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MedEst|2026 | Vol.6: e540| ISSN: 2789-7567 |RNPS: 2524| BRIEF COMMUNICATION

Attitude, knowledge and use of information technologies in nursing students

Actitud, conocimiento y uso de las tecnologías de la información en estudiantes de Enfermería

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RESUMEN

Introducción: El perfeccionamiento del sistema educativo cubano exige renovar los procesos de enseñanza-aprendizaje en la educación superior, aprovechando las actitudes favorables de las nuevas generaciones hacia las tecnologías de la información y las comunicaciones (TIC)**. Objetivo:** Valorar la actitud de los estudiantes del cuarto año de la carrera de Licenciatura en Enfermería ante el uso de las TIC en la Universidad de Ciencias Médicas de Matanzas. **Métodos:** Se realizó un estudio observacional, descriptivo y transversal, de enero a mayo de 2025. El universo fue de 40 estudiantes (100 % de la matrícula del cuarto año). Se aplicó un cuestionario tipo Likert de 31 ítems que evaluó tres dimensiones: actitud, conocimiento y uso de las TIC. Se empleó estadística descriptiva (frecuencias absolutas y relativas). **Resultados:** La muestra estuvo compuesta por 32 mujeres (80,0 %) y 8 hombres (20,0 %), con una media de edad de 21,2 años. El 75,0 % de los estudiantes presentó un nivel alto de conocimiento sobre las TIC, el 70,0 % mostró un nivel alto de uso, y el 57,5 % declaró una actitud excelente hacia su empleo en el proceso docente. Solo el 7,5 % mostró una actitud mala. **Conclusiones:** Los estudiantes de cuarto año de Enfermería poseen una actitud predominantemente excelente hacia las TIC, con altos niveles de conocimiento y uso, lo que constituye una fortaleza para su incorporación en el proceso enseñanza-aprendizaje

ABSTRACT

Introduction: Improving the Cuban education system requires renewing teaching and learning processes in higher education, taking advantage of the positive attitudes of new generations toward information and communication technologies (ICTs).**Objective:** To assess the attitudes of fourth-year nursing students toward the use of ICTs at the University of Medical Sciences of Matanzas. **Methods:** An observational, descriptive, and cross-sectional study was conducted from January to May 2025. The study population consisted of 40 students (100% of the fourth-year enrollment). A 31-item Likert-type questionnaire was administered, evaluating three dimensions: attitude, knowledge, and use of ICTs. Descriptive statistics (absolute and relative frequencies) were used. **Results:** The sample comprised 32 women (80.0%) and 8 men (20.0%), with a mean age of 21.2 years. 75.0% of the students demonstrated a high level of knowledge about ICT, 70.0% showed a high level of use, and 57.5% reported an excellent attitude toward its use in the teaching process. Only 7.5% showed a poor attitude. **Conclusions:** Fourth-year nursing students have a predominantly excellent attitude toward ICT, with high levels of knowledge and use, which constitutes a strength for its incorporation into the teaching-learning process.

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INTRODUCTION

Substance abuse is one of the fastest-growing public health problems worldwide, encompassing legal drugs (alcohol and tobacco), over-the-counter drugs, illegal or controlled substances, as well as plants with psychoactive properties.[1,2] In developing countries, economic constraints favor the use of low-cost substances, including readily available hallucinogenic plants.[3]

Mass poisoning is defined as a toxic event related to recent exposure to potentially toxic doses of a substance, resulting in five or more people suffering acute intoxication in the same location and from the same causative agent; depending on the magnitude and type of substance, it can generate a chemical emergency. [4]

According to the World Health Organization, half a million people die annually from consuming poisonous plants, with children being the most affected. The consumption of toxic plants accounts for 1-2% of all acute poisonings worldwide, with accidental oral ingestion predominating in men. [5,6]

Datura stramonium is an annual plant of the Solanaceae family, with cylindrical stems up to 1 m tall, alternate petiolate leaves with an oval outline, and inflorescences with white, pale yellow, or violet flowers (Figure 1). [5,6] Its toxic effects are due to anticholinergic tropane alkaloids (atropine, hyoscyamine, anisodamine, and scopolamine), with the highest concentration in the seeds (0.1 mg or 3-6 mg of atropine per 50-100 seeds). [7] The anticholinergic syndrome it produces includes: hot, dry, and flushed skin; bilateral mydriasis; tachycardia and arrhythmias; decreased mucous secretions; constipation, paralytic ileus, and urinary retention; as well as agitation, disorientation, hallucinations, delirium, seizures, and coma. [5,6,7]

Acute poisoning by D. stramonium is common in people who consume it for its hallucinogenic properties, particularly in contexts of substance abuse. [5,6] In Angola, this plant has a wide geographical distribution, which facilitates its availability for recreational use. [7,8] Mass poisoning events with plants are infrequent from a toxicological point of view; however, in 2021, two events were recorded in Angola (Luanda and Malanje provinces) with high mortality, which justifies their characterization to guide prevention strategies.

The objective of this research was to characterize the patients affected by mass poisoning resulting from the consumption of Datura stramonium for the purpose of abuse.

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METHODS

The study was designed following the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) statement for cross-sectional observational studies [10].

Design and context

An observational, descriptive, cross-sectional study was conducted at the Dr. Juan Guiteras Gener Faculty of Medical Sciences of Matanzas and the University Branch of Colón, both belonging to the University of Medical Sciences of Matanzas, during the period from January to May 2025.

Population and sample

The universe consisted of all students enrolled in the fourth year of the Nursing degree program, regular daytime course, at both university sites. The sample was census-type (n=40), representing 100% of the target population, since it was a finite and fully accessible universe.

The following eligibility criteria were established:

- **Inclusion criteria:** Students regularly enrolled in the fourth year of the degree program, who attended classes during the study period and who agreed to participate voluntarily by signing informed consent.
- **Exclusion criteria:** Students with prolonged medical leave (more than 30 days) or special permits during the application of the instrument that prevented their participation at the time of data collection.
- **Elimination criteria:** Questionnaires with more than 20% of items unanswered or with inconsistent responses, defined as a uniform pattern across the entire scale (all items with the same score), suggesting lack of commitment to the survey.

Variables

Sociodemographic variables and main variables (attitude, knowledge, and use of ICT) were studied.

Sociodemographic variables:

- **Age**: continuous quantitative (years completed).

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- **Sex**: nominal qualitative (female, male).
- **University site:** nominal qualitative (Faculty of Medical Sciences of Matanzas / University Branch of Colón).

Main variables (questionnaire dimensions):

- **Level of knowledge about ICT – ordinal qualitative:** low, medium, high.
- **Level of use of ICT – ordinal qualitative:** low, medium, high.
- **Attitude toward ICT – ordinal qualitative:** poor, acceptable, excellent.

All main variables were measured using a 31-item Likert-type questionnaire, previously validated (content validity index = 0.92; Cronbach's α = 0.87). Sociodemographic variables were collected using additional items at the beginning of the instrument.

Instrument

A 31-item Likert-type questionnaire with five response options was applied: never (1), sometimes (2), frequently (3), almost always (4), and always (5). The instrument was designed ad hoc for this study, structured into three dimensions: attitude (10 items), knowledge (11 items), and use (10 items), based on the specialized literature on digital competencies in higher education [6, 11].

Content validity was evaluated through the judgment of five experts (three medical education methodologists and two educational technology specialists), who assessed the coherence, relevance, and sufficiency of each item with respect to the established theoretical dimensions. The content validity index was calculated using the proportion of experts who considered each item as relevant, obtaining an overall index of 0.92, a value considered excellent according to methodological criteria [12].

The reliability of the instrument was evaluated using Cronbach's alpha coefficient, obtaining a value of α = 0.87, which indicates adequate internal consistency [12].

Procedure

Data collection was carried out through a self-administered survey in the classroom, with a maximum duration of 20 minutes. Previously, the researchers explained the objectives of the study, guaranteed the

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confidentiality of the information, and obtained signed informed consent from each participant. No incentives were offered for participation.

To minimize social desirability bias, it was emphasized that there were no correct or incorrect answers and that the data would be used only for scientific purposes. The questionnaires were applied during class hours, in a controlled environment, and in the absence of the subject's main teacher.

Statistical analysis

A descriptive statistical analysis was performed. Ordinal qualitative variables were summarized using absolute (n) and relative (%) frequencies. Since the design was descriptive census, no statistical inference tests were applied for population parameter estimation. However, measures of central tendency (mean and median) and dispersion (standard deviation and interquartile range) were calculated for the scores obtained in each dimension, in order to characterize the data distribution. Data processing and analysis were performed using SPSS statistical software version 25.0 (IBM Corp., Armonk, NY, USA).

Ethical aspects

The study was approved by the Research Ethics Committee of the University of Medical Sciences of Matanzas (Opinion No. 12/2025, dated January 10, 2025). The ethical principles established in the Declaration of Helsinki and national regulations for research in human beings were followed.

All participants signed informed consent, after a detailed explanation of the objectives, procedures, risks, and benefits of the study. The right to confidentiality was guaranteed by anonymizing the data, assigning numerical codes to each questionnaire. The information collected was used exclusively for scientific purposes and stored on password-protected digital media, accessible only to the principal investigators.

RESULTS

Of the total number of students surveyed (n=40), a predominance of the female sex was observed, representing four out of five participants. The mean age was 21.2 years, with a range of 20 to 25

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years. Regarding distribution by site, most students belonged to the Faculty of Medical Sciences of Matanzas, while just under one third were studying at the University Branch of Colón.

Table 1. Sociodemographic distribution of 4th year Nursing students (n=40)

Variable	Category	n	%
Sex	Female	32	80,0
	Male	8	20,0
Age (years completed)	Mean (SD) = 21,2 (1,4)		
	Range = 20 – 25		
University site	Matanzas	28	70,0
	Colón	12	30,0

Source: Applied questionnaire.

Regarding the level of knowledge, all students reached at least the medium category, with no participants in the low level. 75% of the students showed a high level of knowledge. Regarding the use of ICT, although 70% reached a high level, a small group (5%) reported a low level of use, despite having medium or high knowledge. The remaining students were distributed in the medium level for both knowledge and use. (Table 2)

Table 2. Comparison between knowledge and use of ICT

Dimension	Low	Medium	High
	n (%)	n (%)	n (%)
Cognitive	0 (0,0)	10 (25,0)	30 (75,0)
Procedural	2 (5,0)	10 (25,0)	28 (70,0)

Source: Personal elaboration.

57.5% (n=23) declared an excellent attitude, 35.0% (n=14) acceptable, and 7.5% (n=3) poor. (Table 3)

Table 3. Attitude toward ICT in 4th year Nursing students

Attitude level	n	%
Poor	3	7,5
Acceptable	14	35,0
Excellent	23	57,5

Source: Personal elaboration.

DISCUSSION

The results of this study show that fourth-year Nursing students at the University of Medical Sciences of Matanzas have a predominantly

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excellent attitude (57.5%) toward information and communication technologies (ICT), accompanied by high levels of knowledge (75%) and use (70%). These findings respond to the proposed objective and confirm the existence of a favorable disposition in the studied population.

The high proportion of students with excellent attitude coincides with previous research in the Cuban context. Rachid Guerra et al. [7] characterized the use of ICT in Nursing students at the University of Medical Sciences of Santiago de Cuba and concluded that the introduction of these technologies in the classroom favors the development of collaborative learning and teamwork. Likewise, Navarro et al. [8] described mobile digital learning as a current and relevant tool in Cuban medical education, which reinforces the favorable trend observed in this study.

Internationally, Cruz-Barrientos et al. [6], in a cross-sectional correlational study conducted with 242 nursing students at the University of Cádiz (Spain), found that the level of knowledge, use, and attitude toward ICT is good regarding communication technologies and interpersonal relationships, although low regarding specific educational programs. The authors of this paper agree that, although general levels are high, there remains a discrepancy between declared knowledge and effective use of ICT for academic purposes.

Similarly, Hernández Ramírez et al. [9] demonstrated, in a cross-sectional descriptive study with 100 Mexican Nursing students, a high dependence on the use of ICT for messaging and social networks (daily WhatsApp in 66% of participants), although 98% considered the use of the Internet through these devices useful for educational purposes. This finding suggests that the positive attitude is high, but actual use remains predominantly oriented toward interpersonal communication.

Regarding the level of knowledge, 75% of students reached the high category, while no participant was in the low level. This result corresponds with what was pointed out by Raghunathan et al. (10), who in a descriptive exploratory study conducted in Australia found that computer competence and information literacy skills are relevant for nursing practice, although with different levels of competence among students. The authors of this paper consider that the high

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percentage of high knowledge may be influenced by early exposure to ICT in previous educational levels, as well as by the computerization strategies implemented in Cuban higher education.

A finding that deserves special attention is the discrepancy observed between knowledge and use: although no student presented low knowledge, 5% (n=2) reported low use of ICT. This phenomenon has been previously reported in the scientific literature. Gordiichuk et al. (11) demonstrated, after implementing updated health informatics curricula in Ukraine, that students' digital competence increased by 71% after the educational intervention, indicating that specific training can close the gap between theoretical knowledge and effective use. The authors of this paper agree that the small group with low use could benefit from focused educational interventions aimed at transferring declared knowledge into concrete academic practices.

Regarding attitude toward technologies, the findings are consistent with the most recent literature. Yigit et al. [12] in a descriptive study conducted with 552 nursing students in Turkey (2024), found that 79.2% of students wished that subjects related to artificial intelligence were included in the curricula, showing a high willingness to incorporate new technologies into their training. This high willingness is similar to the excellent attitude found in this paper and suggests that nursing students, both in Cuba and in other countries, are receptive to technological innovation in their educational process.

The authors recognize several limitations that should be considered when interpreting the results. First, the sample size is small (n=40) and restricted to a single academic year of one degree program and university sites, which limits the generalization of findings to other populations of medical science students. Second, the cross-sectional design prevents assessing attitudinal changes over time or establishing causal relationships between the variables studied. Third, the use of a self-administered questionnaire could have introduced social desirability bias, despite the measures taken to minimize it (emphasis on the absence of correct answers, absence of the teacher during application). Fourth, the correlation between attitude toward ICT and academic performance was not evaluated, which would have allowed a better understanding of the real impact of these technologies on learning.

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Despite these limitations, the results have relevant practical implications for the University of Medical Sciences of Matanzas and for other higher medical education institutions in Cuba. The high prevalence of excellent attitude and high knowledge suggests that students are prepared to receive teaching strategies that actively integrate ICT, such as flipped learning, virtual learning environments, or technology-mediated clinical simulation. Teachers and curriculum designers can take advantage of this favorable disposition to advance the implementation of the guidelines established in national regulations [4,5], in line with what is recommended in the international literature that supports the updating of curricula to enhance the development of digital competence in undergraduate education [9,10]. Likewise, the identification of a small percentage of students with poor attitude (7.5%) and low use (5%) allows guiding differentiated educational actions, aimed at this subgroup, which could include digital literacy workshops and personalized tutoring.

Future studies should expand the sample to include all years of the Nursing degree program, as well as other degree programs at the University of Medical Sciences of Matanzas (Medicine, Dentistry, Health Technologies). Longitudinal designs are recommended to evaluate attitudinal changes before and after educational interventions based on ICT. Furthermore, it would be valuable to incorporate academic performance measurements to analyze their correlation with attitude, knowledge, and use of technologies. Finally, it is suggested to complement quantitative data with qualitative methods (focus groups, interviews) to explore in depth the barriers and facilitators perceived by students in the academic use of ICT.

CONCLUSIONS

Fourth-year Nursing students show a predominantly excellent attitude toward ICT (57.5%), with high levels of knowledge (75%) and use (70%). There is a favorable basis for the computerization of the educational process, although a small discrepancy between knowledge and use is detected in 5% of participants. These findings allow guiding differentiated educational interventions and support the implementation of technology-mediated teaching strategies, in correspondence with national guidelines for higher education in medical sciences.

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AUTHORSHIP CONTRIBUTION

CLVH: Conceptualization, data curation, investigation, formal analysis, and writing.

MHR: Conceptualization, supervision, formal analysis, and writing.

LRDH: Conceptualization, writing, supervision.

JAMF: Conceptualization, writing, supervision.

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CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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