** [17]. However, males had statistically higher knowledge scores than females, contrasting with a study by

Mah et al. (18). The different target populations might explain this difference, as Mah and colleagues targeted hepatitis C patients.

Participants were motivated to be screened to check their health status and were primarily encouraged by family members. This percentage was lower than that reported by a recent study conducted in Egypt. This finding aligns with **Metwally et al., (4)** who stated that HCV infections clustered within families, with children being at increased risk if their parents were infected and spouses being at higher risk if their partner was infected [4]. Our study revealed that participants with a positive family history, especially siblings and parents, represented almost half of the sample; sharing the same housing conditions made them more attentive to checking their health.

Satisfaction was high for all items, demonstrating the campaign's attention to the environment and human resources. This was consistent with a study conducted among administrative workers at Ain Shams University, where 91% of participants were satisfied with the services provided by the national hepatitis C screening campaign [18]. However, a drawback was the lack of information when someone needed to be transferred to another hospital. The trauma of being positive and needing further assessment requires reassurance and a direct, clear pathway.

Conclusion

The current study revealed that half of the enrolled participants showed good HCV knowledge. The majority of study participants were satisfied with the screening campaign. The media played a crucial role in raising awareness of the campaign. To eliminate HCV, publicity and education about HCV are needed, and it is necessary to consider introducing HCV education via mass media. Egypt would be closer to adopting risk-reduction behaviors for HCV, raising awareness, and tackling misconceptions among the general population.

Study limitations

The results cannot reveal causal relationships because the current study is cross-sectional. However, the present study was conducted to explore the current situation in a new area of inquiry and generate plausible hypotheses because there was no information regarding satisfaction.

Disclosure of potential conflicts of interest

The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

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Authors' contributions

I. A. contributed substantially to the study conceptualization and design, data analysis and interpretation, and manuscript writing. I. A. and M.A contributed substantially to data acquisition and manuscript writing. E. D., M. M., and M. R. were involved in drafting the manuscript (methods and results sections) and revising it carefully for important intellectual content and statistical analysis. All authors read and approved the final version of the manuscript.

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References

1- **Estes C, Abdel-Kareem M, Abdel-Razek W, Abdel-Sameea E, Abuzeid M, Gomaa A, et al.** Economic burden of hepatitis C in Egypt: the future impact of highly effective therapies. Alimentary pharmacology & therapeutics. 2015;42(6):696-706.

2- **Kandeel A, Genedy M, El-Refai S, Funk AL, Fontanet A, Talaat M.** The prevalence of hepatitis C virus infection in Egypt 2015: implications for future policy on prevention and treatment. Liver international : official journal of the International Association for the Study of the Liver. 2017;37(1):45-53.

3- **El-Sayed M, Manal M.** The new national strategy on viral hepatitis. Al-Ahram Sci Club. 2014

4- **Metwally AM, Elmosalami DM, Elhariri H, El Etreby LA, Aboulghate A, et al.** Accelerating Hepatitis C virus elimination in Egypt by 2030: A national survey of communication for behavioral development as

a modelling study. PloS one. 2021;16(2):e0242257-e0242257.

5- **Waked I, Esmat G, Elsharkawy A, El-Serafy M, Abdel-Razek W, Ghalab R, et al.** Screening and Treatment Program to Eliminate Hepatitis C in Egypt. New England Journal of Medicine. 2020/03/19 2020;382(12):1166-1174.

6- **Kurt G, Akyuz A**. Evaluating the Effectiveness of Interventions on Increasing Participation in Cervical Cancer Screening. The journal of nursing research : JNR. 2019;27(5):e40-e40.

7- **van der Veen YJ, Voeten HA, de Zwart O, Richardus JH.** Awareness, knowledge and self-reported test rates regarding Hepatitis B in Turkish-Dutch: a survey. BMC public health. 2010;10:512-512.

8- **Evangeli M, Pady K, Wroe AL.** Which Psychological Factors are Related to HIV Testing? A Quantitative Systematic Review of Global Studies. AIDS and behavior. 2016;20(4):880-918.

9- **Doss W, Shiha G, Hassany M, Soliman R, Fouad R, Khairy M, et al.** Sofosbuvir plus ribavirin for treating Egyptian patients with hepatitis C genotype 4. Journal of Hepatology. 2015/09 2015;63(3):581-585.

10- **Cochran WG**. Sampling Techniques. John Wiley & Sons, Inc.; 1963.

11- **Fowler J, Floyd J.** Survey Research Methods. 2nd ed ed. vol Vol. 1. Sage Publications; 1993.

12- **El-Zanaty F, Way A.** Knowledge and prevalence of hepatitis C. Egypt demographic and health survey. 2008;2009

13- **Shalaby S, Kabbash IA, El Saleet G, Mansour N, Omar A, El Nawawy A**. Hepatitis B and C viral infection: prevalence, knowledge, attitude and practice among barbers and clients in Gharbia governorate, Egypt. Eastern Mediterranean Health Journal. 2010/01/01 2010;16(01):10-17.

14- **Chemaitelly H, Abu-Raddad LJ, Miller FD**. An apparent lack of epidemiologic association between hepatitis C virus knowledge and the prevalence of hepatitis C infection in a national survey in Egypt. PloS one. 2013;8(7):e69803-e69803.

15- **Ashri NY.** Hepatitis B and C knowledge among Saudi dental patients. Saudi med j. 2008;29(12):1785-90.

16- **Fraley SS, Altmaier EM.** Correlates of patient satisfaction among menopausal women. Journal of Clinical Psychology in Medical Settings. 2002;9:235-243.

17- **Sultan NY, YacoobMayet A, Alaqeel SA, Al-Omar HA.** Assessing the level of knowledge and available sources of information about hepatitis C infection among HCV-infected Egyptians. BMC public health. 2018;18(1):747-747.

18- **Mah, Allison & Hull, Mark & DeBeck, Kora & Milloy, Michael & Dobrer, Sabina & Nosova, Ekaterina & Wood, Evan & Kerr, Thomas & Hayashi, Kanna.** (2017). Knowledge of hepatitis C and treatment willingness amongst people who inject drugs in an era of direct acting antivirals. International Journal of Drug Policy.2021.47. 10.1016/j.drugpo.2017.02.006.

19- **Abd-ElSamad NB, Basyoni NI, Allam MF, El-Damaty SI.** Participation and Satisfaction with the National Campaign on Viral Hepatitis C and Non-Communicable Diseases among Administrative Workers of Ain Shams University, Cairo, Egypt. QJM: An International Journal of Medicine. 2021/10/01 2021;114(Supplement_1).