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Edited by

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Editors' Note: Volume 9 – Issue 2

This Issue of the IAFOR's Journal of Psychology & the Behavioral Sciences covers a variety of empirical studies about applications of psychological theories in educational and mental health settings. Moreover, the journal highlights studies that investigate topics regarding issues related to communication, education, self-efficacy, and marriage. The *IAFOR Journal of Psychology & the Behavioral Sciences* is a peer-reviewed, editorially independent, and an interdisciplinary journal associated with the IAFOR (The International Academic Forum) conferences on Psychology and the Behavioral Sciences. This issue is devoted to several interdisciplinary studies which represent diverse topics, cultures, and disciplines in the fields of psychology and the behavioral sciences. All manuscripts published in the journal have been subjected to the thorough and accepted processes of academic peer review. Some of the articles are original, and some are significantly revised versions of previously presented papers or published reports in the IAFOR's conferences and proceedings.

We want to express our sincere appreciation to all reviewers for taking time from their busy schedules to review each assigned manuscript and offer their professional expertise and recommendations for improvement of these published articles. Also, we like to take this opportunity to acknowledge the hard work of our support who were involved with the publication of this journal.

Please note that we are seeking manuscripts for our upcoming Fall 2024 issue. Below is the link to the journal's web page for your attention; please review this web page to become familiar with the journal's objectives and the submission guidelines for authors: https://iafor.org/journal/iafor-journal-of-psychology-and-the-behavioral-sciences/about/

If you have any questions, please do not hesitate to contact us, otherwise please send your manuscript to the journal's editors below. Thank you for considering this invitation, and we look forward to hearing from you soon.

Best Regards,

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Examining Junior High School Students' Personality Factors as Predictive Indices of Adolescent Digital Technology Interaction and Importance

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Emerging Adults' Views of Marriage: Influence of Religion and Sexual History

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Abstract

Historically, religion has had a significant influence on mating strategies. As current trends show a shift away from social institutions as the guiding constructs for value formation, the role of religiosity as a moderator for perceptions of marriage, premarital sexual activity, and cohabitation outside of marriage needs to be revisited. The current study examines the association of religiosity, as assessed with the Duke University Religion Index (DUREL), and attitudes toward marriage, the perceived ideal age to marry, and sexual activity. All three dimensions of the DUREL (Organized Religious Activity, Non-Organized (Informal) Religious Activity, and Intrinsic Spirituality) were associated with more positive attitudes toward marriage. Participation in organized religious activity was associated with a later age for beginning sexual activity and fewer sexual partners.

Keywords: marriage, religiosity, emerging adults

Emerging adulthood, typically defined as the period between ages 18 and 29 years, is a time for exploring values and relationships (Arnett, 2018). Today's emerging adults often question traditional values such as religion (Arnett, 2018) and the importance of marriage (Arnett, 2019; Sniffed-Krenke, 2010). The current study examines the associations between religiosity and marital attitudes, young adults' perceptions of the optimal age to marry, and patterns of sexual activity.

Religiosity

A growing number of emerging adults are experiencing irreligion, ranging from indifference to rejection of or hostility toward religious beliefs (Bengtson, 2018). Religion has decreased significantly in importance for young adults over the past two decades and appears to continue to decline through emerging adulthood. The Higher Educational Research Institute reported in 2005 that most first-year college students attended religious services, believed in God, and cited their beliefs as providing strength and guidance. More recent surveys (Pew Research Center, 2015) found that 36 percent of young adults were religiously unaffiliated, the highest percentage among all demographic groups (Arnett, 2018).

Religiosity encompasses specific behavior (e.g., attendance at formal religious services, prayer, reading sacred texts) practiced in accordance with beliefs and modes of social organization (Miller & Thoresen, 2003). However, Arnett and Jensen's (2002; 2015) research suggests that today's emerging adults are shunning institutional participation and dogma-related activities in favor of more personalized forms of religious self-expression. This divergence may be promoted by social influences at college, as individuals with a high or low religiosity continue to grow in the direction of their original disposition. In addition, this pattern may reflect a propensity to affiliate with others in the college environment that confirm and support one's beliefs through shared attitudes (Astin, 1993).

Views of Marriage Among Emerging Adults

Marital attitudes are the opinions one holds regarding marriage as an institution. Positive attitudes typically include a desire to marry in the future and a view of marriage as a significant source of life satisfaction (Gubernskaya, 2020). However, demographic data suggest that these attitudes are changing. The trend of delaying marriage is evident in data from the United States Census Bureau (2020), indicating that the age at first marriage has increased dramatically and steadily over the last forty years. In 1975, the median age to marry was 21.1 years for females and 23.5 years for males. In 2020, the median age for first marriage was 28.1 years for females and 30.5 years for males.

Kefalas and colleagues (2011) qualitatively examined young adults' marriage attitudes. Based on their findings, respondents fell into one of two groups-- marriage naturalists and marriage planners. Marriage naturalists, typically from rural environments, viewed matrimony as the expected outcome of a steady relationship. As a result, naturalists tended to marry in their early 20s. In contrast, marriage planners, typically residing in metropolitan areas, required economic

stability and emotional maturity as a precursor to matrimony. As a result, planners screened potential spouses through premarital sex/romance and cohabitation while completing university and graduate education and establishing financial independence. As a result, marriage planners delayed marriage until the late 20s or early 30s.

While census data suggest a marriage decline during the past decade (U.S. Census, 2020), it is difficult to discern how much this decline stems from not marrying or delayed matrimony. Past surveys suggest that young adults may not be rejecting marriage; they are just waiting longer to marry. For example, in 2010, over two-thirds (69%) of unmarried adults aged 18-29 years reported wanting to marry (Taylor, 2010), and eight in ten young adults believed that marriage was important (Scott et al., 2009).

Religiosity, Marital Attitudes, and Sexual Activity

Compared with adults identifying as atheists or agnostic, those identifying as Christian reported more favorable attitudes toward marriage (Mosko & Pistole, 2010). Several studies have shown a relationship between religiosity and the age at which couples marry. Couples reporting greater religious commitment – as determined by religious service attendance and viewing the Bible as authoritative – are more likely to marry at an earlier age (Eggebeen & Dew, 2009; Thornton et al., 2007). Furthermore, persons higher in religiosity reported an earlier "ideal" age for marriage. Similarly, adolescents more involved in church activities were more likely to report a desire to get married at a younger age than individuals who were not as religiously invested (MacArthur, 2009).

Two religions most associated with early marriage, conservative Protestants and Mormons (Xu et al., 2005), do not view financial stability and career establishment as prerequisites for marriage. Instead, members of these denominations profess to trust in Scriptural passages such as Matthew 6:31-33, "'What shall we eat?' or 'What shall we drink?' or 'What shall we wear?'... [Your] heavenly Father knows that you need them. But seek first his kingdom and righteousness, and all these things will be given to you as well" (Uecker, 2014).

In most religions, sexuality is a moral issue (Hardy & Willoughby, 2017). Many conservative Christian denominations reserve sex solely for marriage. Non-marital sex and unmarried cohabitation are considered immoral. While cohabitation may be an option for some couples, non-cohabitors may be more likely to marry early (Uecker, 2014). Previous studies have found that college students highly involved in religious activities are more likely to view premarital sex negatively (Beckwith & Morrow, 2005).

Religiously involved young adults report higher levels of sexual abstinence (Mueller et al., 2010) and fewer sexual partners (Davidson, 2019). For example, attending religious services is associated with fewer sexual partners in the past three months among college students (Murray et al., 2007). There is also evidence that higher religiosity delays first sexual intercourse for females with less consistent effects for males (Rostosky et al., 2004). While the explanation for these associations is likely complex, Hull and colleagues (2011) suggest that

those higher in religiosity are less likely to connect being sexually active to self-esteem or relationship commitment.

Current Study

While the association between religiosity and sexual behavior has been well-studied, emerging adults' perceptions of marriage have not been examined within this context. Therefore, the purpose of the current study was to investigate the association of religiosity (as measured by the Duke University Religion Index (DUREL; Koenig & Bussing, 2010) attitudes toward marriage, the perceived ideal age to marry, and sexual activity.

Methodology

Participants

The participants in the sample included 84 undergraduate students from a rural Midwestern University in the United States. The university from which the sample was drawn reports the following racial/ethnic student composition: Native American, 9%; Asian, 1%; Black/African American, 2%; Hispanic, 2%; White, 80%; Unknown, 6%. There were 27 males and 57 females with a mean age of 21.19 years (SD = 5.24 years).

Instruments

1. Demographic questionnaire and Ideal Age to Marry
   Participants completed a survey requesting their age, gender, marital status, and year in college, as well as their opinion about the ideal age of marriage. They were asked to indicate whether they thought marriage should occur at a certain age or whether they had no intention of marrying (MacArthur, 2009).

2. Marital Attitudes Scale (MAS; Braaten & Rosén, 1998)
   The MAS is a 23-item self-report questionnaire assessing individuals' attitudes and opinions of marriage utilizing a 4-point rating scale (1=Strongly Agree; 4=Strongly Disagree). The MAS demonstrated high internal consistency with an alpha coefficient α of .82 and test-retest reliability of .85 over six weeks (Bassett et al., 1999). In addition, criterion and construct validity are suggested by a high correlation with the Marital Satisfaction Inventory (Snyder & Aikman, 1999) and a moderate association with the Religious Influence on Marriage score (Hinson, 2017).

3. Behavioral Risk Factor Surveillance System (BRFSS Codebook Report; CDC, 2003)
   Three questions based upon the BRFSS Codebook Report were chosen to determine participants' sexual experience. Questions included whether the participant had previously had sexual intercourse, the age at which sexual activity was initiated, and the number of sexual partners. Questions were edited to better pertain to college students rather than the general population.

4. Duke University Religion Index (DUREL; Koenig et al., 1997)
    The DUREL is a brief 5-item measure assessing three dimensions of religiosity: organized religious activity, non-organized religious activity, and intrinsic religiosity. Items are rated as 1 to 5 or 6, with higher scores indicating greater religious involvement. Koenig and Bussing (2010) found the scale to have a high test-retest reliability of .91 for two weeks and high internal consistency of .71-.91. A study by Lace and Handal (2018) established convergent validity among the three DUREL dimensions.

Procedure

Prior to completing the questionnaires, all participants provided informed consent documented in writing. Participants completed all questions during one session in a small classroom setting. Participants were asked to complete the demographic form and indicate the ideal age to marry before completing the other questionnaires. The other three questionnaires (DUREL, MAS, and BRFSS sexual behavior questions) were presented in a counterbalanced order.

Results

Table 1 provides the mean scores and standard deviations for all the study variables. This sample with a mean age of 21.19 years (range of 18 to 35 years) reported an Ideal Age for Marriage of 25.66 years. Table 2 presents a correlation matrix for scores on all variables. The reported Ideal Age to Marry was not significantly related to any of the variables except Age. However, older respondents reported a later ideal age for entering marriage.

Table 1
Means and Standard Deviations for All Variables

Variable	N	Mean	SD
Ideal Age	79	25.66	2.79
Age	85	21.19	5.24
MAS[a]	85	71.11	7.53
Age-First Sexual Activity	68	16.10	1.58
Number-Sexual Partners	85	2.51	2.28
DUREL 1[b]	85	3.11	1.66
DUREL 2[c]	85	2.45	1.72
DUREL 3[d]	85	9.34	3.95

[a]MAS: Attitudes Towards Marriage, [b]DUREL 1: Organized Religiosity
[c]DUREL 2: Non-Organized Religiosity, [d]DUREL 3: Intrinsic Religiosity

Moderate positive correlations were obtained between each of the three DUREL indices and Marital Attitudes (MAS) scores: DUREL #1–Organized Religious Activity (.41); DUREL #2–Non-Organizational Religious Activity (.35) and DUREL #3–Intrinsic Religiosity (.44) Among the three DUREL variables: only Organized Religious Activity (DUREL #1) was significantly correlated with sexual behavior. Specifically, higher DUREL #1 scores were associated with a later age at first sexual activity (r=.28) and fewer lifetime sexual partners (r=-

.21). MAS scores were not significantly associated with either of the sexuality indices (See Table 2).

Table 2
Correlation Matrix for All Variables

	Ideal Age	Age	MAS[a]	Age-First Sexual Activity	Number-Sexual Partners	DUREL 1[b]	DUREL 2[c]	DUREL 3[d]
Ideal Age	1	.28*	-.17	.09	.11	.09	.09	.02
N	79	79	79	58	79	79	79	79
Age	.28	1	.03	-.12	.34**	-.11	-.07	.07
N	79	85	85	63	85	85	85	85
MAS	-.17	.03	1	.05	-.05	.41**	.35**	.44**
N	79	85	85	63	85	85	85	85
Age-First Sexual Activity	.09	-.12	.05	1	-.43**	.28*	.10	.19
N	58	63	63	63	63	63	63	63
Number - Sexual Partners	.11	.34**	-.05	-.44	1	-.22*	-.13	-.15
N	79	85	85	63	85	85	85	85
DUREL 1	-.09	-.11	.41**	.28*	-.22*	1	.68**	.67**
N	79	85	85	63	85	85	85	85
DUREL 2	-.09	-.07	.35**	.10	-.13	.68**	1	.71**
N	79	85	85	63	85	85	85	85
DUREL 3	.02	.07	.44**	.19	-.15	.67**	.71**	1
N	79	85	85	63	85	85	85	85

*p <.05, **p <. 01
[a]MAS: Attitudes Towards Marriage, [b]DUREL 1: Organized Religiosity
[c]DUREL 2: Non-Organized Religiosity, [d]DUREL 3: Intrinsic Religiosity

To examine the relative impact of religiosity and sexual behavior on marital attitudes, a stepwise regression equation with MAS as the dependent variable, three religiosity variables, and two sexual behavior variables as predictors were calculated. The resulting equation was statistically significant $R^2 = .22$; $F(5,57)=3.30$; $p<.001$. However, DUREL 3 (Intrinsic Religiosity) was the only significant predictor associated with the criterion, MAS (Standardized $\beta=.44$; $t=3.82$; $p<.001$). A stepwise regression was recalculated with only the DUREL scores as predictors and MAS as the criterion. The result was similar $F(1.83)=19.84$; with only the DUREL 3 emerging as the sole significant predictor (Standardized $\beta=.44$; $t=4.50$, $p<.001$).

Discussion

The current study examined the association between views of marriage, religiosity, and sexual activity among emerging adults. While previous studies have examined the association between religiosity and sexual behavior, the current study examined whether religiosity impacted participants' attitudes toward the institution of marriage.

Religion, sexuality, and identity converge as emerging adults participate in romantic relationships, which may lead to commitment in the form of marriage (Arnett, 2000). Most young adults expect to marry at some point in their lives (Arocho, 2021). However, A societal shift is also occurring among young adults in the Global North who are choosing to delay marriage. The U.S. Census Bureau (2020) estimated the median age at first marriage in 2020 to be 30.5 for males, with a margin of error of +/- .1 and 28.1 for females, a margin of error of +/- .2. Among the current sample with a mean age of 21.19 years, the perceived ideal age of marriage was significantly earlier at 25.66 years with a standard deviation of 2.79. Correlational analyses indicated that older respondents reported a later ideal age of marriage. Miller reported (2013) that while marriage is being delayed, the percentage of women married at 40 has remained constant. While the current study did not find a significant association between the perceived ideal age of marriage and religiosity, religious affiliation may influence the age of marriage. Some religious faiths and denominations do encourage marriage at an earlier age. For example, research has found that within the U.S., earlier marriage occurs among Mormons and conservative Protestants, with a later age of matrimony for mainline Protestants and Catholics (Ueker, 2014). While religious beliefs may be part of a decision to marry, it should be noted that the postponement of this significant life event has been described as the result of many factors, including an increase in post-high school education, increased debt, and the desire for an extended period of personal independence. In our study, there was no association between the reported ideal age of marriage and the other dimensions studied, including religiosity and sexual behavior.

In contrast, religiosity demonstrated a moderate and significant association with attitudes toward marriage. All three DUREL religious indices correlated with MAS approximately equally when analyzed separately. Religion influences global attitudes toward marriage, future marital plans, expectations of marriage, and assumptions about marriage (Prosser & Rosen, 2018). The current findings suggest that regular participation in formal, organized religious activity, private religious activities such as prayer and reading sacred texts, and the subjective experience of religion integrated with one's cognitive-emotional life and behavioral choices are associated with favorable views of marriage.

In contrast, with perceptions of marriage, religiosity's influence on sexual behavior was less pronounced. Of the three DUREL dimensions, only extrinsic religiosity, reflecting the frequency of engagement with formal religious institutions, demonstrated an association with sexuality. The modest yet significant correlations with DUREL #1 and the age of first sexual intercourse and the number of sexual partners is consistent with religious regulation of sexuality within many Christian denominations and Islam (Strassman et al., 2012). Among a group of young Muslim adults, religious activity significantly reduced the likelihood of sexual activity among female, but not male, students (Muhammad et al., 2016). The pattern in the current study suggests that organized religious activity such as religious service attendance, attending formal group studies of sacred texts, and/or participation in prayer groups may reduce high-risk sexual behavior.

The regression analyses suggest that DUREL 3, internalized, personally held spirituality, may account for much of the association between religion and marital attitudes. In their description of the DUREL Scale, Koenig, and Bussing (2010) cite Allport and Ross' definition of intrinsic religion: "Persons with this orientation find their master motive in religion. . .. Having embraced a creed, the individual endeavors to internalize it and follow it fully." (p. 80). In this way, religion exerts a strong influence on daily life. Twenge and colleagues (2016) found a significant decline in participation in religious organizations and identification with a particular faith among 18–29-year-olds. As involvement in institutionalized religion decreases, there appears to remain an inner spiritual sense that holds the principles of one's faith close. Our findings suggest that persons identifying with their intrinsic spirituality, despite withdrawing from extrinsic religiosity, retain a connection to the institution of marriage.

While the current study addresses a relatively neglected relationship between religiosity and young adults' perceptions of marriage, this investigation has some limitations. The absence of a diverse sample, while reflecting the demographics of the region where the study was conducted, may limit generalizability. Geographically, this region's population has been characterized as politically conservative. In the U.S., conservatism has been associated with extrinsic Christian religiosity, emphasizing adherence to behavioral guidelines of faith-based institutions. It is suggested that future research include a more detailed measure of religiosity and the application of a multidimensional scale of marital attitudes, as well as a larger sample size.

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Examining Junior High School Students' Personality Factors as Predictive Indices of Adolescent Digital Technology Interaction and Importance

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Abstract

Adolescents considered digital natives, have become increasingly involved in weaving together their offline and online lives before and during the pandemic. The web is an indispensable space for connecting with people and the environment. Hence, their digital use is often related to well-being and risks. Adolescent Digital Technology Interaction and Importance (ADTI) Scale took a different angle in explaining adolescents' focus on their use of digital technology. This tool is a self-report survey administered to 1,322 students from an exclusive boys' school. Along with the Adolescent Personality Questionnaire (APQ), this study aimed to explore personality factors that are correlated with adolescent digital interaction. Results analyzed using correlation and regression showed APQ Factors were significantly correlated with ADTI and its subscales. Among these factors, some were also shown to be significant predictors of ADTI. Findings imply that personality factors influence how adolescents interact with digital technology.

Keywords: adolescent, personality, digital technology, social media, well-being

Digital technology has permeated society even before the COVID-19 pandemic. People of all ages from various walks of life have become reliant on different devices to access cyberspace. According to WHO (2021), social media alone links almost half of the global population.

Adolescents considered digital natives, have become increasingly involved in the digital world, weaving their offline and online lives together. For them, the web is an indispensable space for connecting with the people around them and their environment. Likewise, the digital epoch is unfolding at an alarming rate. There is a surge in digital technology facilities, making it easier for adolescents to utilize these wherever and whenever.

In the Philippines, this behavior has become more prominent as some academic institutions shifted from traditional classroom-based learning to online or distance learning. The ubiquity of digital technology is undeniable as students rely on Internet connectivity and gadgets to accomplish tasks assigned to them in school. Examples of these are searching for data online for presentations in class, tapping on apps that the institutions themselves require for assessments, and creating materials as outputs for their subjects. These technologies vastly reconstructed not only their education but their daily lives in general.

It is incontestable that digital technology does great good for people, especially adolescents. However, their interaction with it and how they see its value and importance also pose several risk factors to their wellness, not only because they are digital natives but because they are at a critical, precarious, and vulnerable stage in their development as individuals (Charmaraman, Sode, & Bickham, , 2020). Bistko and colleagues (2018) aptly described this stage as a time marked by a precipitous rise in the pervasiveness of issues and concerns with their mental health. Hence, with this vulnerability, their digital lifestyle, if not checked, may impair their bodily health, their performance in various activities, and their overall well-being. Moreno and colleagues (2022) noted that digital technology use may increase adolescents' positive and negative mental conditions when interacting with their online environment.

Junior High School comprises teens in their early adolescence. At this stage, students are changing in all domains that most adolescents experience. Before the pandemic, although some schools had guidelines and restrictions regarding gadget use, the students use their off time from school to plug into cyberspace, usually through gaming.

Discord, a voice-over-Internet protocol (VoIP) technology developed initially for gamers to talk to each other within games, has become a favorite platform for building communities they call servers beyond gaming. Discord's ease of access and its privacy for adults who are mostly spending time on Facebook to connect with others is the primary reason it is a preferred channel for connecting online among teens. It is a sample indicator of the need of adolescents to stay connected and updated with peers and to meet new people with similar hobbies and interests away from prying adult eyes. As educational institutions shifted to online learning because of the COVID-19 pandemic, students became more immersed in technology not only out of want but because of need. They must plug in to finish tasks and complete assignments given to them as requirements in school.

Steps have been undertaken to understand the context of students better through research. It has helped in reaching out and aiding students where it is needed. However, data on the importance and interaction of students with digital technology and its relation to their personality factors is still unavailable. Personality factors are essential gauges that can provide a full picture of an individual, which can help in determining several aspects of an individual such as strengths and weaknesses (Catell & Schuerger, 2003). Though these factors often vary making each person unique from another, there are certainly some similar facets. These characteristics of personality, when studied with other factors, give glimpses of vital information for understanding humans in general. In this case, the study focuses more on adolescent personality.

As a response to this research gap, exploring students' personality factors and their relation to digital technology importance and interaction can help institutions to plan, revise, and implement programs and modules on digital technology, media, and citizenship that can support them and ease their concerns and issues where digital technology use is concerned.

Considering what is currently known about digital technology and adolescents, the current study aimed to (a) obtain a deeper understanding of the importance of digital technology in the lives of adolescents, and (b) develop an awareness of the relationship of digital interaction with adolescents' personality factors.

Scope and Limitation

This study is not without its limitations. One major limitation that is evident is its generalizability. Results cannot be generalized to the adolescent population for two (2) reasons: a) the lack of gender diversity and b) the adolescent boys included in the study are coming from the National Capital Region (NCR) from a Catholic, private institution for junior high school boys. Demographics collected did not include gender preference during data collection. Moreover, while students from various parts of the Philippines are admitted, the majority of those who decide to enroll would often be those who passed the application process, who are willing to relocate near the campus after being accepted, or those who have ease of access when going to school.

Another limitation of the study is the lack of multiplicity in terms of socio-economic status. Though the school is open to all students and 20% of the student population comprises academic scholars and financial aid grantees, most of them can still be classified as belonging to the middle to upper class, which also brings us another constraint.

The school is a private institution. The tool used to measure personality factors to explore digital technology interaction and importance is a standardized measure that entails purchasing and securing permission to use. Data privacy, schedules, and other logistic concerns were also taken into consideration, which limited the scope to the junior high school unit.

Methodology

The study utilized a descriptive-correlation research design to evaluate the concepts of adolescent digital technology interaction and its importance and its relationship with adolescent personality factors. The University Research Ethics Committee (UREC) of the University approved conducting the study on November 26, 2021. The survey was done in December 2021.

Setting and Participants

The goal of the research team was to cover three (3) grade levels from a Catholic private institution for junior high school boys in the Philippines. Informed Consent Forms were secured from parents/guardians. Students who were permitted to join signed Informed Assent Forms. Orientation for the study conducted was scheduled to discuss with the respondents the research and to give them ample time and an avenue to ask questions and clarify before actual test administration.

To be eligible for the study, the respondent must be officially enrolled as a Junior High School student aged 12-17 years old and must have taken the Adolescent Personality Questionnaire (APQ) upon approval of the UREC.

Measures

Adolescent Personality Questionnaire (APQ)

The APQ is a self-report, multi-level instrument that was designed to measure the personality constructs of adolescents. Information gathered can be used as a screening tool and as a guide for professionals in presenting life topics that may be difficult for adolescents to discuss. The distinct levels of the tool are integrated to offer an in-depth appraisal, and projection of the behavior of the individual completing the test (Cattell & Mead, 2008).

Adolescent Digital Interaction and Importance (ADTI)

The ADTI Scale is a psychometrically validated instrument designed to assess adolescents' digital technology interactions and their perception of its importance. It is composed of 18 items that evaluate three (3) factors: (a) Technology to bridge online/offline experiences, which assesses how adolescents share offline content about themselves online, and investigate offline people, businesses, or events, using online tools; (b) Technology to go outside one's identity or offline environment, which assesses ways for technology to assist an individual in going beyond their current identity, mood, or offline environment, and (c) Technology for social connection, which assesses ways adolescents use technology to relate, interact, or converse with others. Cronbach alpha values for the three (3) factors are 0.87 (factor 1), 0.90 (factor 2), and 0.82 (factor 3). All factors had $\alpha > 0.80$, signifying excellent internal consistency (Moreno, Binger, Zhao, & Eickhoff, 2020).

Demographic Variables

The demographics considered for the study included age and grade level. Gender was not considered because the gender preference of the students was not included during data collection. The research setting is an exclusive boys' school.

Data Analysis

Statistical methods used included percentage (%), which translated the frequencies and shared variances of the data. Descriptive Statistics (Mean and Standard Deviation) were employed to analyze the mean scores and dispersion of the data obtained from the respondents. Averaging of the raw scores was done to give an estimate of the value of the score used in determining the level of importance and interaction with technology. Pearson r was employed to determine whether the independent variable of the study, digital interaction, and importance significantly correlate with 16 primary scales that measure adolescent personality, namely warmth, liveliness, vigilance, openness to change, reasoning, rule-consciousness, abstractedness, self-reliance, emotional stability, social boldness, privateness, perfectionism, dominance, sensitivity, apprehension, and tension. Along with these, three (3) factors that measured how adolescents take on life's difficulties (discouragement, problems with authority, worry) were also computed. The interpretation of the data was determined at a .05 level of significance. All analyses were done using IBM Statistical Package for Social Sciences (IBM SPSS) version 28.

Results

Out of the 1, 591 students from Grade 8 to Grade 10 in a Catholic private school for junior high school boys in the Philippines, 1,322 students participated in the study. This sample comprises 83% of the target population. The frequencies and percentages for each grade level and age group are shown in Table 1 and Table 2, respectively.

Table 1
Frequency and Percentage of Respondents by Grade

Grade	n	%
10	420	31.8
9	445	33.7
8	457	34.6
Total	1322	100.0

Note: N=1322

As illustrated in Table 2, 31.8% of the student respondents are Grade 10 students, 33.7% were Grade 9 students, and 34.6% were Grade 8 students.

Table 2

Frequency and Percentage of Respondents by Age

Grade	n	%
12	4	.3
13	335	25.3
14	467	35.3
15	433	32.8
16	81	6.1
17	2	.2
Total	1322	100.0

Note: N=1322

Table 2 shows the frequency and percentages of the respondents by age. As indicated, 35.3% (n= 467) age 14 years old, 32.8% (n=-433) are 15 years old, 25.3% (n=335) are 13 years old, 6.1% (n=81) are 16 years old, .3% (n=4) are 12 years old, and .2% (n=2) are 17 years old.

Table 3

Means, Standard Deviation, and Correlation between Adolescent Digital Technology Interaction and Importance and Adolescent Personality Factors

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. ADTI Overall	2.94	.796	1																						
2. ADTI Factor 1	3.05	.942	.789**	1																					
3. ADTI Factor 2	2.34	.884	.774**	.610**	1																				
4. ADTI Factor 3	3.63	.915	.714**	.544	.487**	1																			
5. Warmth	5.15	1.72	.089**	.106**	.077**	.073**	1																		
6. Reasoning	5.78	1.47	-.066*	-.072**	-.097**	.021	-.059*	1																	
7. Emotional Stability	4.78	1.84	-.035	-.014	-.049	-.072**	.111**	-.058*	1																
8. Dominance	4.42	1.83	.047	.057*	.025	.073**	-.013	.106**	-.074**	1															
9. Liveliness	4.72	2.07	.147**	.135**	.087**	.141**	.170**	-.009	.072**	.169**	1														
10. Rule Consciousness	6.83	1.82	-.080**	-.037	-.062*	-.075**	.268**	.056*	.194**	-.149**	-.141**	1													
11. Social Boldness	4.25	2.14	.104**	.167**	.080**	.082**	.334**	-.080**	.191**	.342**	.334**	.047	1												
12. Sensitivity	5.20	1.76	.038	.069*	.010	.039	.202**	.142**	-.050	.017	-.002	.143**	.015	1											
13. Vigilance	6.24	1.84	.013	.001	.018	.008	-.217**	-.019	-.168**	.106**	-.087**	-.209**	-.062*	-.037	1										
14. Abstracted	5.91	1.72	-.008	-.002	.005	-.041	-.094**	-.063*	-.189**	-.034	.072**	-.223**	-.061*	.016	.062*	1									
15. Privateness	6.78	1.94	-.075**	-.116**	-.036	-.053	-.323**	.055*	-.160**	-.132**	-.320**	-.041	-.454**	-.036	.271**	.051	1								
16. Apprehension	6.67	1.95	.086**	.044	.093**	.074**	-.024	.054	-.564**	-.080**	-.100**	-.152**	-.284**	.114**	.198**	.164**	.202**	1							
17. Openness to Change	4.65	1.54	.066*	.122**	.034	.054*	.312**	.018	.152**	.176**	.197**	.112**	.391**	.145**	-.065*	-.016	-.291**	-.157**	1						
18. Self-Reliance	5.72	2.29	-.008	-.014	-.004	-.005	-.365**	.065*	-.144**	-.022	-.324**	-.117**	-.282**	-.020	.269**	.030	.375**	.177**	-.193**	1					
19. Perfectionism	6.09	2.15	.043	.048	.026	.021	.275**	-.003	.168**	.085**	-.026	.422**	.167**	.110**	-.100**	-.360**	-.121*	-.181**	.222**	-.071**	1				
20. Tension	5.80	1.89	.012	.018	.009	.038	-.298**	.043	-.422**	.191**	.033	-.343**	-.149**	-.123**	.242**	.190**	.178**	.286**	-.148**	.179**	-.245**	1			
21. Discouragement	45.15	18.76	.080**	.098**	.047	.073**	.612**	-.046	.230**	.070*	.513**	.187**	.447**	.076**	-.483**	-.233**	-.683**	-.243**	.316**	-.815**	.220**	-.290**	1		
22. Problem with Authority	52.93	15.81	-.073**	-.089**	-.061*	-.047	-.544**	-.034	.174**	.294**	-.016	-.150**	.031	-.766**	.077**	-.276**	.062*	-.410**	-.136**	.111**	-.025	.134**	-.173**	1	
23. Worry	40.85	17.21	.097**	.156**	.062*	.096**	.284**	.012	.124**	.695**	.325**	-.001	.830**	.068*	-.014	-.056*	-.410**	-.247**	.657**	-.232**	.210**	-.049	.387**	.102**	1

*Note: **Correlation is significant at the 0.01 level (2-tailed).*
*Correlation is significant at the 0.05 level (2-tailed).

A Pearson correlation coefficient was computed to evaluate the linear relationship between adolescent digital technology interaction and importance (ADTI) and its three (3) factors, the 16 prime adolescent personality factors, and the three (3) factors from the life's difficulties group. Table 3 illustrates the corresponding significant relationships between the variables. The results suggest that eight (8) out of the 16 personality factors have a significant relationship with ADTI overall. Likewise, three (3) factors under the life difficulties group were all found to be significantly associated.

Warmth (r=.089, p=0.001), liveliness (r=.147, p<.001), social boldness (r=.104, p= p<.001), apprehension (r=.086, p= p<.001), and openness to change (r=.066, p=0.016) have a significant

positive relationship with ADTI overall. On the other hand, reasoning (r=-.066, p=.017), rule consciousness (r=-.080, p=.003), and privateness (r=-.075, p=006) have an inverse or a negative relationship with ADTI overall. Discouragement (r=.080, p=.004) and Worry (r=.097, p<.001) have a significant positive association with ADTI overall, whereas Problem with Authority (r=-.073, p=.008) has a significant inverse or negative association with ADTI overall.

For ADTI Factor 1, Warmth (r= .106**, p<.000), liveliness(r=.135 , p<.000), social boldness (r=.167 , p<.000), sensitivity(r=.063 , p=.012), and openness to change(r=.066 , p=.016) are seen to have a positive correlation while reasoning (r= -.072, p=.009) and privateness (r=-.116, p<.000) are shown to have a negative correlation. Life's difficulties factor discouragement (r=.098, p<.000) and worry (r=.156, p=<.000) also have a positive relationship while the problem with authority (r=-.089, p=.001) has a negative relationship.

Warmth (r=.077, p=.005), liveliness (r=.087, p=.002), social boldness (r=.080, p=.003), and apprehension (r=.093, p=.001) are the factors that showed a significant positive relationship with ADTI Factor 2. Reasoning (r-.097, p<.000) and rule consciousness (r=-.062, p=.024) are indicated to have a negative relationship. Worry (r=.062, p=.024) from life's difficulties also has a positive relationship while the problem with authority (r=.061, p=.026) has a negative relationship.

ADTI Factor 3 shows a positive correlation with warmth (r=.073, p=.008), dominance (r=.073, p=.008), liveliness (r= .141, p<.000), social boldness (r=.082, p=.003), apprehension (r= .074, p=.007), and openness to change (r=.054, p=.048). Emotional stability (r=-.072, p=.009) and rule consciousness (r=-.075, p=.006) show a negative correlation. Discouragement (r=.073, p=.008) and worry (r=.096, p<.000), factors of life's difficulties, indicate a positive relationship with ADTI Factor 3 as well.

It must be noted that a significant positive relationship means that as personality factors increase or decrease, ADTI overall and its factors follow. Likewise, a significant inverse relationship means that as personality factors increase, ADTI overall and its factors decrease, or as personality factors decrease, ADTI overall and its factors increase.

Table 4

Regression Coefficients for Predicting Adolescent Digital Technology Interaction and Importance (Overall)

Variable	B	SE	95% CI		β	p
			LL	UL		
(Constant)	2.646	.306	2.046	3.246		.000
Warmth	.035	.021	-.006	.076	.076	.092
Reasoning	-.032	.015	-.061	-.002	-.058	.035
Liveliness	.049	.013	.023	.075	.128	.000
Rule Consciousness	-.026	.013	-.052	-.001	-.060	.045
Social Boldness	.025	.021	-.017	.067	.067	.244
Privateness	-.014	.016	-.046	.018	-.034	.392
Apprehension	.044	.014	.018	.071	.109	.001
Openness to Change	.013	.022	-.030	.056	.025	.548
Discouragement	-.002	.002	-.007	.002	-.058	.274
Problem with Authority	.000	.002	-.004	.004	-.003	.949
Worry	-.000	.003	-.006	.006	-.002	.976

Note: R^2 adj=0.042 (n=1321, p<0.000); Confidence interval for B

Multiple linear regression was calculated to predict ADTI overall on significantly correlated personality factors and life's difficulties factors. The overall regression was statistically significant ($R2$=.050, F (11, 1310) = 6.270, p<.000). It was found that liveliness (β=.128, p<.000) and apprehension (β=.109, p=.001) are significant positive predictors of ADTI overall. Reasoning (β=--.058, p=.035) and rule consciousness (β=-0.60, p=.045) are shown to be significant negative predictors. This finding is indicated in Table 4.

Table 5

Regression Coefficients for Predicting Adolescent Digital Technology Interaction and Importance (Factor 1)

Variable	B	SE	95% CI		β	p
			LL	UL		
(Constant)	2.923	.555	1.834	4.012		.000
Warmth	.005	.030	-.054	.064	.009	.864
Reasoning	-.044	.018	-.078	-.009	-.069	.013
Dominance	.161	.096	-.028	.349	.313	.094
Liveliness	.048	.015	.018	.079	.107	.002
Social Boldness	.194	.097	.004	.384	.443	.045
Sensitivity	-.007	.031	-.067	.053	-.013	.821
Privateness	-.031	.019	-.069	.006	-.065	.100
Openness to Change	.172	.095	-.014	.358	.281	.070
Discouragement	-.005	.003	-.010	.001	-.093	.090
Problem with Authority	-.007	.004	-.015	.002	-.110	.134
Worry	-.034	.022	-.078	.010	-.630	.125

Note: R^2 adj=0.055 (n=1321, p<0.000); Confidence interval for B

Similarly, multiple linear regression was utilized to predict ADTI Factor 1 on personality and life's difficulties factors that were shown to have a significant relationship.

A statistically significant overall regression was found (R2=.055, F (11, 1310) = 6.979, p<.000). Among the factors, findings suggest that liveliness (β=.107, p=.002) and social boldness (β=.443, p=.045) are positive predictors of ADTI Factor 1, while reasoning (β=-.069, p=013) is a negative predictor as indicated in Table 5.

Table 6

Regression Coefficients for Predicting Adolescent Digital Technology Interaction and Importance (Factor 2)

Variable	B	SE	95% CI		β	p
			LL	UL		
(Constant)	2.027	.289	1.459	2.595		.000
Warmth	.030	.019	-.008	.068	.059	.118
Reasoning	-.054	.017	-.087	-.022	-.091	.001
Liveliness	.025	.013	.000	.050	.059	.047
Rules Consciousness	-.023	.014	-.051	.004	-.048	.100
Social Boldness	.031	.021	-.010	.072	.076	.136
Apprehension	.055	.015	.026	.084	.122	.000
Problem with Authority	.001	.002	-.004	.005	.010	.802
Worry	.000	.003	-.005	.005	-.007	.891

Note: R^2 adj=0.032 (n=1321, p=0.000); Confidence interval for B

Table 6 illustrates the significant predictors for ADTI Factor 2. Using multiple linear regression, overall results were found to be statistically significant (R2=.036, F (8, 1313) = 6.456 p<.000). Three (3) factors were observed to be significant, namely reasoning (β=-.091, p=.001) being a significant negative predictor while liveliness (β=.059, p=.047) and apprehension (β=.122, p<000) are significant positive predictors for ADTI Factor 2.

Table 7

Regression Coefficients for Predicting Adolescent Digital Technology Interaction and Importance (Factor 3)

Variable	B	SE	95% CI		β	p
			LL	UL		
(Constant)	3.187	.391	2.420	3.953		.000
Warmth	.035	.020	-.004	.073	.066	.078
Emotional Stability	-.022	.017	-.054	.011	-.044	.194
Dominance	-.001	.093	-.185	.182	-.003	.987
Liveliness	.052	.015	.023	.082	.119	.000
Rule Consciousness	-.027	.015	-.056	.003	-.053	.074
Social Boldness	-.000	.095	-.186	.186	.000	.999
Apprehension	.031	.016	.000	.063	.067	.053
Openness to Change	-.007	.093	-.189	.175	-.011	.943
Discouragement	-.001	.002	-.005	.003	-.018	.678
Worry	.004	.391	-.039	.047	.077	.852

Note: R^2 adj=0.032 (n=1321, p=0.000); Confidence interval for B

As specified in Table 7, employing multiple linear regression, overall findings show it to be statistically significant (R2=.039, F (10, 1311) = 5.318 p<.000). However, among the variables included in the model, only liveliness (β=.119, p<.000) was a significant positive predictor for ADTI Factor 3.

Discussion

To understand what variable may have a significant relationship with ADTI and its factors, the researchers considered the 16 personality factors as measured by APQ along with life's difficulties factors as probable determinants. It was found out that several factors were found to have significant relationships and they were also noted to be good predictors. In the study of Moreno and colleagues (2022), they found ADTI to be significantly related to positive and negative aspects of mental health. Similarly, this study shows how personality factors would often exhibit different aspects of individuals depending on their manners, relations, and habits. Correlations and predictions are established to explain how adolescents perceive their interactions and the importance they place on digital technology.

ADTI and its Correlation with Personality Factors

Warmth, when high, indicates a person who is seen to be outgoing, person-oriented, and socially attentive. In general, they are more open with their emotions, they like taking care of people's needs, they enjoy listening and knowing about people's feelings, and talk to them about their personal feelings and experiences. It was significantly correlated with overall ADTI and all its factors. This may mean that digital technology is a way for adolescents to make friends and interact with people, keep abreast with people they intimately know, or deepen relations with acquaintances. They may see cyberspace as an extension of their real-life

situation and see it as important if not more than their offline life. Digital technology gives affordances of real-time interaction with people from different locations that traditional catching up cannot provide. Students low on warmth may be unable to perceive the importance of interaction through technology because personality-wise they prefer not to interact with other people beyond what they see as significant conversation, or they prefer to stay in touch with people in their close or small group without the use of digital technology.

Reasoning is a brief measure of general cognitive ability useful in gauging an individual's capacity in solving problems in general and can be employed as an explanation for how well a student can perform in an academic setting. This factor was found to be negatively related to ADTI overall and all its factors. Considering this, students who perceive interaction with technology as an integral part of their daily living may impact their ability to handle and find solutions to practical and real-life situations. Moreover, cognitive ability may become more impaired when adolescents are heavily reliant on digital technology for producing practical and novel approaches to life problems such as performing well in school and accomplishing tasks related to it. It is important to note that perception or the subjectivity of the experience and the importance of digital technology rather than the individual's objective involvement may have a greater influence over cognitive ability.

Emotional Stability is the way adolescents manage problems, how quick they are to recover from emotional upset, and general satisfaction with life, among others. Students who score high in this facet are described to be calm in emergencies, emotionally resilient, and have a mature approach to life. Low scores are associated with anxiety, some medical problems, and a tendency to overreact to stress. This factor was found to be negatively associated with ADTI Factor 3 or Technology for Social Connections. Adolescents whose perceived importance in relating, interacting, and conversing with others through digital technology is high are likely to give way to pressure and are more vulnerable to upsetting situations, making it difficult for them to recover. In contrast, adolescents who put less premium on immersing themselves in digital technology to connect with others are seen to be more well-rounded and grounded, and less affected by unfavorable circumstances.

Dominance refers to the ability of an adolescent to be in charge, to want to have their way, to be outspoken, and to have a high need for others to accept their ideas and insights. Students who score low on this facet are happy to let other people take charge. This factor is found to have a positive association with ADTI Factor 1 and Factor 3. Adolescents whose propensity to have their way and make people give credence to their ideas have a higher tendency to immerse themselves in digital technology as an instrument to make people see and convince them of their point of view or perspective. Further, it is their avenue to either communicate with like-minded people or have conversations with others whose standpoints differ from theirs. Adolescents who are satisfied with letting other people lead may be unable to see the need to engage with people online.

Liveliness pertains to the level of energy an adolescent has. High scorers tend to be high-spirited, enthusiastic, and uninhibited in their approach to life and are often described to be the

life of the party. They often exhibit a style that can be described as fast paced and quick. Often, the energy they have can be focused on or directed at social interactions. Low scorers have a higher propensity to be cautious and serious in life. They tend to be steadier and more consistent, and because they are careful and diligent, they have a higher proclivity to foresee challenges and avoid dangers. This facet is positively associated with ADTI overall and all its factors. Students high on this factor may see digital technology as an integral part of their life. They have higher enthusiasm to share their offline life in their online life and tend to explore various social media platforms where they can best engage and share their life experiences. They also see digital technology as a way of expressing an exaggeration of their mood states. Students low on this facet may only use digital technology as they see the need. Their sense of danger may propel them to avoid the overuse of digital technology because they may find it to be risky to engage too much with it.

Rule-Consciousness relates to an individual's attribution of rules of behavior that society determines. High scorers for this facet tend to consider their actions whether it is proper. They are firm believers that rules are rules and must be followed and that individuals ought to strictly follow moral standards. Low scorers view rules as flexible and can be breached if necessary. They prefer to believe that doing what one wants is more valuable as opposed to rigorously adhering to rules set by the public. This factor was found to be negatively correlated with ADTI overall and factors 2 and 3. This proposes that students who conform to and obey societal standards are less likely to immerse themselves in digital technology. Moreover, as students practice self-discipline, their propensity to regulate digital technology use becomes better. Alternatively, students who have fewer qualms about breaking rules and relish doing what they want may find themselves more engaged in digital technology as they see it to be less restricted and offers more freedom to involve themselves in a less constraining environment.

Social Boldness describes how an individual interacts with other people at an individual or group level. Those who score high on this factor describe ease in engaging in conversation with others, even new acquaintances, as well as having feelings of fitting in immediately after connecting with others. Contrariwise, those with low scores feel awkward initiating and participating in conversations. They become embarrassed easily especially if they find themselves have become the focus of attention. This construct was found to be positively associated with ADTI overall and all its factors. Students who are socially bold, attention-seekers, and adventurous may find digital technology to be integral to having a richer social and personal life. They also have a higher inclination to explore its various dimensions, making them interact with it profoundly. Those who are socially awkward, timid, and sensitive to criticism may find digital technology less enticing to engage in and negligible to leading a better social and personal life.

Sensitivity is often associated with sentimentality, emotional sensitivity, and a sense of aesthetics. A high score in this facet would see an individual who is artistic, appreciative of the arts, imaginative, and has a deep understanding of feelings of oneself and of others, which is often conveyed as empathy. A person with a low score, on the other hand, is less emotional, more attuned to objective information, and more rational. They tend to be in sync with the

physical and functional dimensions of their surroundings and would often be described to be logical in terms of decision-making. ADTI factor 1 was positively associated with this factor. Those who are sensitive to the needs of others or those who show concern or compassion to others are more likely to engage with digital technology because they see it as a valuable tool for their advocacies. Digital technology also offers them possibilities for exploring their inclination for the arts. Less emotional individuals are likely to have minimal interaction with digital technology and would utilize them for its basic function such as gathering information rather than keeping them to stay connected with people.

Privateness refers to how an individual reveals an aspect of oneself to others. High scorers tend to keep problems to themselves, find it difficult to divulge information or speak about matters they consider to be personal, refuse to reveal their personal feelings about certain matters, and are seen as guarded, making people have an impression that it is quite difficult to become close to them. Keeping a social mask (Catell, 1989) is a deliberate effort they make to evoke certain responses from the people around them. For some, it is an entrenched reaction to keep matters about themselves private. Low scorers are more forthright, unfiltered, and quick to disclose concerns about themselves. They are candid even with issues that others may see as too private and have minimal internal censorship (Catell, 1989). ADTI overall and factor 1 negatively correlate with this factor. This implies that those who have a higher propensity to avoid sharing and revealing their personal lives are unlikely to become intensely involved with digital technology, thereby, making it a less significant presence in their lives. Those whose scores are low on this facet may see digital technology as a place to mesh their penchant for sharing everything with others.

Apprehension is a scale that may be ascribed to Worry, which is a factor that is part of the life's difficulties item subset. However, for this factor, high scorers are seen to be prone to a sense of personal insecurity and more susceptible to guilt, fear, loneliness, and self-doubt. It is possible to attribute self-esteem issues as a primary component of those who score high here. Low scorers worry less compared to most people, are unaffected by other people's impressions, and are unlikely to reconsider decisions made when they have made up their minds. This scale was found to be positively correlated to ADTI overall and factors 2 and 3. Students who have problems with how they view themselves may seek to redefine themselves using digital technology and are likely to put value in engaging in them. Likewise, interaction with people through digital technology may be useful in assuaging self-doubt, loneliness, fear, and guilt. Moreover, individuals scoring high on this facet may also be predisposed to constantly monitor and check social media platforms for people's opinions of them and would be thinking of ways to prevent content or situations from becoming unpleasant while engaged in digital technology.

Openness to Change pertains to the individual's propensity for innovation and going beyond the conventional. Those who score high here often report wanting to be pioneering or inventive in taking on things as opposed to continually following tried and tested approaches. Experimenting is something that they thrive on. They are also found to persistently update themselves on social problems. Those who score low are more confident when they stick with

the familiar. They prefer routines and can be resistant to change. The status quo is a preferred way of approaching things, and they feel that questioning and changing well-established methods will only bring about unnecessary problems. This factor is positively associated with ADTI overall and factors 1 and 3. Progressive, open-minded, and experimenting students have a higher likelihood of seeing the importance of engaging with digital technology. It is their means of keeping up with the changing times and their steady companion in bringing about change and innovation where they see the need. The convenience of easily reaching out to social connections that are also integral to their goals is also something that makes them constantly engaged with digital technology. It is one of the epitomes of what innovation and experimentation can do for people.

Discouragement is a factor that, when elevated, reflects cynicism and alienation. Some aspects of this facet tap into signs of depression and suicidal ideations but may not be used for diagnosing clinical depression. Rather, this factor helps in identifying adolescents that may have a high propensity to experience depressive symptoms for monitoring and counseling. It is positively associated with ADTI overall and factors 1 and 3. Parallel to the study by Moreno and colleagues (2022), ADTI scores can be associated with depression. The feelings of emptiness, isolation, and negativity allow adolescents to draw on digital technology as a means for alleviation of these feelings. They see it as a valuable means of sharing themselves online, finding people who are like their circumstances, and socially connecting with them.

Problems with Authority comprises reports on adolescents engaging in less serious forms of prohibited actions such as getting called in for school violations. This factor is negatively correlated with ADTI overall and factors 1 and 2. This suggests that students who have a high probability of getting into trouble with authority are unlikely to engage in digital technology, especially in bringing their offline life online, to avoid the risk of exposure to altercations with authority figures.

Worry is a factor that measures adolescents' more serious concerns. Items found under this construct would reflect more intense feelings of anxiety. It was found to be positively correlated with ADTI overall and its factors. Students with elevated scores here may seek ways in which they can lessen feelings of anxiety. Digital technology may be an accessible and multifaceted tool that can provide answers to questions often asked by overly anxious adolescents such as experiences of sudden illness and feelings of unexplained fears. It also allows for an opportunity to voice out their concerns and socially connect with people, new and old.

ADTI and Personality Factors as Predictive Indices

This study is the first to examine personality factors as predictors of digital technology interaction and its importance among adolescent boys. Findings yielded several factors that account for how junior high school boys view, consume, interact, and see the importance of digital technology. From the sixteen (16) personality factors that were computed along with three (3) additional factors that measure how they take on life's difficulties, five (5) factors were found to be significant predictors.

Reasoning is a significant negative predictor of digital technology's importance and interaction among adolescents. This implies that the more engaged adolescents are with digital technology and the more they place importance on it impairs their ability to do cognitive tasks (e.g., academic performance, problem-solving). Further, cognitive capacity or their ability to think for themselves diminishes as they become dependent on technology to do their "thinking" for them. Studies (e.g., Mustafaoglu et al., 2018) do point out time, frequency, and contents as possible culprits for the negative effects of digital use. However, as explained by Moreno and colleagues (2020) when they developed ADTI, more than these, the importance they place and the "how" in terms of consumption is something that needs to be investigated. Based on the findings, the more importance they place on digital technology and the quality of the interactions they have with it impacts their cognitive abilities.

Liveliness is also a significant positive predictor. Most adolescents are at an age where they have boundless energy, a consequence of their development. Digital technology is a gateway for adolescents to channel their energy to enmesh their offline and online lives. This has become more apparent during the peak of the COVID-19 pandemic when adolescents easily transitioned to online learning. Though it is still fraught with challenges, the situation where digital technology is concerned was tolerable and problems were more on the technical side rather than the interaction with it. Additionally, when school was at a halt, the importance of digital technology was emphasized as they spent most if not all their time immersed in it to pass the time and alleviate the restlessness brought about by the uncertainty of the situation.

Rule consciousness negatively predicts digital technology interaction and importance. As students develop self-discipline and regard for societal rules and standards, their awareness of balance and regulation with how they consume digital technology also grows. The affordances of freedom and loose restrictions that digital technology provides are more enticing for adolescents who can think of rules as bendable when needed and those who value doing what they want than being constrained by mandates and statutes. Hence, they find themselves more engaged and invested in it, making it an indispensable part of their life.

Apprehension is also a factor that positively predicts digital technology interaction and importance. Proneness to personal insecurity, self-esteem concerns, self-doubt, guilt, fear, and loneliness among others explain this factor determines the vulnerability of adolescents to immerse themselves in digital technology. They find it to be an opportunity to recontextualize the part of themselves that causes them to experience these. Digital technology also provides a means for their social connections to stay in touch and to be constantly connected. Social connections are essential in aiding adolescents to alleviate these uncomfortable feelings. This need stems from the developmental need of adolescents to belong and be accepted.

Social boldness is also a positive predictor. However, it only significantly predicted ADTI factor 1. Adolescents who are attention-seekers, adventurous, and socially adept find more reason to engage in digital technology because they can employ it for the exploration of their hobbies, for establishing new relationships, and for expanding their world by bringing in their offline life online.

In summary, studying personality factors as variables for digital technology interaction and importance gives a remarkable preview into what makes adolescents perceive digital technology as an integral part of their lives and what compels them to immerse themselves in it. What can be considered the novelty of this study is its focus on the stable traits of adolescents and how these can predict the way they employ the technologies presented to them. Likewise, this study provided an opportunity for future researchers to delve more into these factors and see how else they impact adolescent digital technology interaction and its importance.

Recommendations

To be more specific, the following are recommendations that the researchers have based on the findings generated:

a. Students may be given training on personality development and enhancement and be informed of personality factors and digital technology consumption and their effects on mental health.
b. Although the researchers acknowledge the importance of technology in the day-to-day lives of the students, a modification of the guidance module on cyber wellness can be investigated to further address the current needs of the students.
c. School administrators, faculty, and other stakeholders may consider the findings of the study in reviewing current curricula, programs, and policies where digital technology consumption is concerned.
d. Strengthening the home and school partnership by engaging parents in information seminars relating to mediating effects of technological consumption and updates on other digital technology research-based studies.

The following are also recommended for future research endeavors:

a. Conduct a similar study on older adolescents, specifically senior high school students to address the limitation of the study in terms of lack of diversity relating to gender and other demographic variables.
b. Conduct a comparative study on the students' behavior towards technology of junior high school and senior high school students to determine relevant, comparable characteristics of each group.
c. Increase the diversity of the population by considering conducting the study on those belonging to the lower socioeconomic status.

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Effectiveness of Interprofessional Education Based on the Case-and Communication-Based Approach

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Abstract

Pharmacology role-playing, which follows a case and communication (C & C)-based approach, has been developed for use in medical education, and its learning effects have been reported. To cultivate team spirit among medical professionals from an early stage, we proposed developing the C & C approach for interprofessional education (IPE). Therefore, this study aimed to examine the learning effects of the C & C approach during joint classes of medical and nursing students. In December 2017, we employed the C & C approach to simulate a scenario in which drugs were explained to patients, and responses were collected from 103/115 medical (90%) and 55/60 nursing students (92%). The questionnaires used were designed to evaluate the following five items: understanding pharmacotherapy, understanding patients' feelings, learning motivation, change in learning attitudes, and understanding IPE. Open-ended questions on learning content were analyzed based on free-text responses. Each student group acknowledged the effectiveness of the approach and the importance of cooperation. In total, 80.2% of medical students and 76.3% of nursing rated "understanding of IPE" as "very effective/effective." Participants learned about the disparity in perspectives, with medical students gaining insight into nursing students' approaches to patient interactions, and nursing students acquiring an understanding of doctors' perspectives on disease and medical treatment. In conclusion, the C & C approach proved beneficial as an IPE method, raising awareness among both nursing and medical students about the significance of communication skills and patient perspectives.

Keywords: communication skills, interprofessional education, medical students, nursing students; role-playing

Pharmacotherapy is based on the correct assessment of symptoms, diagnosis, and appropriate treatment. To achieve adequate therapeutic effects, patients and their families need to understand, accept, and practice drug therapy appropriately. Therefore, medical professionals must learn to communicate with patients effectively to ensure their safety and optimal healthcare and to convey adequate knowledge about their disease and drug therapy. Patient-centered communication (PCC), including empathetic communication, confers well-described health benefits on patients (King & Hoppe, 2013; Grossman et al., 2021), and it is widely endorsed because it is necessary for quality health delivery (Epstein et al., 2015). Although pharmacy education covers a wide range of mechanisms of action and side effects of major therapeutic agents, students tend to memorize vast amounts of knowledge because they lack clinical experience (Onomura et al., 2015). Moreover, it has been pointed out that Japanese pre-graduate education lacks "behavioral attitudinal teachings," including communication skills (Tanaka & Misawa, 2000). Therefore, to successfully treat patients, students must acquire the ability to explain the pharmacological knowledge of drugs they have learned in an easy-to-understand manner.

To address this issue, Onomura and colleagues (2015) developed a "Pharmacology Role-Play" method using student-centered role play, following a case-and-communication-based approach which involves learning based on a case presented in advance and active learning through communication. In the study, medical students were provided with an opportunity to learn about the importance of communication skills and patients' perspectives, as well as the chance to increase their motivation and awareness of the importance of basic medicine. This role-play is a form of practical pharmacotherapy education in which students play the roles of patients, physicians, and residents and explain diseases and pharmacotherapy through improvising the prescription part of a medical examination. It is worth noting that this pharmacology role-playing program was initiated at the University of Miyazaki in Japan in 2010, and by 2020, it had been implemented as a common program in 20 medical schools, two dental schools, and one pharmacy school in Japan. In addition, many previous studies have reported that improvisation as a communication simulation tool enables medical communication behaviors to be practiced in a safe learning environment before their application in the hospital (Gao et al., 2021)

Meanwhile, nurses play an important role in various stages of the patient medication process and must be competent enough to fulfill this role (Sulosaari et al., 2011). However, in the current state of nursing education, it has been reported that new nurses lack adequate pharmacological knowledge (Manias & Bullock, 2002; Sulosaari et al., 2011). Furthermore, communication skills have been identified as one of the competency areas requiring nurses' medication competencies (Sulosaari et al., 2011). Thus, we considered that providing them with the opportunity to learn through joint classes with medical students would have a learning effect in clinical practice.

WHO recommends interprofessional education (IPE) as a pre-graduate preparatory education to ensure that students understand the importance of multidisciplinary healthcare and acquire an attitude to practice it. IPE aims to bring together different professionals to study and learn

from each other and work together effectively to provide safe and high-quality care to patients/clients (Reeves et al., 2016). However, even though effective IPE development and practice (Haruta et al., 2019; Komosawa et al., 2019) is underway, it is extremely limited in Japan.

We hypothesized that beyond the professional education provided by medical schools alone, IPE with nursing students might deepen their understanding of mutual expertise and patient-centered communication skills. Therefore, this study aimed to examine the learning effects of the C & C approach as an IPE for medical and nursing students.
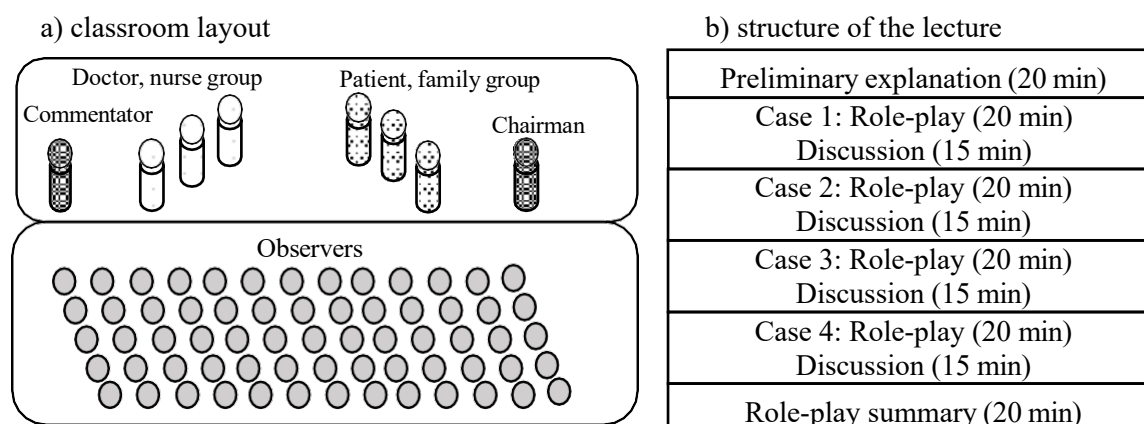
Methods

Participants

The participants were second-year medical and nursing students. Medical students follow a 6-year curriculum, whereas nursing students follow a 4-year curriculum. All patients underwent pharmacological courses. Notably, these students had no experience examining or caring for patients in clinical practice. The Ethics Committee of the University of Miyazaki School of Medicine approved the study. Informed consent, ensuring anonymity and the right to opt-out at any time, was obtained from participating students.

C & C Approach

The methods used for C & C approaches are listed in Table 1. For each of the four cases (hypertension, diabetes, manic depression, pediatric asthma, and hyperthyroidism), three doctor/nurse groups, three patient groups, one case commentator, and one chairman were selected. There was one set of eight participants, and the specific combination of medical and patient roles was determined on the day of the event and was not discussed or planned. The participants performed a role-play in front of the class using a microphone, whereas the non-performers observed them (Figure 1). At the end of the role-play, the moderator led a 15-minute session in which feedback from participants was obtained. The observers asked the role-players questions, and the commentators provided explanations.

Figure 1
Classroom Layout and Lecture Structure during the Role-Play

a) classroom layout

Doctor, nurse group   Patient, family group
Commentator   Chairman
Observers

b) structure of the lecture

Preliminary explanation (20 min)
Case 1: Role-play (20 min) Discussion (15 min)
Case 2: Role-play (20 min) Discussion (15 min)
Case 3: Role-play (20 min) Discussion (15 min)
Case 4: Role-play (20 min) Discussion (15 min)
Role-play summary (20 min)

The arrangement of the participants. The participants line up in front of the observers and the patient and health care provider groups participate in the role-play. The chairman facilitates the discussion, and the commentator provides commentary.

Table 1

Details of the Pharmacological Role-Play Method

Step	Contents	Time
1	A set will consist of six members: three in the physician group (chief physician, physician or resident, and nurse) and three in the patient group (patient and family). After inviting and deciding who would play the role of the attending physician and patient, each attending physician and patient will freely decide on the group members. Note: Details of both the doctor's group and the patient's group will remain confidential. The combination of doctor and patient groups will be decided on the day of the performance and will not be discussed or planned.	Two weeks before the C & C approach, we gave all students the cases and asked them to do some preliminary study. Roles were recruited and decided for each case.
2	The doctor group will prepare a case study distributed in advance. The theme of the case study was four different cases: (a) hypertension and diabetes, (b) manic depression, (c) pediatric asthma, and (d) hyperthyroidism.	
3	Each role-play will last for 20 min. The physician group will not have any materials at hand but will be allowed to use the slides to provide clear explanations. Note: A doctor's coat must be worn.	Performance day One set 20 min
4	Participants will perform the role-play in front of the classroom using a microphone while others observe.	One set
5	At the end of the role-play, a 15-min discussion will be led by the moderator, with comments from the participants, questions from the observers to the role-players, and commentary by the commentators.	15 min
6	Four cases will be prepared, and each will be conducted once (six participants per case, four sets conducted, 24 participants in total). Steps 4–6 are repeated for each case.	
7	Finally, a questionnaire will be administered to all participants; the four questions will be rated on a Likert scale of 1–5, and the results will be analyzed using descriptive statistics. The questions are as follows: Did it help you to understand pharmacotherapy? Did it help you to understand the patient's emotions? Did it help you to improve your awareness and motivation as a doctor or nurse? Did it have a positive impact on your learning attitude? Did it help you to understand IPE? In addition, open-ended questions will be allowed, and feedback on the role-play will be collected. There will be a vote for the best performance for each role (doctor, nurse, patient, moderator, and commentator) and the best question from the observers.	

Data Collection and Analysis

This study included 175 participants and was conducted in 2017. None of the participants opted out of the study. Sixteen medical students and 16 nursing students self-selected and performed their assigned roles. The other students served as observers. The participants were requested to complete a questionnaire containing the following two sections: 1) learning effect of the C & C approach, comprising (a) understanding pharmacotherapy, (b) understanding the patient's feelings, (c) learning motivation, (d) change in learning attitudes, and (e) understanding IPE. Each item was rated on a five- point Likert scale. 2) Change in learning attitude, which consisted of five questions, namely: patient's perspective, communication skills, amount of study, study quality, and presentation skills (multiple responses). Quantitative data were analyzed using descriptive statistics. Afterward, participants were asked to respond to open-ended questions about their impressions of the C & C approach and followed by text analysis using KH Coder – a software designed for quantitative text analysis (Higuchi, 2017). This software automatically extracts data from qualitative text data (morphological analysis). In addition, co-occurrence network analysis was performed to visually capture the types of relationships used. The extracted words with more frequent occurrences are indicated by larger circles, which are shown in the bubble plot. We decided to focus on groups of extracted words that were strongly connected to each other and named their categories from the perspective of the learning effect of the C & C approach.

Results

Effectiveness of Learning via the C & C Approach

In total, 103/115 (90%) medical and 55/60 (92%) nursing students completed the questionnaire. A comparison of the learning effectiveness of the C & C approach between medical and nursing students is shown in Figure 2. For "understanding of drugs treatment," 62.4% of medical students and 49.1% of nursing students answered, "very effective." For "understanding of patients' feelings," 51.5% of medical students and 60.0% of nursing students answered, "very effective." A higher number of medical students rated "understanding of medical treatment" as "very effective," whereas a higher number of nursing students rated "understanding of patients' feelings" as "very effective." The percentage of medical and nursing students who answered "very effective" for different categories are as follows: "Learning motivation" – medical students (52.5%) and nursing students (54.5%); "Change in learning attitude" – medical students (40.6%) and nursing students (41.8%). Notably, there were no significant differences in these parameters between groups, and the combined rating of "very effective" and "effective" in both groups was over 90%, indicating that the students considered the C & C approach to be an effective learning opportunity. However, for "understanding of IPE," 37.6% of medical students and 32.7% of nursing students answered, "very effective." The percentages of "very effective/effective" responses were 80.2% among medical students and 76.3% among nursing students. Thus, medical students found "understanding of IPE" to be slightly more effective than nursing students.
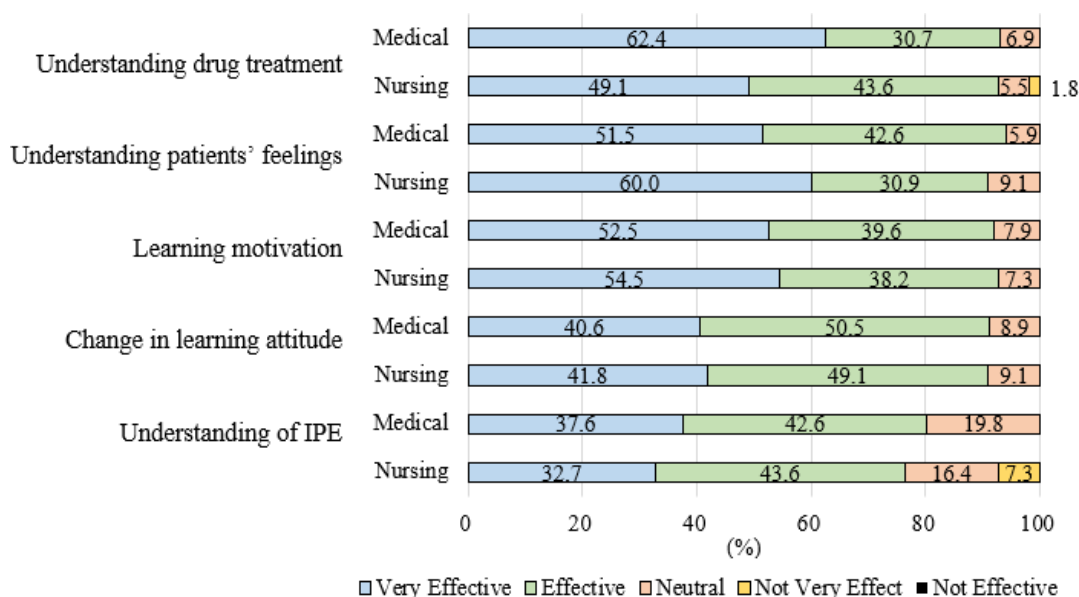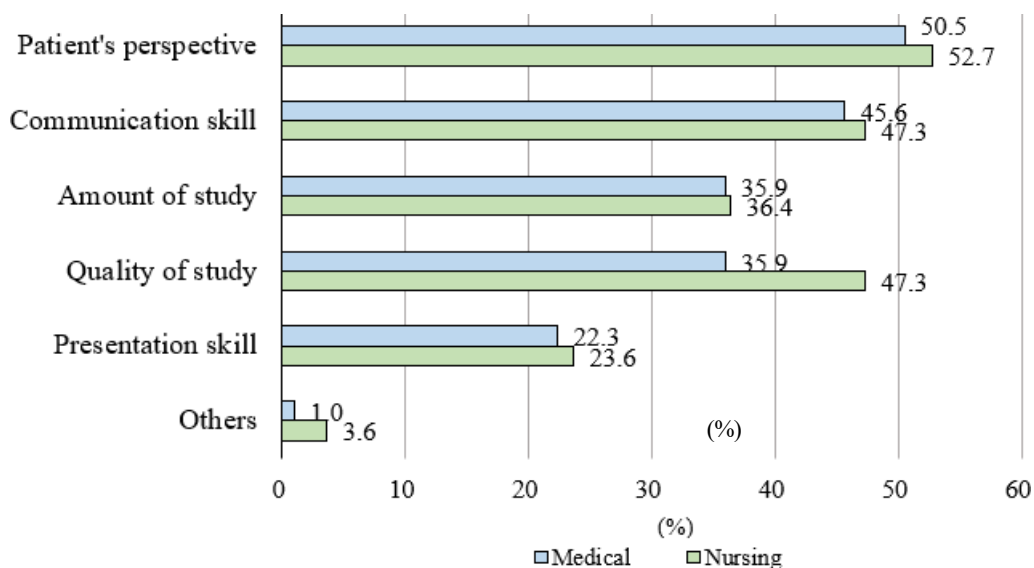
Figure 2

Learning Effect of the C & C Approach

Figure 3

Change in Learning Attitude

Changes in Learning Attitude

Regarding the changes in learning attitude (Figure 3), 50.5% of medical students and 52.7% of nursing students answered that understanding of "patient's perspective" was required, whereas 45.6% of medical students and 47.3% of nursing students selected "communication skills." Overall, half of the students answered that they needed to study each. There was no significant difference between the groups in the "amount of study" and "presentation skills." However, a higher number of nursing students (47.3%) compared to medical students (35.9 %) selected "quality of study."

Analysis of Free-text Evaluations of the C & C Approach

Using KH Coder 10, the open-ended questions were analyzed. From the diagram created using the co-occurrence network analysis, groups of words that were strongly connected to each other were selected. Five categories were extracted for medical students (Table 2), and six categories were extracted for nursing students (Table 3). We checked how the words extracted from each group were used in the context of the students' texts and assigned category names. The medical students indicated five categories: "the importance of communication, including communication with family members," "the importance of choosing words to promote understanding of technical terms," "the need to study pharmacology arising from the difficulty in explaining drugs to patients," "motivation to become a doctor," and "nursing students' perspectives on dealing with patients." The nursing students indicated six categories: "Communication skills for choosing the right words and responding accurately to patients' questions," "The importance of observing the anxiety of patients and their families while providing an explanation," "Presentation skills to understand the patient's feelings and provide easy-to-understand explanations," "Necessity of understanding the adverse effects of medications," "Questions can be learned by imagining clinical situations," and "Doctors' thoughts/explanations from the perspective of illness and medical care." For medical students, the category of "nursing students' perspectives on dealing with patients" was extracted, and for nursing students, the category of "doctors' thoughts and explanations from the perspective of illness and medical care" was extracted. The extracted text indicated what students learned about the different perspectives of individuals in each other's professions.

Table 2

Medical Students' Perceptions of the C & C Approach

Medical Students		
Item	**Category name**	**Participant comments**
Communication skills	"The importance of communication, including communication with family members"	When communicating with a patient, it is important that doctors listen to the patient's opinion rather than offering a one-sided explanation; however, I learned the importance of choosing the right words.
		It is difficult for doctors to explain to others what they are doing, and it is necessary to break down technical terms into understandable terms for patients.
		I believe it is important to enhance my communication skills in order to build a relationship of trust.
Patient's perspective	"The importance of choosing words to promote a better understanding of technical terms"	I had been thinking only about how I would interact with patients from the viewpoint of a doctor; this role-play gave me an opportunity to think from the perspective of a patient.

		As an observer, I was looking at it from the patient's point of view; I felt the importance of word choice more than I thought. Although I had prepared for it, there were times when I needed to change the way I said things, and I thought I would be more careful before the practical training because of the risk of hurting someone with a casual comment.
Learning attitude and motivation	"The need to study pharmacology arising from the difficulty in explaining drugs to patients" "Motivation to become a doctor"	I was motivated to study more about medicine and be able to talk about medicine with doctors working in the field. I was able to realize that what we were learning was at a level that could be applied clinically, and this motivated me. I realized once again that it is difficult to explain diseases and medicines in an easy-to-understand and accurate manner. I realized that to consider the patient's emotions, it is first necessary to have a solid foundation of medical knowledge.
Understanding for IPE	"Nursing students' perspectives on dealing with patients"	The joint role-play with nursing students was a good opportunity for me to learn about care and word choice from a different perspective other than that of doctors. I understand that it is important for doctors, nurses, and pharmacists to work together. The nursing student's point of view was excellent. The way she spoke was not clerical, and I felt at ease.

Table 3

Nursing Students' Perceptions of the C & C Approach

Medical Students		
Item	**Category name**	**Participant comments**
Communication skills	"Communication skills for choosing the right words and responding accurately to patients' questions"	Patients' personalities are diverse, and diverse communication skills are required. I felt again that it is important to have both communication skills and presentation skills to convey medical knowledge to patients in a way that they can understand. When I start working in the field, I want to be careful about my language and attitude to avoid making people feel anxious about things other than their illnesses.
Patient's perspective	The importance of observing the anxiety of patients and their families while providing explanation" "Presentation skills to understand the patient's emotions and provide easy- to-understand explanations"	I think it is good to be able to read the degree of understanding and anxiety on the patient's face and proceed with the explanation accordingly. I thought that I should have a good knowledge of the disease and how to help the patients so that I can answer their questions. It is important for professionals to consider various perspectives from the standpoint of patients. Medical professionals need to provide an appropriate amount of accurate information to patients and their families. However, to do so, it is important to always keep in mind what kind of information the patient's family needs from the patient's point of view.
Learning attitude and motivation	"Necessity of understanding the side effects of medications" "Questions can be learned by imagining clinical situations"	I was a commentator this time, and I was able to understand the effects and side effects of the medication for depression by researching it. I had been studying mainly from textbooks, but I thought that I could gain more useful knowledge by studying diseases in relation to other conditions a regularly about so that I could answer the questions of patients and their families.
Understanding for IPE	"Understanding the perspectives that doctors consider through cases"	I could understand the focus of medical students by looking at patients through diseases and therapeutic drugs.

	Multidisciplinary cooperation is very important in medicine to provide high-quality medical care.
	I was able to learn a lot about the different perspectives of medical students.

Discussion

This study aimed to adapt the C & C approach as an IPE and evaluate its effectiveness. From our results, we found that the C & C approach has the same learning effect as a joint lecture between medical and nursing students and was able to bring about effective changes in understanding medical treatments and patients' feelings. These results are similar to those reported by Onomura et al. (2015). Pharmacology education lectures are generally conducted using a standardized teaching style, focusing on teachers' knowledge transfer and explanations. However, the C & C approach allows students to improvise and practice medical communication behaviors in a safe learning environment. In addition, this study shows that through this method, participants enhanced their communication skills and could better understand patients' perspectives and the roles of each profession.

First, understanding patients' feelings is an important aspect of patient safety. This is because understanding a patient's feelings will help healthcare professionals better understand the disease's perception and the patient's life background, which will ensure the continuation of medical treatment and facilitate the desired therapeutic effect. Through improvised role-playing in the examination office, the students learned about the importance of tracing the patient's life background in the decision-making process concerning medication choice, increasing their reliability of medication administration and stimulating their desire to learn about patient-centered communication (PCC). This is because both medical and nursing students demonstrated the importance of communication that promotes patient understanding. For instance, regarding communication skills, medical students learned concerning "the importance of communication, including communication with family members," and nursing students extracted "communication skills for choosing the right words and responding accurately to patients' questions." Likewise, with respect to the concerning patients' perspectives, medical students learned "the importance of choosing words to promote a better understanding of technical terms," and nursing students learned "the importance of observing the anxiety of patients and their families during explanations." Epstein and colleagues (2005) defined the critical domains of their PCC model as understanding and presenting patient perspectives, as well as comprehending the patients' social background. The findings of our study align with this definition, indicating that students have understood the importance of PCC. Therefore, we assert that the use of C & C approach in IPE provided an opportunity for students to learn PCC in a simulated clinical setting.

Second, improvised role-playing by some students may have helped the observers to learn. The results of the open-ended analysis suggest that observers learned how to effectively explain

patients (as a part of their own behavioral repertoire) by observing the role-play. Moreover, based on a literature review, O' Regan and colleagues (2016) reported that the learning outcomes of observers were equal to or better than those of the participants in the simulation. This can be better explained by Bandura's learning theory (Sukemune et al., 2019), which states that "It can also be acquired vicariously by observing the actions of others and their results." Through observation, observers can develop behaviors without trial and error, experience feelings by watching others and resolve fears through others' experiences, which may help them overcome their fears and increase their ability to communicate effectively with patients and work efficiently with other professionals in practical settings. We propose that this is an appropriate educational method that can provide clinical practice experience, as it provides an opportunity to improve medical communication in a safe learning environment. Furthermore, small-group improvisational workshops that have been used to improve medical students' communication skills (Fessell et al., 2020; Hoffman et al., 2013; Neel et al., 2021; Shochet et al., 2013) could be extended to nursing students and conducted in the form of C & C to instill valuable skills for providing empathic and supportive patient-centered care, as it may be a valuable communication learning opportunity for providing empathetic and supportive patient-centered care.

Third, students learned about the different perspectives of other professions by acting out patient-centered communication situations and by observation. The medical students learned about nursing students' perspectives on dealing with patients" and the nursing students learned about "understanding the perspectives that doctors consider through cases." This learning experience helped the students to learn the importance of understanding their roles and that of teamwork as future healthcare professionals. In addition, the results of the "understanding of IPE" questionnaire showed that approximately 80% of the medical and nursing students indicated that it was effective. In this C & C approach, students with different specialties participated as performers and observers in four different medical situations, which may have helped them to recognize each other's expertise. This included clinical reasoning, diagnosis, and drug treatment for physicians and managing life situations and patient and family care for nurses. Street et al. (2009) reported that interprofessional experience can help students acquire the skills needed to be part of a collaborative medical staff.

The Centre for Advancement of Interprofessional Education stated that "Interprofessional Education occurs when two or more professions learn with, from and about each other to improve collaboration and the quality of care" (CAIPE, 2002).

The Japanese IPE competencies include the four domains of role contribution, facilitation relationship, understanding for others, and reflection, which are the core domains of patient-/client-/family-/community-centered and interprofessional communication (Haruta et al., 2018). The students who participated in the role-plays had the opportunity to act out the collaboration between doctors and nurses, and the observers, through the role-plays and the explanations provided by the commentators, understood the expertise of the doctors and nurses, recognized their roles and responsibilities, and understood the importance of communication and teamwork from the various reactions of the patient roles. Therefore, the C & C approach

led to an understanding of interrelated tasks and limitations, and when applied as IPE, it can help students acquire skills for future collaborative care.

Meanwhile, only a few nursing students expressed a negative view of the C & C approach as a learning opportunity for IPE. Harder et al. (2013) reported that learners who did not value the observer role as highly as the practical role were bored. Since the students who expressed negative views may have been observers, the learning of the participants and observers should be considered in future studies. It is also assumed that these students, who were in their second year of nursing school, could not form a concrete image of the C & C approach because they lacked the experience of encountering situations in which they would collaborate with a medical team during on-site training.

Conclusion

The C & C approach has been shown to provide an opportunity for many students aiming to become different professionals to learn together. We identified four benefits of the C & C approach, namely: (1) it led to an understanding of the patient's perspective; (2) it taught the importance of communication skills; (3) it increased the motivation to learn through participation and observation; and (4) it deepened the mutual professional understanding of medical and nursing students.

We considered that these experiences led the students to rethink their previous learning style, which was biased toward knowledge acquisition and memorization, and to become aware of the need to adapt their acquired knowledge to clinical practice, thereby enhancing their motivation to learn. Nonetheless, a limitation of this study is the lack of baseline communication assessment scores, as there might have been differences in the evaluation of the C & C approach between participants' and observers' learning.

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Experiences of Anxiety During the COVID-19 Pandemic

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Abstract

Avoidance and self-isolation are often adapted as safety behaviours to manage social anxiety. However, such safety behaviours were actively encouraged throughout the COVID-19 outbreak to reduce the spread of infection. This study aims to explore the impact of pandemic-related social isolation among anxious and non-anxious university students. Participants were screened using the Generalised Anxiety Disorder Questionnaire (GAD-7) and allocated to anxious and non-anxious groups based on their scores. Fifteen participants (9 female and 6 male) were interviewed remotely (mean age=28.6). The study found that whilst social anxiety and anxiety about pandemic related socialising co-occurred, there were no distinct differences between the two groups. Instead, intragroup difference (the impact of COVID-19, adaptability, and self-development) differentiated participants' experiences. An increased desire for human connection, online communication, and the perspective of others were protective factors against the development of social anxiety related to pandemic lockdown for participants, regardless of their group. This research develops the field in understanding early pandemic experiences and its link to social distancing and isolation practices.

Keywords: college students, COVID-19, lockdown, social anxiety social distancing, social isolation

Social isolation is a key area of study as social connections are an integral element in peoples' lives, acting as a protective factor against the development of mental health difficulties (Cohen & Wills, 1985). A fear of social situations can characterise social anxiety due to an individual's perceived risk of being harshly judged by others (Leary & Kowalski, 1997). Clark and Well's (1995) cognitive model of social anxiety postulates that safety behaviours maintain social anxiety. These are activities performed due to a belief that this will prevent the occurrence of the feared outcome (Salkovskis, 1991). The maintenance of social anxiety through safety behaviours has been confirmed by various experimental studies, as the person prevents themselves from gathering disconfirmatory evidence about their negative social beliefs (Amir et al., 2008; Mellings & Alden, 2000; Spurr & Stopa, 2002; Stopa & Clark, 2000; Woody, 1996).

While social isolation is typically an individual choice, externally imposed isolation occurs in certain circumstances, such as in prison populations and mental health facilities. Haney (2003) found that imposed isolation in prison results in loss of control, anxiety, hopelessness, and depression. Alizamar and colleagues (2018) reported that 51.52% of young prisoners experience profound social anxiety suggesting that they feel anxious about interacting with the community due to imposed isolation. A review of patients forced into seclusion in mental health wards reveals intensified feelings of frustration at the lack of free movement, powerlessness, feeling undermined, and abandoned (Lindgren et al., 2019). Furthermore, Meehan and colleagues (2000) noted that the experience of seclusion within the mental health units results in avoidance of talking and interacting with others due to the fear of returning to seclusion.

The literature suggests self-elected social isolation and externally enforced social isolation may maintain and increase the risk of social anxiety and decline in mental health. However, it is unknown whether the experience of social isolation due to government advice during a pandemic might bring about social anxiety. Perrin and colleagues (2009) reviewed studies conducted during previous pandemics, such as Ebola, SARS, and Swine Flu, noting increased feelings of rejection from society, depression, and social dysfunction in approximately 12% to 33% of survivors forced to quarantine.

In a study of the impact on attitudes during COVID-19 in the Indian population, more than 80% of the people were preoccupied with the thoughts of COVID-19, and 72% reported the need to use gloves and sanitisers (Roy et al., 2020). The recent published studies reported that mental health vulnerability and preoccupation with COVID-19 bled into perspectives on socialising, increasing levels of social anxiety for the general population and individuals with pre-existing mental health issues (Kindred & Bates, 2023; Samantaray et al, 2022).

There may also be protective factors of externally imposed social isolation for the general population. Perrin and colleagues (2009) discuss protective factors during a pandemic, such as feeling connected to one's family and loved ones and having more time to take care of one's mental health. Loneliness, a known contributor to mental health problems, may be buffered by access to technology (Smith et al., 2018), something which is now accessible to more people than ever before. Furthermore, Sippel and colleagues (2015) advocated for the importance of social networks during a trauma experience, as these serve to promote resilience.

The current study aims to explore university students' experiences of imposed societal change during the COVID-19 global pandemic via two research questions. First, do pandemic-related social distancing and isolation practices lead to feelings of social anxiety? Second, do the experiences of those with social anxiety differ to healthy controls during the pandemic lockdown?

Method

Study Design

This is a qualitative study exploring people's experience of the COVID-19 pandemic. It adopts a cross-sectional design as participants were interviewed two months into a government-imposed lockdown in response to the COVID-19 outbreak in Ireland. The two participant groups of this study were separated by their scores on the Generalised Anxiety Disorder (GAD-7) questionnaire.

Participants

The data collection in this study was approved by the Education and Health Sciences Research Ethics Committee 2020_04_13_EHS. Participants were recruited via email to the entire student body. Following their expression of interest, participants were sent a comprehensive information sheet and screening questionnaire. They were also required to electronically sign and return an informed consent form. Seventeen expressed interest, but two failed to respond to follow up so there were 15 participants interviewed (mean age=29.93, SD=10.92) (see Table 1).

Table 1
Participant Demographics

Code	Age	Gender
Non-anxious Group		
A001	33	Female
A002	19	Male
A003	24	Male
A004	28	Male
A005	20	Male
A006	22	Female
A007	29	Female
A008	29	Female
A009	57	Female
Anxious Group		
B001	28	Female
B002	45	Female
B003	27	Male
B004	19	Male
B007	21	Female
B008	28	Female

Procedures

Upon receipt of the GAD-7 screening questionnaire, participants were separated into two groups by the principal investigator, based on their scores. Participants whose scores were lower or equal to the clinical threshold of ten were allocated to the 'Non-Anxious' Group A, and those whose scores were higher than the clinical threshold were allocated to the 'Anxious' Group B. Participants were assigned an identifying code based on their group allocation. This categorisation of groups was reserved from the researchers conducting the interviews to ensure double-blind interviewing. This controlled for biased responses from the researchers during an interview. All procedures contributing to this work comply with the ethical standards of the relevant national and institutional committee on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Participants were invited to engage in a 20-minute Skype for Business audio call interview. Participants were asked questions from an interview guide written by the research team to inform a semi-structured interview process. This guide included questions about their experiences of social isolation and social distancing due to the COVID-19 pandemic as well as questions pertaining to their general mental health and well-being.

Interviews were recorded using encrypted Skype for Business software. Participants were informed of the recordings and of their right to exclude themselves from the interview and study at any time. Audio files were anonymised, and password protected. They were kept on a secure server until transcribed, at which point they were deleted. Audio files and transcripts were anonymised by identifying interview transcripts with codes in lieu of participants' names. A list of participants' names and corresponding codes was kept on a password-protected file on an encrypted server in line with GDPR. The data that support the findings of this study are available from the corresponding author upon reasonable request.

Analytical Approach

Both research questions were addressed via thematic analyses (Braun & Clark, 2006; Guest et al., 2012). The analysis consisted of six stages: data familiarisation, the generation of initial codes, grouping these into themes, reviewing themes, defining themes, and producing the output.

A semantic approach was adopted to attempt to reflect the meaning of participants' reality (Boyatzis, 1998). No meaning beyond the content of what the participants said was generated. The second research question entailed comparing Group A and Group B data sets. For this, a comparative thematic analysis was conducted by an analysis matrix.

Results

Social Anxiety Differences Between Groups

The impact of isolation on social anxiety was divergent. Social anxiety increased as participants experienced anxiety about the virus when socialising with others. Nevertheless, participants reported buffers against the development of social anxiety including an increased desire for human connection, embracing online communication, and learning to value close relationships. From these results, four themes were identified, summating the divergent effect of isolation on social anxiety (virus anxiety, increased desire for human connection, perspectives on others, and online communication).

Virus Anxiety

Participants reported feeling uneasy about socialising with others due to the risk of contracting/spreading COVID-19. In addition, they spoke about a new-found awareness of physical distance and virus protective measures when interacting with others, which added a layer of stress to social interactions.

> *I was like, do you have a mask, do you have gloves, we like can't touch each other, and just very cognisant of the PPE…I think it definitely has changed how I think about socialising (…) it is a little more uh, stressful. (B001)*

Participants felt these concerns would change how they experienced activities where socialising with others would naturally occur. They reported that these concerns would, in turn, make them more anxious about doing daily activities, "Meeting up with family we'd always meet up quite a few of us together, so that's a concern like… how many people do you meet? Is it safe? So yeah, I'm concerned about that" (A009).

Increased Desire for Human Connection

Many participants felt an increased appetite for social connection stemming from both imposed restrictions and experiencing a slower pace of life. In addition, they reported an increased appreciation for the value of relationships.

> *I think that it's actually great in a way as well that it kind of enforces everybody to be a bit more, how do you say, em, calmed down (…). Whereas before, you know you have friends that are super busy, you have family that are very busy, and it's kind of giving like an excuse to be able to connect with other. (A007)*

Some participants reported a desire to push themselves past their usual comfort level when lockdown ended, even when they might have struggled with meeting others previously.

> *Everyone wants to be appreciated and everyone wants to make connections with those around them and when you are deprived of that opportunity, I think it has opened my own perspective up to, um, just be more confident (…) Like, we have some commonalities just because we're human that you can connect to anybody and find something to appreciate. (A006)*

Online Communication

A buffer against isolation was the embracement of online methods of communication. Participants reported utilising new ways to communicate to fulfil their social needs, "I suppose like if we were to meet up maybe once a month or whatever that's kinda gone online now so we're doing a lot of online gaming like playing poker online or having a few drinks online" (A004). However, this only suited some participants, and some reported missing out due to not being suited to this way of communicating.

> *I know I'm not really interested in that because first of all I've done it and oh what do you call it hasn't been good the quality of… Zoom (…) from that point of view, you don't have the same face to face communication and that's been difficult. (A009)*

Perspective on Others

Most participants were isolating with the people they valued. They reported thriving in lockdown due to more time spent with these people.

> *I've been blessed to have social interaction on a daily basis just with people who are isolated with me and without that (…) I don't think it would have been as healthy of a transition pre Covid to post Covid isolation. (A006)*

However, rather than having an insulating effect, it caused many to reflect on those they value. Some were away from friends/family due to being in lockdown in a geographically distant area. These participants reported a sense of not only missing these valued others but missing them and valuing them more as a result, "I do miss the family alright because I am renting down in Limerick, so I don't get to see them as often as I'd like" (A003).

Comparative Between-Groups Thematic Analysis

The study did not find significant differences between groups' factors. However, there were intragroup differences in the pandemic experience that differentiated participants' experiences with the lockdown (the impact of COVID, adaptability, and self-development).

The Impact of COVID

Participants highly emphasised the importance of having adapted a space to study and its impacts on their experience of home isolation. The example below portrays the positive impact

of having a dedicated workspace and a positive perception of individuals with whom they isolate.

> *My study situation is pretty good (…) I had em an office to myself and it, I just moved all my notes and things in there and yeah it was very quiet and I have good internet access and it was good (…) I got to spend so much time with my sister and go out for walks every day and we started a garden and it was great. (B007)*

Similarly, the example below depicts a positive perception of the flatmate and having a place to study.

> *Study environment is, uh, significantly changed since Covid but usually revolves either in my room at the desk that was provided or upstairs (…) I've been blessed to have social interaction on a daily basis just with people who are isolated with me and without that (…) I don't think it would have been as healthy of a transition pre Covid to post Covid isolation and quarantine restrictions. (A006)*

In contrast, individuals who found themselves in an environment that did not promote an adaptable study space experienced an adverse impact on their well-being and a negative view of their housemates.

> *I would say I was a bit more irritable than usual, I would say with housemates more specifically, obviously due to being cooped up together and people maybe not being as conscious as others in terms of, eh, kind of respect…(laughs)…when trying to focus on studying in the house. (A007)*

Adaptability

Another observable intragroup difference was the adaptability to the experience of social isolation and lockdown. Participants differed in their disposition and openness to using online platforms to fulfil their social needs. Participants who embraced the novel and widespread method of social interaction reported a positive impact on their social competence and enjoyment from social interactions.

> *I think online interactions and engagement are where I see the most change happening in myself. Um, for instance there was a brunch Zoom call this morning and it was… more comfortable talking to individuals who I've never met before just online that it would have been two months ago. (A006)*

Participants found that the negative impact of social distancing was mitigated by communicating via online tools, as outlined in the example below, "I do miss my close friends but yeah, we do talk over social media and stuff so it's not too bad to be honest (…) not being able to see my friends isn't a massive thing for me" (B007). However, participants who were

not able to adapt to online social communication methods reported a loss of social interaction and disrupted mood.

> *I find it frustrating being on the phone to somebody (...) If I can't actually like see your face when I'm talking to you, you know in a real kinda of sense I don't really see the point kind of thing you know, which sort of fed into COVID-19. (A008)*

Self-Development

Participants engaged in a significant amount of positive self-reflection due to the pandemic as a result of social isolation and national lockdown. Contemplating life before the pandemic made participants exhibit gratefulness for aspects of life, they would not appreciate prior lockdown. They also hoped to cherish life as it would come back to normal.

> *I think really, it really put in perspective that like jesus, we had it good (...) it will be weird sitting beside someone or sitting in a lecture hall because, you know you'd have taken that for granted before (...) On the whole though, if I were to guess how well I would react, I would probably be overjoyed. (A005)*

Due to isolation, participants experienced more compassion and understanding towards others and themselves. Moreover, they reported gaining self-confidence and feeling more connected with other individuals.

> *Everyone wants to make connections with those around them and when you are deprived of that opportunity, I think it has opened my own perspective up to, um, just be more confident (...) Like, we have some commonalities just because we're human that you can connect to anybody and find something to appreciate. (A006)*

In contrast, some participants also displayed conflicting feelings and low involvement in positive self-development. Social withdrawal secondary to the fear of being negatively impacted by friends' behaviour was observed.

> *Some of my friends don't, are a bit ignorant to be honest about the pandemic (…) I suppose you just have to think about, like why your friends with them and I suppose, it's, it's the further you keep people, the closer that people are to you the more it hurts so maybe it's easier to keep people at a distance. (B007)*

Discussion

Thematic analysis was performed to investigate whether the pandemic-related social distancing and isolation practices lead to feelings of social anxiety. The findings suggest that while there was an increase in anxiety related to the virus, social distancing and isolation practices did not lead to feelings of social anxiety in answer to research question one. Those findings are supported by Zhang and colleagues (2020), who found that introducing safety measures such

as lockdowns and social distancing reduced social anxieties by increasing psychological distancing. In addition, a study by Ho and Moscovitch (2021) found that individuals who experienced high pre-pandemic social anxiety made a significant effort to link with others and had a stronger desire for social support.

The present study proposes that participants experienced shared anxiety regarding COVID-19. The results are consistent with research on college students and young people which has detected a high prevalence of anxiety and fear related to the virus itself, including fear of contracting and passing the virus to others (Liu, et al., 2020; Park et al., 2021; Son et al., 2020). Similar to the present findings, participants in a study by Farris and colleagues (2021) reported increased anxiety when socialising due to the fear of the virus and the frequent use of protective measures such as gloves and masks.

The current study revealed that individuals had an increased desire to link with others and found it easier to engage with them due to a less busy lifestyle. Such desire and engagement served as protective factors against the development of social anxiety. The results are consistent with the buffering hypotheses by Cohen and Willis (1985), suggesting that social relationships and support can buffer stress-provoking events. This was evidenced by Park and colleagues (2020) who found that participants proactively looked for emotional and social support to cope with COVID-19 related stressors, such as changes in social routines and unknown duration of social distancing. Furthermore, research by Taylor and colleagues (2022) in the UK, found that those individuals who dedicated more time to their families saw the lockdown as an opportunity to have meaningful social connections.

Our findings suggest that people use online communication to fulfil their social needs during lockdown. Perez-Brumer and colleagues (2022) supports this observation revealing the intense use of virtual communications during COVID-19 to obtain emotional and social support. In addition, Taylor and colleagues (2022) showed that individuals exhibited gratefulness for the ability to stay in touch with family and friends via online means. Similarly, research on Italian students revealed that participants who perceived COVID-19 as an adaptation to a new life routine reported enhanced and strengthened social connections via video calls (Procentese et al., 2021).

The current research found no difference between the anxious and non-anxious groups during the lockdown in answer to research question two. Nevertheless, intragroup differences existed regarding the impact of COVID-19, adaptability, and self-development.

The link between study space and emotional experience of lockdown found by the present study has also been identified elsewhere. Rahiem (2021) detected that Indonesian students' motivation to learn during COVID-19 isolation was linked to the ability to create an adaptable learning space according to their needs. In Romania, Curelaru and colleagues (2022) noted that college students without an adapted home study space found themselves highly distracted by other household members. They also noted that the absence of intimacy and exposure to noise contributed to negative learning experiences.

Our study noted a divergent impact of online communication on social relationships. A similar divergence was noted by Vancappel and colleagues (2022). Either participants employed online communication to link with others, resulting in high enjoyment and satisfaction from social relationships or they expressed disappointment with the lack of direct communication, finding online communication to be incomparable to more direct relationships. Earlier in the pandemic, Gabbiadini's (2020) research was less ambivalent, noting the positive impact of digital technologies in sustaining social connections during COVID-19 isolation. The mitigating effect of positive social relationship on feeling socially isolated was clearly noted within the present study.

Our research found that some participants used social isolation as a time for self-development, which resulted in increased self-compassion, gratefulness, and self-confidence. However, for others, there was no such growth in mindset. Once again, the study by Vancappel and colleagues (2022) supports our results, revealing that personal growth, increased resilience, and introspection developed from having more free time during lockdown. Recent study by Asmundson and colleagues (2021) reported that 77% of people experienced medium to high personal growth characterised by an increased appreciation for those close to them and a reprioritisation of what is of significance. As with the two previous findings, however, the outcome for participants was twofold; whilst many people did report personal growth, some participants did not, mirroring the findings of our study.

Limitations

The authors acknowledge the number of limitations within this study. The sample was solely composed of a limited number of college students dealing with specific academic stressors. These stressors may have served as a trigger for anxiety. It is also plausible that the sample does not represent the general population, given that people with higher education levels experience more significant anxiety and stress levels during a pandemic (Salari et al., 2020). In addition, the GAD-7 used in this study was administered during the initial stages of the pandemic. It is possible, therefore, that the measure was not capturing generalised anxiety, but anxiety linked to the COVID-19 virus. This would account for the lack of discriminate inter-group findings.

Implications

The qualitative nature of the research provides a unique perspective of an individual's experience in the weeks after the introduction of the first lockdown in Ireland. A scarcity of scientific literature investigating the early onset of the COVID-19 pandemic was conducted outside of China, the original epicentre of the virus. China is a collectivist society stressing the needs, desires, and interests of others before its own (Michailova & Hutchings, 2006). Western societies, including Ireland, are individualistic societies that emphasise the higher importance of individual experience and perception of autonomy from the society (Hofstede et al., 2005). We suggest that societal differences can affect how pandemics and social isolation impact social anxiety.

Conclusion and Further Study

In conclusion, this study is one of a few that explored early pandemic experience and its link to social distancing and isolation practices. The study provided exceptional findings that revealed social anxiety did not increase due to the isolation and social distancing practices. Moreover, there was no difference in the experience of social isolation between anxious and non-anxious participants, only intragroup differences. Our study provides a base for future research to explore a link between lockdown and social anxiety and its effect on anxiety. Further studies might explore the difference between individualistic and collectivist societies and the experience of social isolation during lockdown.

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