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Abstract

The purpose of this study was to investigate the ethical tendencies of medical faculty students, their unethical use of information and communication technologies, and their attitudes toward digital ethics in terms of certain variables. The study was designed using a relational survey model. The research group consisted of 335 medical faculty students studying at a state university in Turkey. Data were collected using the "Personal Information Form," the "Ethical Tendencies Scale," Information and Communication Technologies Ethics Scale," and "Attitude towards Digital Ethics Scale." The data analysis revealed that medical faculty students' digital ethical attitudes and ethical tendencies were at a high level and positive, while their unethical use of information and communication technologies was at a very low level. The study's findings indicated that there were gender-related differences in medical students' unethical use of ICT. In addition, there were significant differences in the ethical tendencies of the participating students based on the variable of year of study. Lastly, medical students' unethical use of information and communication technologies were significantly affected by their ethical tendencies and attitudes towards digital ethics.

Introduction

Today, with the widespread use of science and technology, ethical decision-making has become increasingly complex for health professionals serving human beings. The complex healthcare system in the modern era requires healthcare professionals to have strong ethical judgement and skills. As future healthcare professionals, medical students are expected to have a high level of moral sensitivity and be able to provide holistic care to patients based on ethical decision-making skills, as they will encounter ethically challenging health situations in their work environment (Ercan et al., 2020; Giubilini et al., 2016; Shelp et al., 1981).

It is now more challenging for physicians to deliver healthcare services in all these settings with a professional, ethical approach, and ethical dilemmas have become widespread (Favia et al., 2013). Physicians must be able to identify the moral and ethical implications of various circumstances and decide how best to proceed based on

moral theories and ethical principles (Glick, 1994). Thus, a key component of medical education is encouraging and creating morally sound health practices. In this regard, educators must assist medical students in developing their moral character, their ability to reason, their behaviours, and their ability to find solutions by acknowledging the issues and challenges they face (Bickel, 1991; Majeed et al., 2020; Su & Köse, 2021). Trevino (1986) defined ethical behaviour as acting in conformity with principles, norms, and standards that are recognized by the public and used in the business community. While the exact standards, principles, and norms remain unclear, there is a widespread agreement and most of the standards have already been stated in legal or international agreements.

The values embraced by society shape the ethical foundation of communication. These guidelines also apply to the evolution of societal communication processes. Multiple communication channels form the conceptual foundation of communication ethics. Within specific guidelines, communication ethics regulates every type of communication tool that can be thought of, including megaphones, interactive communication, one-way communication, mass communication, and face-to-face interaction (Christians & Merrill, 2009; Erdem & Özer Şanal, 2023; Johannesen et al., 2008). Every action we take in daily life falls under the category of ethics, since the science of law does not define its boundaries. In the conceptual framework of today, as digitalization shapes and modifies everyday habits, it makes sense to digitalize ethics at the same time. However, it is possible that the moral climate that has persisted in the traditional world is insufficient to assess actions in the digital age (Borţea, 2021; Capurro, 2017; Molacı, 2018). At this point, Rogerson offers several recommendations for the current ethics that still require development. These include giving students access to digital education, adding new informational messages about search engines and other information sources, and defining boundaries for circumstances in which making moral decisions is challenging (Rogerson, 1996).

The relationship between technology and ethics has been examined in the context of different fields of study due to the rapid development of technology, particularly information studies (Knobel & Bowker, 2011), human computer interaction (Friedman et al., 2006), and media studies (Nissenbaum & Gaboury, 2012). It is a well-known fact that as ICT (Information and communications technology) has influenced our lives, a new culture and area of interaction that was not previously a part of everyday life has developed. This reality highlights the need for developing new solutions to address some modern, major ethical problems. Regarding this, it is essential to raise awareness by defining these new challenges and to conduct a thorough analysis of the resolution of relevant ethical issues, starting from the point of emergence and ending with the outcomes (Nnaji, 2012; Schultz, 2005; Strand & Kaiser, 2015).

According to TUIK's (Turkish Statistical Institute) 2020 "Survey on the use of information technologies in households," internet usage has risen to 79% of all households across the country. It is evident from TUIK (2020) research that people who actively participate in digital life seek to fully utilize the benefits of information technologies. However, even though information technologies benefit society greatly, the primary emphasis should be on using them ethically and without causing harm to others (Moor, 2005; Wright et al., 2014).

The internalisation and safe use of new communication technologies by everyone depends on the internalisation of the basic ethical norms and standards mentioned in this field and not compromising on these principles under

any circumstances (Pavlik, 2001). Due to the rapid development in technology, the relationship between technology and ethics has been addressed in the context of different research fields, especially information studies (Knobel & Bowker, 2011), human computer interaction (Friedman et al., 2006) and media studies (Flanagan et al., 2008; Nissenbaum & Gaboury, 2012).

Reviewing the relevant literature shows that ICT ethics and general ethics have similar effects on a broad range of situations and are closely related to interaction behaviour in real and virtual settings as well as environmental factors (Hanna & Kazim, 2021; Teran et al., 2021). It is important to first review the research carried out in the field of computer and internet ethics to understand the ethical problems which arise in communication through virtual environments. ICT ethics generally refers to efforts to develop suitable formulae and valid policies to investigate the social effects of computer technology and to ensure the use of computer technology for ethical purposes (Moor, 2004). This is in addition to the adoption of various approaches (Maner, 1996) in researching and defining ICT ethics. Mason (1986) assessed the ethical issues raised by developments in technology using four primary criteria, concluding that intellectual property, privacy, access, and accuracy factors were the frameworks in which unethical behaviours developed. The effects of these elements, as well as the social effects of computers, security, quality, information, and network accuracy factors, on the emergence of unethical behaviours have been demonstrated by later research.

Fuchs (2018) defines digital ethics as a person's capacity to perform, exemplify, adapt, rationalise, consider, and improve digital governance (netiquette) in daily life. Ethics in cyberspace (netiquette), just like ethical rules in the real world, encourages users to follow ethical and moral rules to create a comfortable and peaceful common space on all digital platforms. In practice, it is certain that students will spend a lot of time in the digital world, and this will have both positive and negative effects. According to James et al. (2010), the ethics of speaking or communicating in online learning prioritises being honest and straightforward, not taking advantage of circumstances, being good and truthful as well as the accuracy of messages. Ethics in communication is not just about eloquence, but also includes sincere intentions expressed through calmness, patience, and empathy (Mansyur et al., 2022).

Individuals' approaches to ethics change when the concept of digital ethics is viewed from a social perspective, considering variables like age, social origin, and economic status. In the digital age, the ethical phenomenon that exists in real-world social interactions is entirely different (Fuchs, 2022; Luke et al., 2017). Because the opportunities that the digital world offers its users are quite different from the rights that people enjoy in the real world. The human factor is the primary cause of the phenomenon of digital ethics in new media technologies. An essential distinction between the concept of digital ethics and real social life is made by the fundamental freedoms and rights of individuals, the roles played by the media, and the availability of information.

Efforts to improve the awareness and positive behaviours of today's students, who interact intensively with information technologies, regarding information communication and digital ethics will prevent possible problems in the future (Sivin & Bialo, 1992). Within this framework, the general ethical tendencies of medical students who will take an active role in health services in the future and their qualifications on the ethical use of information

technologies become more important. The significance of this study is increased by the paucity of research in the literature investigating medical students' attitudes towards digital ethics and ethical use of information technologies. Thus, the purpose of this study is to determine medical students' ethical tendencies, level of ethical information technology use, and attitudes towards digital ethics. Thus, a variety of variables were used to analyze the ethical tendencies, unethical use of information and communication technologies, and medical students' attitudes towards digital ethics.

This study aimed to investigate medical students' attitude towards digital ethics, unethical use of ICT, and ethical tendencies in relation to various variables. To achieve this aim, answers to the following questions were sought:

1. What is medical students' ethical tendencies, unethical use of information and communication technologies and attitudes towards digital ethics?
2. Do medical students' ethical tendencies, unethical use of information and communication technologies and attitudes towards digital ethics differ by gender?
3. Do medical students' ethical tendencies, unethical use of information and communication technologies and attitudes towards digital ethics differ by year of study?

Method

The study used a relational survey model based on the quantitative paradigm. Survey models are a type of research that seeks to describe a past or current situation in its entirety, as well as to define the characteristics, opinions, attitudes, skills of the research participants within their own context (Fowler, 2013). The relational survey used in this study is a survey model that seeks to determine the presence and/or degree of change between two or more variables (Nardi, 2018).

In the quantitative dimension of the research, it was decided to use the relational screening model, considering that it would enable the examination of medical students' ethical tendencies, unethical use of information and communication technologies, and attitudes toward digital ethics based on the variables of gender and year of study. The 'Attitude towards Digital Ethics Scale', 'Unethical Use of Information and Communication Technologies Scale' and 'Ethical Tendencies Scale' were used to gather data regarding medical students' attitudes toward digital ethics.

The study's participants consist of medical students studying at a Turkish university in the academic year 2023/2024. Due to the difficulty of reaching the entire population, time constraints, and cost, a sample of the target population was studied. The study's sample consists of 335 students at the Faculty of Medicine, Necmettin Erbakan University, during 2023-2024 academic year. The sample was chosen using a convenient sampling technique, which is a non-probability-based sampling method. Convenient sampling technique is one that allows the researcher to access participants easily in terms of time and space (Fraenkel & Wallen, 2003). Before the research, written permission was obtained from the Ethics Committee (Date: 05.01.2024, Decision Number: 2024/4904).

Data Tools

Attitude towards Digital Ethics Scale

The study employed Tunç's (2022) measurement tool, which was designed based on Ribble's (2011) tool, to assess medical students' attitudes toward digital ethics. At the beginning of this research, the digital ethics dimension was viewed as a sub-dimension of digital citizenship. Later in the study, it was decided to expand the scale beyond the dimensions and items developed for the digital citizenship scale to assess attitudes towards digital ethics. The Attitude towards Digital Ethics Scale (AtDES) is a one-dimensional Likert-form scale with nine items. The AtDES items were collected in a one-dimensional structure, with the highest factor loading value of .774 and the lowest being .393. Cronbach The Alpha value of AtDES was .761.

Ethical Tendencies Scale

Koçyiğit and Karadağ (2016) developed a measurement tool to assess medical students' ethical tendencies. The responses on the scale, which is scored on a 5-point Likert scale, are distributed as strongly disagree (1), disagree (2), undecided (3), agree (4), and strongly agree (5). Following the item discrimination test, exploratory and confirmatory factor analyses were performed to ensure the scale's construct validity. The scale consisted of 26 items across three dimensions. Cronbach Alpha reliability values were calculated to determine the scale's reliability. The Cronbach Alpha values for the factors were .74 for teleological ethics, .67 for deontological ethics, and .73 for virtue ethics. In this study, the reliability coefficients ranged between .71 and .78.

Information and Communication Technologies Scale

To determine students' ethical use of information and communication technologies, Torun (2014) developed the 'Information and Communication Technologies Ethics Scale', which attempted to reveal unethical use of Information and Communication Technologies (ICT). This scale, which has 28 items, was created using a five-point Likert scale with values ranging from 1 to 5. Each item in the scale expresses unethical use of ICT. The exploratory factor analysis conducted for medical students revealed that the scale had a uni-dimensional structure and contained 20 items. Torun (2014) calculated a Cronbach Alpha value of 0.937 for the scale, indicating its reliability. In this study, the Cronbach's Alpha value used to assess the scale's reliability was 0.87 for the whole scale.

Data Analysis

The data from this study were analysed using the SPSS-27 package programme. Data were analysed using descriptive and inferential statistics. The independent variables of gender and year of study of medical students, as well as the mean scores and standard deviations related to ethical tendency, unethical use of information and communication technologies, and attitudes towards digital ethics, were considered in the independent samples t-test and one-way analysis of variance (ANOVA) tests. Multiple regression analysis was used to investigate the relationships between ethical tendencies, unethical use of information and communication technologies, and

attitudes towards digital ethics. Before starting the analyses, the assumptions of the related analyses were verified. The significance level was accepted at $p < 0.05$.

Findings

Table 1 shows descriptive analyses of medical students' ethical tendencies, unethical behavior levels when using information and communication technologies, and attitudes towards digital ethics. Tables 2 and 3 compare participant students' ethical tendencies, unethical use of information and communication technologies, and attitudes towards digital ethics based on the variables of gender and year of study. Table 4 shows the results of a multiple regression analysis of the relationships between ethical tendencies, unethical use of information and communication technologies, and attitudes toward digital ethics.

Table 1. Medical Students' Ethical Tendencies, Unethical Use of Using Information and Communication Technologies and Attitudes towards Digital Ethics

	N	Minimum	Maximum	Mean	Std. Deviation
Teleological Ethics	335	1.40	5.00	3.45	0.74
Deontological Ethics	335	1.43	5.00	3.64	0.65
Virtue Ethics	335	1.00	5.00	3.89	0.65
Ethical Tendency	335	1.44	5.00	3.66	0.60
Unethical Use of ICT	335	1.00	4.96	1.42	0.70
Attitudes towards Digital Ethics	335	1.00	5.00	4.32	0.69

Table 2 displays the descriptive statistical results of the medical students' scores on the scales of ethical tendencies, unethical use of information and communication technologies, and attitudes towards digital ethics. The mean ethical tendencies scale scores 3.45±0.74, 3.64±0.65, 3.89±0.65, and 3.66±0.60. According to these mean values, the medical students demonstrated high ethical tendencies. Students scored 1.42±0.70 for unethical use of information and communication technologies. This mean value indicates that participants' unethical use of information and communication technologies was at a very low level. The mean score for participants' attitudes towards digital ethics was 4.32±0.69. This value demonstrates that medical students had high and positive attitudes towards digital ethics.

Table 2. Ethical Tendencies, Unethical Use of Information and Communication Technologies and Attitudes towards Digital Ethics by Gender

Variable	Gender	N	Mean	Std. Deviation	t	p
Teleological Ethics	Female	195	3.47	0.67	0.43	0.66
	Male	139	3.43	0.83		
Deontological Ethics	Female	195	3.64	0.62	0.34	0.74
	Male	139	3.62	0.69		
Virtue Ethics	Female	195	3.87	0.64	-0.56	0.58

Variable	Gender	N	Mean	Std. Deviation	t	p
	Male	139	3.91	0.67		
Ethical Tendency	Female	195	3.66	0.56	0.10	0.92
	Male	139	3.65	0.64		
Unethical Use of ICT	Female	195	1.35	0.63	-2.38	0.02
	Male	139	1.53	0.79		
Attitudes towards	Female	195	4.34	0.72	0.86	0.39
Digital Ethics	Male	139	4.28	0.64		

The Independent Samples t-test results in Table 3 show that medical students' ethical tendencies, unethical use of information and communication technologies, and attitudes towards digital ethics did not differ by gender ($p>0.05$).

Table 3. Ethical Tendencies, Unethical Use of Information and Communication Technologies, and Attitudes towards Digital Ethics by Year of Study

Variable	Year of Study	N	Mean	Std. Deviation	F	p
Teleological Ethics	1	34	3.31	0.72	5.013	0.000
	2	153	3.62	0.74		
	3	16	3.30	0.86		
	4	53	3.57	0.74		
	5	76	3.16	0.65		
Deontological Ethics	1	34	3.56	0.65	2.868	0.015
	2	153	3.77	0.69		
	3	16	3.54	0.75		
	4	53	3.63	0.60		
	5	76	3.43	0.52		
Virtue Ethics	1	34	3.91	0.59	0.509	0.769
	2	153	3.94	0.70		
	3	16	3.94	0.78		
	4	53	3.81	0.67		
	5	76	3.83	0.51		
Ethical Tendency	1	34	3.59	0.54	2.721	0.020
	2	153	3.77	0.65		
	3	16	3.60	0.76		
	4	53	3.67	0.56		
	5	74	3.47	0.44		
Unethical Use of ICT	1	34	1.36	0.64	1.905	0.093
	2	153	1.53	0.83		
	3	16	1.12	0.11		

Variable	Year of Study	N	Mean	Std. Deviation	F	p
	4	53	1.34	0.49		
	5	74	1.32	0.57		
Attitudes towards	1	34	4.29	0.83	0.784	0.562
Digital Ethics	2	153	4.30	0.74		
	3	16	4.62	0.39		
	4	53	4.30	0.65		
	5	74	4.34	0.54		

The F test analyses in Table 3 compared medical students' ethical tendencies, unethical use of information and communication technologies, and attitudes towards digital ethics based on their year of study. Theological and deontological ethics, as well as total mean scores on the ethical tendencies scale, differed significantly by the year of study ($p<0.05$). However, there was no significant difference in the participant students' unethical use of information and communication technologies and attitudes towards digital ethics scores based on the variable of year of study.

Table 4. Relationships between Medical Students' Ethical Tendencies, Attitudes towards Digital Ethics and Unethical Use of Information and Communication Technologies

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	3.323	0.264		12.597	0.000
Ethical Tendency	0.062	0.060	0.053	1.044	0.297
Attitudes towards Digital Ethics	-0.493	0.052	-0.483	-9.502	0.000

$R=0.47$; $R^2=0.22$; $F= 46.99$; $p<0.05$

Table 4 displays the results of a multiple regression analysis of medical students' ethical tendencies and attitudes towards digital ethics to predict unethical use of information and communication technologies. Ethical tendencies and attitudes towards digital ethics were found to significantly predict unethical use of information and communication technologies ($F= 46.99$; $p<.05$). These two variables account for 22% of the change in unethical use of information and communication technologies. The analysis found that attitudes towards digital ethics ($\beta=-.048$; $p<.05$) had a significant effect on unethical use of information and communication technologies. Attitude towards digital ethics is the variable that significantly influences and predicts unethical use of information and communication technologies, based on the β and t values in the analyses ($\beta=-.048$; $p<.05$).

Discussion and Conclusion

In this study, ethical tendencies of medical students, their unethical use of information and communication technologies and their attitudes towards digital ethics were examined. The study's results indicated that the ethical tendencies and attitude towards digital ethics of medical students were positive, while their unethical use of

information and communication technologies were very low. The findings of the present study are consistent with the findings of studies by Beigy et al. (2016), Culver et al. (1985), Miles et al. (1989), and Roberts et al. (2004). Evidence in the literature shows that medical students and interns have a great interest in various ethical issues, have a high level of sensitivity, and are interested in learning practical preparation skills for ethical decision making in clinical situations (Beigy et al., 2016; Roberts et al., 2004). Chin et al. (2011) found that 78.8% of the students had a very high sensitivity to ethics and thought that ethics education was an important requirement of medical education. In a study conducted on undergraduate students in a West Bengal medical school, 83.5% of the students stated that ethical awareness is primarily important for their future profession (Chatterjee, B., & Sarkar, 2012).

Another finding of the study is the comparison of ethical tendencies, unethical use of information and communication technologies and digital attitudes of medical faculty students by gender. According to the findings of the study, no significant difference was found in the ethical tendencies and digital attitudes of the participant students based on gender. However, male students scored higher in terms of unethical use of information and communication technologies. The studies conducted by Cilliers (2017), Krisanda & Peslak (2009), Lau & Yuen, (2014), Özbay et al. (2021) and Siponen & Vartiainen (2005) on these variables corroborates the findings of this study. According to Kim and Kim (20015), males exhibit unethical behaviours such as using unlicensed software, hacking, among others more than females. It was also found that male university students use information technologies in academic plagiarism more than their female peers (Jensen et al., 2002).

The study's other finding is a comparison of medical faculty students' ethical tendencies, unethical use of information and communication technologies, and digital attitudes based on year of study. The study's conclusions indicate that there was a significant difference in the students' ethical tendencies based on year of study. Regarding this variable, second and fourth-year students had higher mean scores than their peers in other years of study. However, participant students' unethical use of information and communication technologies and attitudes towards digital ethics did not differ significantly based on the year of study. The fact that the majority of the medical students in the study group were in the same age range may have contributed to the results, particularly with regard to attitude towards digital ethics and unethical use of information and communication technologies. James et al. (2009) argue that since young people have comparable levels of knowledge about digital competencies from an early age, there should be similarities in their ethical behaviour in this area as well. In general, the findings of the study are consistent with the studies conducted by Khalil and Seleim (2012), Knezek and Christensen (2016). In this study, it was stated that the effect of demographic variables on digital ethics awareness was limited. The study shows that medical students' unethical use of information and communication technologies and their attitudes towards digital ethics remain consistent across a wide range of demographic and environmental factors.

The relationship between medical students' attitudes towards digital ethics, their unethical use of ICT, and their ethical tendencies was examined in the study's conclusion. Multiple regression analysis revealed that unethical use of ICT was significantly predicted by medical students' ethical tendencies and attitudes towards digital ethics. Additional analysis indicates that participating students' unethical use of information and communication technologies decreases as their positive attitudes towards digital ethics rise. Luke (2018) argues that unethical use

of information technologies, rather than people's skills or technological competencies, is the fundamental cause of problems related to their use. Thus, it is reasonable to regard digital ethics as a core issue of the educational curriculum. There is a lack of instruction on digital ethics in both medical education and general education (Abd Aziz et al., 2011; Pérez-Garcias & Marín, 2016). In this regard, it is believed that it is essential to take ethical concerns regarding the use of information technologies into account as well as to enhance medical students' understanding of and conduct regarding digital ethics. The results emphasize the need for universal approaches for students as well as the standardization of digital ethics education and the ethical use of ICT in medical education policies and programs. It is recommended that more research be conducted on the ethical use of ICT and digital ethics in medical education, as well as in various educational and technological contexts.

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