

Knowledge, Attitudes and Practices of the Population of the Republic of Moldova Regarding Viral Hepatitis C

Valentin CALUGAREANU^{1*}, Angela PARASCHIV¹, Diana SPATARU¹

Abstract

Introduction. Viral hepatitis C (VHC) remains a major public health concern in the Republic of Moldova, which records one of the highest prevalence rates in Europe. Understanding the knowledge, attitudes, and practices (KAP) of the population is a prerequisite for designing effective prevention and control strategies.

Aim. To assess KAP related to VHC in a mixed cohort from the Republic of Moldova and to identify factors associated with KAP scores.

Material and Methods. Cross-sectional descriptive study (2024-2025), with 567 participants: 455 healthcare workers and 112 members of the general population. A purpose-built KAP scale (0-30 points) assessed knowledge (0-10), attitudes (0-10), and practices (0-10). Statistical analysis included Mann-Whitney U and Kruskal-Wallis tests, and Spearman's correlation.

Results. The mean KAP score was 17.82 ± 3.81 points (59.4%), with 63.7% of participants at a moderate level. Healthcare workers scored significantly higher than the general population (18.85 vs 13.62, $p < 0.001$). A positive correlation was found between knowledge and practices ($\rho = 0.336$, $p < 0.001$).

Conclusions. Most participants showed a moderate KAP level, with relatively favorable attitudes, while knowledge and practices remained insufficient. Targeted educational programs are needed, particularly for the general population, those with lower education, and residents of rural areas.

Keywords: viral hepatitis C, prevention and control strategies, knowledge, attitudes, and practices (KAP)

¹Nicolae Testemitanu State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

***Corresponding author:**

Valentin CALUGAREANU, Nicolae Testemitanu State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

E-mail: valentin.calugareanu@gmail.com

INTRODUCTION

Hepatitis C virus (HCV) remains a significant global public health concern. In 2022, it was responsible for an estimated 242,000 deaths worldwide. Approximately 50 million people are living with HCV infection, and approximately 1.5 million new infections occur annually, and the infection remains a leading driver of chronic liver disease, cirrhosis, and hepatocellular carcinoma^{1,2,22}. Despite the availability of highly effective curative treatment, diagnosis and treatment coverage remain insufficient: only 36% of infected individuals have been diagnosed, and about 20% have received treatment¹. In the Republic of Moldova, the situation is particularly worrying: the prevalence of HCV infection has been estimated at 3.1%, placing the country among those with the highest burden in the European region^{3,4}.

Over the last two decades, the National Agency for Public Health of the Republic of Moldova has implemented efforts to reduce the burden of HCV through national programs targeting the morbidity and mortality associated with viral hepatitis, including HCV^{3,5,6,7}. Two consecutive national initiatives (2012–2016 and 2017–2021) contributed to a reduction in HCV incidence by adopting a comprehensive approach, which included the expansion of diagnostic capacities and the implementation of public awareness campaigns^{5,6,7}. Despite these improvements, available evidence indicates that the prevalence of chronic HCV infection and rates of liver cirrhosis in Moldova remain among the highest in Eastern Europe^{8,9,10}.

Transmission of HCV occurs predominantly through percutaneous exposure to contaminated blood—most commonly via the sharing of injecting equipment, inadequately sterilized medical instruments, tattooing or body-piercing performed under unsafe conditions, and, to a lesser extent, through unprotected sexual contact and mother-to-child transmission¹¹. A distinctive and clinically significant feature of HCV infection is its largely asymptomatic course during the early, acute phase. This silent progression frequently delays diagnosis and allows the infection to advance undetected toward fibrosis, cirrhosis, and, ultimately, end-stage liver disease. In this context, population-level awareness and the adoption of protective behaviors become indispensable tools for controlling the epidemic.

Healthcare workers constitute a group with heightened occupational risk. Accidental percutaneous injuries and mucocutaneous exposure to blood and body

fluids are well-documented hazards, and non-adherence to standard precautions remains a concern in many healthcare settings^{12,13}. Ensuring that medical personnel are familiar with post-exposure protocols and consistently apply infection prevention measures is therefore a distinct priority within any national hepatitis control strategy¹⁴.

Knowledge, Attitudes and Practices (KAP) surveys have proven to be a valuable methodological instrument in public health research. By simultaneously capturing what people know, how they perceive a health issue, and what behaviors they actually engage in, KAP studies generate actionable evidence for policy-makers and program designers^{14,15,21}. Such surveys have been conducted for hepatitis C in various countries, but data from the Republic of Moldova remain scarce, creating a gap in the regional evidence base. The present study was designed to address precisely this gap.

AIM

The primary aim of this study was to evaluate the level of knowledge, attitudes and practices (KAP) regarding viral hepatitis C among the population of the Republic of Moldova, and to identify sociodemographic factors associated with KAP scores, with a view to informing the design of targeted educational interventions.

MATERIAL AND METHODS

Study design and setting

An observational, cross-sectional, descriptive study was carried out between January 2024 and February 2025. The study was conducted across four localities in the Republic of Moldova: Chişinău, Bălţi, Străşeni, and Briceni, representing different levels of urbanisation and geographic distribution.

Study population and sampling

The sample comprised 567 adult participants (aged 18–75 years), recruited by random sampling from the participating localities. Of these, 455 (80.2%) were healthcare workers (physicians, nurses, and auxiliary medical staff) and 112 (19.8%) were members of the general population (teachers, economists, farmers, retirees, and unemployed individuals). The geographic distribution was as follows: Bălţi (n = 242; 42.7%), Străşeni (n = 109; 19.2%), Chişinău (n = 96; 16.9%), and Briceni (n = 87, 15.3%).

Inclusion criteria: age 18-75 years, written informed consent, and ability to complete the questionnaire in Romanian.

Exclusion criteria: refusal to participate and incomplete questionnaires.

Data collection instrument

A structured questionnaire was developed in EpiInfo and adapted to the local epidemiological context; it was subsequently administered in paper format, with participants completing it in person at the respective data collection sites. It covered five thematic domains: (1) sociodemographic data (sex, age, education, occupation, marital status, income, and place of residence); (2) knowledge about HCV transmission routes, risk factors, clinical manifestations, and prevention; (3) attitudes toward the disease and the perceived need for information; (4) practices related to HCV testing, vaccination, and risk behaviours; and (5) for healthcare workers only, questions regarding standard precautions specific to the occupational setting.

KAP scale development

A purpose-built quantitative KAP scale (0-30 points) was developed with three equal components:

Knowledge score (0-10 points): correct answers on HCV transmission routes (2 points), risk factors (4 points), and self-assessed level of information (0-4 points depending on the response).

Attitudes score (0-10 points): favorable attitudes towards seeking information (2 points), adherence to dietary recommendations (2 points), recognition of alcohol and tobacco as aggravating factors (2 points each), and intention to seek medical care (2 points).

Practices score (0-10 points): previous HCV testing (3 points), vaccination in accordance with the national immunization calendar (2 points), and – for healthcare workers – safe practices including avoidance of needle recapping (2 points), glove changing after each patient (2 points), and knowledge of post-exposure management (1 point).

The total KAP score was classified into three levels: low (< 50%; 0-14 points), moderate (50-75%; 15-22 points), and high (> 75%; 23-30 points).

Statistical analysis

Data were processed using Python 3.12. Continuous variables are presented as mean \pm standard deviation (SD) or median, as appropriate. Categorical variables are expressed as absolute and relative frequencies. For between-group comparisons, the Mann-Whitney U test (two groups) and the Kruskal-Wallis test (three

or more groups) were used, given the non-normal distribution of data. Correlations were assessed with Spearman's rank correlation coefficient (ρ). The threshold for statistical significance was set at $p < 0.05$.

Ethical considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki. All participants provided written informed consent prior to data collection. Data confidentiality was ensured through full anonymization of questionnaire responses.

Some questionnaires required clarification during completion, particularly among participants from the general population.

RESULTS AND DISCUSSIONS

Sociodemographic characteristics

The study enrolled 567 participants with a mean age of 45.1 ± 13.2 years (range: 18-75). Women constituted 86.6% ($n = 491$) of the sample, a distribution largely explained by the female-dominated composition of the healthcare workforce, which accounted for 80.2% of respondents. Regarding educational attainment, 44.8% ($n = 254$) had completed a college or vocational program, 34.6% ($n = 196$) held a university degree, 11.3% ($n = 64$) had specialized secondary education, and 9.7% ($n = 55$) had primary, trade, or no formal education. Most participants were married (77.2%, $n = 438$) and had children (87.3%, $n = 495$); among parents, 84.8% ($n = 481$) reported having vaccinated their children according to the national immunization schedule.

The occupational breakdown comprised 151 physicians (26.6%), 280 nurses (49.4%), 24 auxiliary healthcare staff (4.2%), and 112 members of the general population (19.8%), encompassing teachers, economists, agricultural workers, retirees, and unemployed individuals.

Knowledge about hepatitis C

When asked to self-assess their own level of knowledge regarding hepatitis C, 55.0% ($n = 312$) of respondents reported being 'well informed' and a further 27.9% ($n = 158$) as 'very well informed'. In contrast, 15.7% ($n = 89$) indicated that they were 'not particularly informed' while 1.4% ($n = 8$) reported being 'not informed at all'. Despite this relatively high level of self-reported knowledge, 82.9% ($n = 470$) expressed a desire to receive additional information on hepatitis, indicating awareness of existing knowledge gaps. The topics rated as most important for further learning were treatment options for hepatitis, cirrhosis, and hepatocellular

carcinoma (57.7%, $n = 327$), followed by risk factors (46.9%, $n = 266$), clinical signs (45.5%, $n = 258$), preventive measures (44.6%, $n = 253$), and vaccination (43.7%, $n = 248$).

Regarding routes of transmission, blood-borne exposure was correctly identified by 81.0% ($n = 459$) of participants. However, notable misconceptions were also identified: 54.5% ($n = 309$) incorrectly considered sexual intercourse with multiple partners, even when condoms are used, to be a significant route of HCV transmission. Knowledge of risk factors was generally more accurate, with 94.0% ($n = 533$) correctly recognizing blood transfusion as a risk factor. In contrast, only 38.1% ($n = 216$) correctly indicated that condom use reduces the risk of sexual transmission, highlighting gaps in understanding of preventive measures.

The mean knowledge score was 5.05 ± 1.40 out of a maximum of 10 points (50.5%). Notably, 99.6% ($n = 565$) of participants were classified as having low knowledge levels ($< 50\%$). These findings are considerably lower than those reported in comparable European studies, where knowledge levels typically range between 55% and 70%¹⁵, highlighting a substantial gap in hepatitis C - related literacy within the Moldovan population.

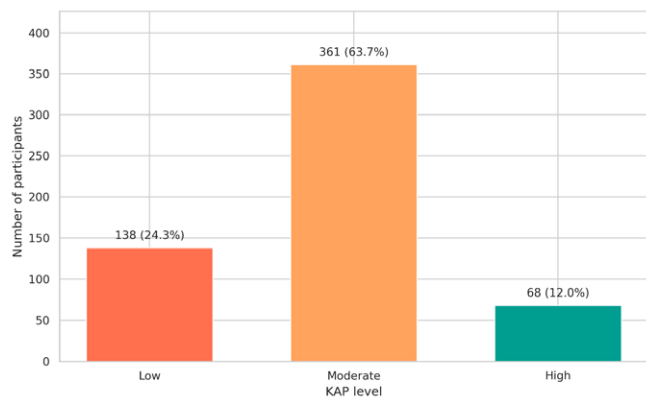


Figure 1. Illustrates the distribution of knowledge scores across the study sample

Attitudes toward hepatitis C

Overall, attitudes toward hepatitis were markedly positive. Nearly all participants (98.4%, $n = 558$) agreed that the general population should be better informed about hepatitis and its consequences. Awareness of lifestyle-related aggravating factors was similarly high: 95.4% ($n = 541$) acknowledged that alcohol consumption worsens the course of the disease, and 85.2% ($n = 483$) recognized tobacco use as an additional aggravating factor. Furthermore, 95.2% ($n = 540$) also agreed

that patients diagnosed with hepatitis B or C should follow specific dietary recommendations.

The self-reported health-seeking behavior was generally appropriate. The majority of participants 95.8% ($n = 543$) indicated that they would consult a general practitioner if they suspected hepatitis, while 4.1% ($n = 23$) would seek care directly at a hospital. Only 0.2% ($n = 1$) reported that they would manage the condition independently at home. Furthermore, 90.7% ($n = 514$) of respondents expressed their intention to seek medical attention in the presence of right upper quadrant pain.

The mean attitudes score was 7.25 ± 1.30 points out of 10 (72.5%). According to the predefined cut-offs, 63.3% ($n = 359$) of participants demonstrated favorable attitudes ($> 75\%$), 27.7% ($n = 157$) had moderate attitudes (50-75%), and 8.8% ($n = 50$) exhibited unfavorable attitudes ($< 50\%$). These results are broadly consistent with findings from other developing-country contexts¹⁶, suggesting that general public messaging about the severity of hepatitis C does reach the population, even when more specific knowledge remains limited.

Practices regarding hepatitis C

Regarding HCV testing, 77.8% ($n = 441$) of participants reported having been tested at least once, while 19.2% ($n = 109$) had never undergone testing, and 3.0% ($n = 17$) were unsure of their testing status. The prevalence of confirmed HCV infection in the study sample was 3.7% ($n = 21$), closely corresponding to national estimates. Among respondents with children, 84.8% ($n = 481$) reported adherence to the national immunization schedule, reflecting a relatively satisfactory vaccination coverage.

Physicians were the primary source of health information (76.5%, $n = 434$), followed by printed materials such as brochures and posters (41.1%, $n = 233$), television (38.4%, $n = 218$), internet search engines (26.1%, $n = 148$), and social media (26.1%, $n = 148$). The predominance of the physician as the main information source highlights the central role of healthcare professionals in delivering health education.

Among healthcare workers ($n = 455$), several concerning practices were identified. Needle recapping, a well-established risk behavior for accidental sharps injuries, was reported by 13.8% ($n = 63$) of healthcare workers, while 86.2% ($n = 392$) stated they did not practice it. Only 41.8% ($n = 190$) reported changing gloves after each patient, a proportion that falls considerably

short of standard precaution requirements. A history of at least one needlestick or sharps injury was reported by 16.5% (n = 75), and only 42.6% (n = 194) were familiar with the recommended post-exposure management protocol.

The mean practices score was 6.51 ± 2.81 points out of 10 (55.1%). The distribution by level revealed that 64.0% (n = 363) had inadequate practices (< 50%), 28.6% (n = 162) adequate practices (> 75%), and 3.4% (n = 19) moderate practices. These results point to a pronounced discrepancy between stated positive attitudes and actual behavioral compliance, a phenomenon consistent with the attitude-behavior gap described in health psychology literature^{17,18}.

Total KAP score and associated factors

The mean overall KAP score was 17.82 ± 3.81 points out of 30 (59.4%). Overall, 24.3% (n = 138) of participants were classified as having low KAP levels, 63.7% (n = 361) moderate levels, and 12.0% (n = 68) high levels. The attitude component yielded the highest sub-score (72.5%), followed by practices (55.1%) and knowledge (50.5%). This pattern, positive attitudes coexisting with deficient knowledge and inconsistent practices, aligns with findings reported in similar regional studies²⁰.

Comparisons between healthcare workers and the general population are summarized in Table 1. Healthcare workers achieved significantly higher scores for knowledge (5.38 ± 1.05 vs. 3.72 ± 1.60 , $p < 0.001$), practices (6.20 ± 2.59 vs. 2.72 ± 1.75 , $p < 0.001$), and total KAP score (18.85 ± 3.21 vs. 13.62 ± 3.10 , $p < 0.001$). Attitude scores were comparable between the two groups (7.27 ± 1.23 vs. 7.17 ± 1.55 , $p = 0.872$), suggesting that basic awareness of the disease’s seriousness is relatively uniform across the population, irrespective of professional background.

Table 1. Comparison of KAP scores between healthcare workers and the general population

KAP Component	Healthcare workers (n=455) Mean ± SD	General population (n=112) Mean ± SD	p value
Knowledge (0-10)	5.38 ± 1.05	3.72 ± 1.60	< 0.001
Attitudes (0-10)	7.27 ± 1.23	7.17 ± 1.55	0.872
Practices (0-10)	6.20 ± 2.59	2.72 ± 1.75	< 0.001
Total KAP (0-30)	18.85 ± 3.21	13.62 ± 3.10	< 0.001

Mann-Whitney U test; SD – standard deviation

Figure 2 depicts the distribution of total KAP scores by occupational group.

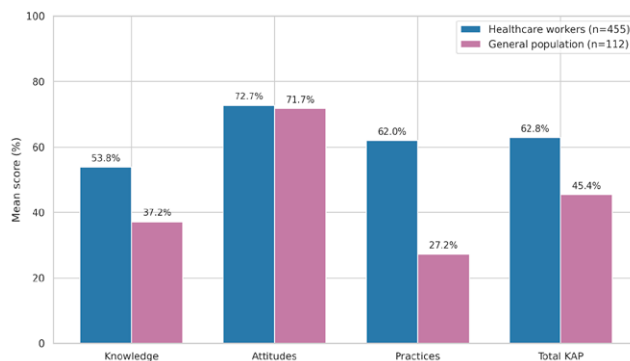
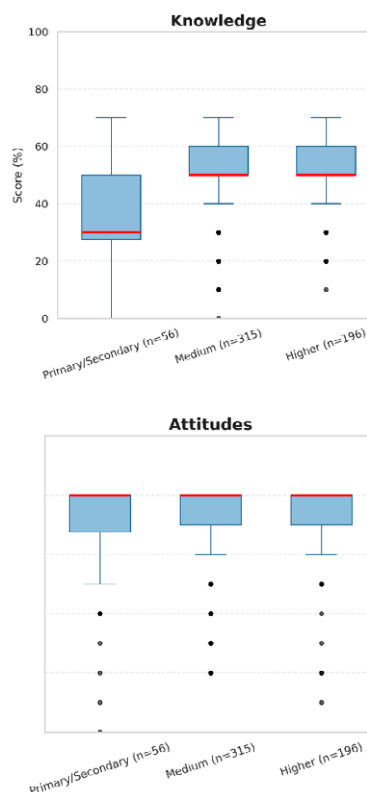


Figure 2. Comparison of total KAP scores between healthcare workers (n = 455) and the general population (n = 112).

The level of formal education emerged as a significant predictor of KAP performance. Participants with a university degree obtained the highest mean total KAP score (18.69 ± 3.59), followed by those with secondary education (18.07 ± 3.46), and those with primary or vocational schooling (13.32 ± 3.40), with statistically significant differences across groups ($H = 80.21$, $p < 0.001$). This gradient is consistent with the broader evidence base linking health literacy to educational attainment¹⁸.

Figure 3 illustrates the association between educational level and KAP scores.



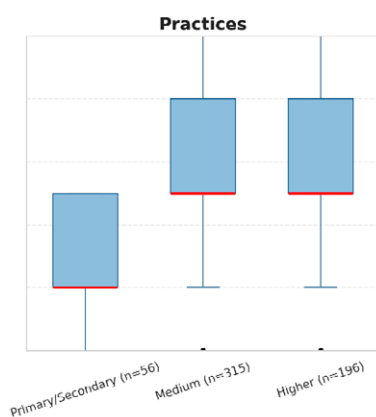


Figure 3. KAP scores stratified by educational level.

Place of residence was also associated with meaningful differences: urban dwellers scored higher than their rural counterparts on knowledge (5.35 vs. 4.62, $p < 0.001$) and total KAP (18.22 vs. 17.22, $p = 0.034$), though attitudes did not differ significantly between the two groups ($p = 0.251$). These disparities likely reflect the unequal distribution of healthcare services and access to health information in the country.

Age was not significantly associated with knowledge scores ($H = 2.19$, $p = 0.335$), but did influence total KAP scores ($H = 8.19$, $p = 0.017$). Participants aged 51–65-year achieved the highest mean KAP score (18.42 ± 3.92), compared with those aged 18–35 years (17.45 ± 3.47) and 36–50 (17.87 ± 3.76) age groups.

Correlation analysis revealed a moderate positive association between knowledge and practices ($\rho = 0.336$, $p < 0.001$), indicating that higher knowledge levels tend to translate into safer behaviors. By contrast, neither knowledge nor practices were significantly correlated with attitudes (knowledge-attitudes: $\rho = -0.041$, $p = 0.327$; attitudes-practices: $\rho = -0.075$, $p = 0.075$), which confirms that a positive disposition toward the disease does not automatically translate into protective behavior.

DISCUSSION

Overall, the results of this study paint a nuanced picture of hepatitis C literacy in the Republic of Moldova. Attitudes are comparatively strong across the population, but specific knowledge and consistent safe practices lag considerably behind. These findings suggest the presence of a knowledge-practice gap sitting beneath a

superficially favorable attitudinal landscape – has direct and practically important consequences for how public health interventions should be framed.

The phenomenon of positive intentions failing to produce corresponding behaviour change is well established in health psychology, this discrepancy has been described in behavioral research, where intentions do not always translate into actual practices¹⁹. Educational campaigns that limit themselves to conveying factual information or to reinforcing positive intentions are unlikely to be sufficient. What is needed, instead, are interventions that build concrete skills, reduce structural barriers, and create environments that support protective behavior.

Of particular concern are the unsafe practices documented among healthcare workers. The recapping of needles and the failure to change gloves between patients are well-recognized risk factors for healthcare-associated HCV transmission, and their persistence in a sample that, by definition, has received professional training is troubling. Comparable findings have been reported across the Eastern European region²⁰, suggesting that deficiencies in infection prevention and control compliance extend well beyond the Republic of Moldova. Structured retraining, supervisory feedback, and the visible enforcement of institutional infection control policies are all measures that should be considered as part of a comprehensive response.

Several limitations of the study warrant acknowledgement. The cross-sectional design precludes causal inference. The sampling strategy, while employing random selection within each locality, cannot fully guarantee representativeness at the national level given the overrepresentation of healthcare workers and the concentration in specific urban settings. Furthermore, self-reported data are inherently susceptible to social desirability bias, which may have led to an overestimation of positive practices. Finally, although the KAP scale was constructed on validated principles, its psychometric properties have not been formally tested in the Moldovan context, which may affect the comparability of results across studies.

CONCLUSIONS

The majority of the study population (63.7%) demonstrated a moderate KAP level regarding viral hepatitis C, with a mean total score of 59.4% of the maximum possible.

Attitudes subscale yielded the best results (72.5%), while knowledge (50.5%) and practices (55.1%) remained below satisfactory thresholds, indicating a meaningful discrepancy between declared intentions and actual behaviors.

Healthcare workers possessed significantly higher knowledge and reported safer practices than the general population ($p < 0.001$), yet deficiencies in the implementation of standard precautions persisted, maintaining a risk of nosocomial transmission.

Higher educational attainment and urban residence were independently associated with higher KAP scores ($p < 0.05$), underscoring the need for targeted interventions addressed to population groups with limited formal education and limited access to health services.

The positive correlation between knowledge and practices ($\rho = 0.336$, $p < 0.001$) suggests that improving knowledge may contribute to safer behaviors, supporting the role of education as a key intervention strategy.

The findings of this study support the need for targeted health education programs, particularly in identified risk groups, with particular attention to the general population with low educational attainment, rural residents, and ongoing training for healthcare workers in standard precautions and post-exposure management.

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Ethics Statement and Conflict of Interest

Disclosures

Financial support and sponsorship: All authors have declared that no financial support was received from any organization for the submitted work.

Ethics Consideration: The authors declare that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national laws. Written informed consent was provided by all the patients participants in this study. This study was approved by the Institutional Research Board and Ethics Committee.

Conflict of interest: No known conflict of interest correlated with this publication.

Availability of data and materials: The data used and/or analyzed throughout this study are available from the corresponding authors upon reasonable request.

Competing interests: The authors declared that they have no competing interests.

The use of generative AI and AI-assisted

technologies: The authors did not use in this article generative AI and AI-assisted technologies.

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