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Effects of e-learning on master EFL students' academic achievement: A case study

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ABSTRACT

The rationale of the present paper is to investigate the effectiveness of e-learning anent the students' academic achievement in English as a foreign language. A case study has been conducted at department of letters and English language by taking into consideration the students from two different master sections at Ain-Temouchent University namely, 'didactics and applied linguistics', and 'literature and civilization'. Through the use of an online questionnaire, the results revealed that the majority of the respondents under investigation approve the idea that e-learning has a positive impact on the academic performance and success of the learners, and that e-learning can be a complementary aspect to classroom learning for the best possible outcomes as regards academic achievement.

Keywords: academic achievement, e-learning, English as a foreign language, effects, master students

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INTRODUCTION

E-learning is a concept that stands for 'electronic learning', which, if we look closely into, is the use of electronic technology in learning/ teaching process. This method of learning is widely used in every developed and developing country for the sake of increasing the quality of education given to learners. Technology in education comes in all types and forms thanks to the enormous advantages it offers.

In Algeria as in many other developing countries, the Ministry of Higher Education has, currently, started to seek a proper incorporation of e-learning in learning syllabi, in general, and in foreign language teaching, in particular, to adapt with the wave of globalization of e-learning from other universities belonging to different developed nations. This, in fact, may not be sufficient to the average student especially the one studying at the University of Ain-Temouchent.

Therefore, this paper aims to analyze and investigate the effectiveness of e-learning as regards the academic achievement of English foreign language (EFL) master two students from two discrepant sections at the department of English affiliated to the faculty of languages and social sciences in the University of Ain-Temouchent. To fulfill the study objectives, an online questionnaire has been administered to the participants from two different master's sections: *didactics and applied linguistics* and *literature and civilization.*

This study seeks to provide answers to the following research questions:

1. In what ways can e-learning be effective when it comes to academic achievement and success?
2. How is it possible for e-learning to be complementary to classroom and traditional learning?

To connect the dots, the following hypotheses are proposed:

1. E-learning is effective when it comes to the student's academic achievement and greatly contributes in his/her success.
2. E-learning can be used as a complementary tool in addition to classroom/traditional learning to enhance the learners' academic achievement.

Definition of E-Learning

In order to gain a clear understanding of what e-learning is, It is worth-considering different definitions from different views of scholars bearing in mind that the letter 'e' in e-learning stands for the word 'electronic' and its meaning is not changeable or modifiable. E-learning is a broad combination of processes, content, and infrastructure to use computers and networks to scale and/or improve one or more significant parts of a learning value chain, including management and delivery (Aldrich, 2004). Perhaps a more inclusive approach is best in defining e-learning, as suggested by Sangrà et al. (2012). In their research of the various definitions of e-learning, Sangrà et al. (2012) suggest the following wording resulting from their analysis:

> E-learning is an approach to teaching and learning, representing all or part of the educational model applied, that is based on the use of electronic media and devices as tools for

> improving access to training, communication and interaction and that facilitates the adoption of new ways of understanding developing learning [...] e-learning is part of the new dynamic that characterizes educational systems at the start of the 21st century, resulting from the merge of different disciplines, such as computer science, communication technology, and pedagogy [...] the concept of e-learning can be expected to continue to evolve for a long time (pp. 152-154).

E-learning is used throughout this paper in the general meaning of education delivered via technological means, which includes digital platforms, but most importantly, though not exclusively, the Internet, and *distance learning* in the sense of any education occurring at a distance.

Impact of COVID-19 on Learning/Teaching Process

In the late months of 2019 and the beginning of 2020, a new highly infective virus to human beings has emerged "the virus can spread from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe" (World Health Organization [WHO], 2019). Education has been hit particularly hard during the COVID-19 pandemic as many schools and educational institutions from around the world including Algeria were forced to cease using traditional face-to-face educational method and to migrate towards a newly developed method called e-learning.

This approach had an impact on both students and instructors who were forced to modify their approaches and methods, which resulted in making different strategies. On the one hand, students were faced with independency. Independent learning is defined as a process and a philosophy of education, where learners gain knowledge through their efforts while developing the ability to inquire and evaluate (Bonham, 1992). On the other hand, instructors used virtual meetings by means of computer/phone apps such as Google Classroom, Google Meet, Moodle, Skype, and Zoom.

Comparing e-learning with traditional learning, some researchers such as Wagner et al. (2008) found that e-learning is more effective than traditional learning. However, some have turned it down because of reduced social interaction, high investment costs, and technical problems with communications and computer technology. One of the most popular and traditional methods of delivering knowledge is through this method in face-to-face learning.

Adaptation of E-Learning by Algerian Universities

Algerian universities have gone through a reform of bringing the composition of degrees into accordance with international standard called LMD (licence, master, and doctorat), which translates in English to bachelor, master, and PhD. The information and communications technology (ICT) has become a hope for university institutions that started facing many obstacles and problems including the increasing number of students, the lack of framed structures and pedagogical buildings, etc. This hope came under the emergence of modern technology as an assisting solution to face these obstacles.

To discuss education in any form and in any country, its background needs to be analyzed. The government of Algeria spent huge efforts to increase the efficiency of its educational system standards and targeted clear main objectives that were mentioned in a report published by the Ministry of Communication and the Ministry of Higher Education within the "priorities and planning report for 2007." The main strategic objective that was mentioned is the establishment of a system of distance of education as a support for modern civilizational formation and to join Algeria with global learning standards. It was a clear message of the Ministry of Higher Education that higher education institutions must adapt a clear strategy and general policy to adopt this modern educational system into universities and to aware students of this evolving into a supportive environment and policy on the national level to integrate ICT.

Algeria has started its own e-learning system by doing a collaboration with the Ministry of Communication and the Ministry of Higher Education with, not only international ICT developers such as the American giants "Microsoft" and "Thomson", but also Chinese technology developers such as "Huawei" and "ZTE", and local mobile operators in order to develop an ICT infrastructure in Algeria through opening the Algerian market for these developers and operators.

This resulted in a major increase in communication and the Internet quality in the majority of the country throughout the years. For example, according to Guemide and Benachaiba (2012), an astonishing increase of operator's subscribers reaching 87.0% at the end of 2012 thanks to the third and fourth generation of wireless mobile telecommunications technology also referred to as "3G" and "4GLTE", but also to the modernization of the Internet connectivity through the upgrade of asymmetric digital subscriber line "ADSL" cables to a more powerful cables referred to optic fiber cables that are capable of delivering a remarkable higher amount of the Internet bytes (Guemide & Benachaiba, 2012).

Another factor to ensure the success of e-learning or ICT in Algerian universities is the development and improvement of their services towards the student by introducing new technological means, which include not only computers, printers, CDs, but also, recently, digital ones such as websites of courses for different study fields–like the case of EFL students of Ain-Temouchent University–through the means of "*Moodle*." This latter is a platform for online learning that enables teachers and online developers to create online courses, add assignments, and keep an eye on their students' progress. It also allows teachers to communicate with their students and encourage communication between them in forums and discussions. Contents such as Microsoft Word Docs and PowerPoint Slides are included a lot in Moodle software (Costa et al., 2012, p. 4).

E-Learning & Academic Achievement

The impact of e learning is increasingly dominating the current educational system as the impact of technology, continuously, dominates our day-to-day activities worldwide (Bass, 2006). Other studies from different scholars such as Cardak and Selvi (2016) opine that there are some aspects that have a significant relationship with implementing e-leaning towards academic performance among students. The major goal of e- learning is to improve students' academic achievement while also increasing accessibility to education and lowering expenses and time. It helps in enabling access to efficient teaching and learning; thus, improving efficiency for students who tend to have a difficult situation when it comes to the perfect time for studying, i.e., time flexibility (Abdel & Shalash, 2020).

This mode of instruction allows learners from several places to attend the same classes practically simultaneously. In addition, it motivates students and improves their academic performance by encouraging self-learning and providing a sense of ease in use and

Table 1. Students' field of study

Section of study	Didactics & applied linguistics	Literature & civilization
Number of students (n)	30	10
Percentage (%)	75.0	25.0

Table 2. Students' generation

Generation	Generation Z (Gen Z)	Millennials (Gen Y)
Number of students (n)	36	4
Percentage (%)	90.0	10.0

Table 3. Students' level in English

Proficiency level in English	Mastery (C2)	Advanced (C1)	Intermediate (B2)
Number of students (n)	8	27	3
Percentage (%)	73.0	20.0	8.0

interaction, allowing for more flexibility in learning time, monitoring academic performance and giving instruction in online courses are important issues for educators. Because of the spatial, temporal, and interactive distance, this mode of education necessitates higher commitment, accountability, and self-regulation of learning in order to achieve educational goals. Educators want devices to systematically monitor and evaluate students' academic achievement in this regard.

METHODOLOGY

Description of Target Situation

This case study was carried out in the Department of Letters and English Language at Ain-Temouchent University. It is worth-mentioning that this study does not involve all the students of English, but rather those of master two sections of 'didactics and applied linguistics' and 'literature and civilization'.

Students' Profile

The sample population is a random sampling, which includes 30 students of the didactics and applied linguistics master section and 10 students from literature and civilization. Most students share the common fact that they are part of Generation Z, which means that they are born between the year of 1994 and 2000 and use the information and communications technologies very often.

Research Instruments

An online questionnaire was administered to the selected participants and to collect their different viewpoints about the incorporation of e-learning in the teaching/learning process along with its effectiveness in promoting academic performance. To this end, two types of questions were used: closed questions, where the responses of the respondents are limited to a set of options. However, open questions entail questions, where the answer is completely unstructured, and the respondent has the opportunity to express his/her ideas accordingly. The students' questionnaire is composed of seven questions, which aim at gathering information about the incorporation of electronic learning in master two EFL classrooms, and its effectiveness in enhancing EFL students' academic proficiency.

The questionnaire was sent to the respondents through their e-mail addresses and Facebook accounts to gather as many data as possible; this has proven to be a very effective way to reach the students. Additionally, a mixed-methods approach based on both quantitative and qualitative approaches to analyze the gathered data was used. The anonymity of the participants has been kept to avoid any bias and prejudice.

ANALYSIS OF STUDENTS' ONLINE QUESTIONNAIRE

This section is devoted to the analysis of the results obtained from the online questionnaire administered to the target population.

Question 1. In What Section Do You Study?

According to **Table 1**, the majority of the respondents (75.0%) are affiliated to didactics and applied linguistics master two section, while a minority rating (25.0%) are affiliated to literature and civilization.

Question 2. From What Generation Are You?

Table 2 shows that the great majority of EFL participants who study at the university of Ain-Temouchent are born between 1994 and 2002, which means that they are part of Generation Z, while the remaining 10.0% of the students are from an older generation (Generation Y/Millenials).

Question 3. How Do You Evaluate Your Level in English?

According to **Table 3**, more than 70.0% (72.5%) of the students have an advanced level in EFL, which means that they can produce clear, detailed text and interact with a degree of fluency and spontaneity, while 20.0% of the participants have a good mastery level in EFL, they can understand and express everything with ease, and differentiate finer shades of meaning. The remaining (7.5%) consider themselves to have an intermediate level in English proficiency.

Question 4. Do You Learn More Easily Through E-Learning?

The results obtained from this question show that the majority of the respondents (87.5%) learn more easily through electronic learning and feel comfortable; they also experience great easiness and comfort while using e-learning technologies, while a very small minority (5.0%) does not experience the same easiness that the majority has (**Table 4**).

Question 5. If Yes, How?

The respondents were given the freedom to select more than one answer; the responses were somehow balanced (**Table 5**). More than 69.0% of the students said that they prefer e-learning as it gives them complete control over time and convenience for learning, but also for the freedom on picking the right courses from the Internet. More than

Table 4. Easiness using e-learning for studying EFL

Difficulty in learning EFL through e-learning	Yes	No
Number of students (n)	35	5
Percentage (%)	87.5	12.5

Table 5. Advantages of using e-learning for studying EFL

Advantage of using e-learning	Score	Percentage (%)
Gives complete control over time, pace, & convenience for learning	25	69.4
Freedom on picking right courses from the Internet	25	69.4
Cost-effectiveness	12	33.3
Can communicate with my teacher at anytime	21	58.3

Table 6. Difficulty in using e-learning for studying EFL

Difficulties using e-learning	Score	Percentage (%)
Bad internet access at home	26	65.0
Unable to learn individually	8	20.0
I do not have enough computer literacy skills	3	7.5
I do not encounter any issues	15	37.5

Table 7. Preferred method of studying

Answer	Yes	No
Number of students (n)	28	12
Percentage (%)	70.0	30.0

58.0% of the participants (58.3%) believe that e-learning is preferable for the reason that it gives them the ability to communicate with their teacher at any time, while 33.3% of students say that it is more cost-effective and eco-friendlier than traditional learning.

Question 6. What Type of Laws Do You Come Across While Using E-Learning?

Here again, the respondents were provided the freedom to choose more than one answer to this question (**Table 6**). 65% of the participants claimed to encounter a bad internet access at home, which stutters their e-learning process; 20.0% of them said that they are not able to learn individually or independently from the traditional pedagogical environment; 7.5% of students reported that they do not have enough computer literacy skills acquired for using e-learning, while more than 30.0% (37.5%) of the participants opined that they do not encounter any sort of issue when it comes to using e-learning.

Question 7. Do You Find E-Learning Better Than Traditional Learning? Justify Your Answer

The majority of the participants (70.0%) who answered this question agreed on finding e-learning better than traditional learning when it comes to effectiveness in academic performance while the smaller minority (30.0%) believed that e-learning is not better than traditional or face to face learning (**Table 7**).

Look at these statements provided by some of the respondents:

> Student1: "It's easier for me to use e learning because I can learn EFL whenever I want wherever I want, and this helps me a lot as an individual learner."

This student prefers e-learning over traditional methods of learning due to the fact that the latter gives him the freedom in choosing time, pace and convenience for learning, which is one of the major advantages of electronic learning.

> Student2: "Through e-learning, I get access to any kind of lesson I want; I can choose one of the best teachers in the world to learn from. In addition, I can listen to native speakers of different English language accents regardless of learning any time and place that suits me."

This student prefers e-learning over traditional methods of learning due to the freedom that it offers when it comes to picking the right courses from the Internet.

> Student 3: "I'm used to computers and digital tools, which makes learning easier for me."

This participant relies on having enough computer literacy skills; he finds learning EFL through electronic learning and ICT to be easier than traditional methods of learning.

Student 4: This particular participant said that

"as part of the new generation, I find that all the matters related to my subjects of study can be researched on the Internet, which I find it much easier than searching through physical libraries or archives."

> Student 5: "I'm able to concentrate better and harder on my learning through traditional classroom learning because I'm a mom and there is less distraction than when I'm at home."

This student finds learning through online difficult due to the reason that she cannot concentrate properly at home; thus, she prefers traditional face to face learning inside the classroom.

> Student 6: "It is a complementary tool to traditional education; e learning could be a part of it."

This participant believes that traditional learning would be more effective if e-learning is involved in it.

DISCUSSION

Based on the results obtained for this study, the first interpretation that can be revealed from the participants' responses concerning the effectiveness of e-learning when it comes to academic performance, is a sort of a positive influence or effect on the learner. Indeed, the majority of the respondents, involved within this investigation, agreed that electronic learning and ICT in general have a significant impact on the learners' abilities to acquire EFL, and this is consistent with Wagner et al.'s (2008) study, where they found that e-learning is more effective than traditional learning. Each participant has his/her preferences when it comes to electronic learning as it gives many advantages that are suitable for their different and unique needs like some students find it easier to study at home while others are more familiar with computer literacy skills, which makes learning for them much easier.

The results also revealed that although the advantages of the electronic learning method are vast and many, some students may encounter certain difficulties while using it; the transition to e-learning might not be well-received and adopted from the concerned participants. For instance, one of the encountered issues that the students have faced are the immaturity of electronic technologies and the Internet in Algeria (bad internet connection) compared to more developed countries. This is mainly due to the fact that many Daîras, Wilayas and remote villages suffer from inequality, for they lack a viable and stable internet network compared to other more populated places. These results contradict with Abdel and Shalash (2020) who claimed that the major goal of e- learning is to improve students' academic achievement while also increasing accessibility to education and lowering expenses and time.

The collected data, from the students' questionnaire confirm the hypotheses stated for this study entailing that e-learning may be effective when it comes to academic achievement and success, and it can be complimentary to traditional learning. Students' responses revealed that e-learning is suitable for most of them to develop and acquire knowledge more easily due to several reasons. It has also been noticed that the majority of the participants (32 out of 40) have found an easy adaptation to e-learning, which renders EFL learning straightforward through electronic learning and information and communications technologies. This can be due to enabling access to efficient teaching and learning; thus, improving efficiency for students who tend to have a difficult situation when it comes to the perfect time for studying, i.e., time flexibility (Abdel & Shalash, 2020).

CONCLUSIONS & LIMITATIONS

The present study has been concerned with the effects of e-learning on academic performance of EFL master two students from two distinct sections affiliated to the university of Ain-Temouchent. Based on the hypotheses that e-learning has a significant impact in improving students' academic performance, and that E-learning can be complementary to classroom learning, a case study has been used to verify whether e-learning has a positive effect on the students' academic proficiency or not.

The results obtained have shown that most students experienced a positive occurrence while using it on their daily pedagogical tasks away from physical learning institutions such as the university. Almost all the students who participated in this study have taken advantage of one or many features that e-learning offers, which other teaching and learning methods lack. This includes the freedom of picking courses from the Internet at anytime and anywhere, where the nternet connection is available, the complete control over convenience for learning or even the ability to communicate with the teacher at any time through the use of communicational websites or applications. The results obtained for this study have resulted in the confirmation that e-learning has, indeed, an impact on the academic performance of the students. However, due the limitations that the Internet suffers from in general in some rural areas and villages in Algeria, which entail the lack of a stable and complete the Internet infrastructure and of which almost 80.0% of the participants suffer from, it has been deduced that even tough e-learning has a positive impact on the academic achievement of the master two students in one way or another, it is a far less effective experience in reality than its promoting and giant potential.

Briefly, although e-learning is in its baby phase and is still in the beginning of its evolution towards a prosperous future in Algeria, it cannot be ignored or just be left for the future students. Its implication in general pedagogical activities, needs to be provided even more than what it is in the year of 2023 to have an effective development and to improve the academic achievement of the students through the use of both e-learning materials and traditional learning materials to obtain a noticeable peak in academic performance from university students.

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Declaration of interest: The author declares no competing interest.

Data availability: Data generated or analyzed during this study are available from the author on request.

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Crisis risk communication and public behavior: Analysis of the COVID-19 pandemic in Pakistan

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ABSTRACT

This study underpins the crisis risk communication (CRC) theory, investigating the integral role of social media in Pakistan towards COVID-19, its influence on cognitive priming processes, and behavior regulation. Empirical findings reveal predominantly positive public sentiment toward preventive behaviors, with mask-wearing and sanitizer use widely embraced. However, the inclination to avoid gatherings with risk groups is comparatively lower. This collective adherence to preventive measures suggests a shared effort to curb COVID-19, influenced by factors like the perceived helpfulness of social media. The populace exhibits a predominantly favorable attitude towards COVID-19 vaccination, signifying widespread acceptance of vaccines within the country. Additionally, the study assesses public satisfaction with the government's pandemic management, revealing an overall positive sentiment. Nonetheless, concerns emerge regarding essential needs, including food, shelter, and treatment. Enhancing our insight, this study sheds light on the intricate interplay between CRC, social media, and public behavior amidst a health crisis. The insights gleaned from this study provide valuable guidance for policymakers and public health practitioners to refine future communication strategies and address societal concerns effectively during pandemics.

Keywords: COVID-19, crisis risk communication, social media, life-threatening factors, preventive measures, Pakistan

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INTRODUCTION

The world has witnessed several respiratory disease outbreaks in recent decades, with COVID-19 as the most severe and highly fatal virus among various contagious diseases. It ranks as one of the most devastating pandemics, impacting public health and the global economy, ranking as one of the most devastating crises since World War II (Christopher et al., 2020; Saqlain et al., 2021). Originating in Wuhan, China, on November 18, 2019, COVID-19 swiftly spread globally (Rothan & Byrareddy, 2020). The gravity of the situation prompted World Health Organization (WHO) to declare it a global health emergency on January 31, 2020. By January 2022, 59,365,688 confirmed COVID-19 cases and 934,735 reported deaths worldwide (Gavi Org., 2022).

COVID-19, primarily transmitted through respiratory droplets, is a rapidly spreading respiratory disease that often leads to severe acute respiratory syndromes (Aziz et al., 2022). The pandemic has had far-reaching effects, caused immense human loss, and disrupted various aspects of life, including public health, food supply, employment, work, and education on a global scale (Li et al., 2020). The socio-economic repercussions of the COVID-19 pandemic have placed millions at risk of extreme poverty, jeopardizing the livelihoods of a substantial portion of the global workforce and affecting 3.4 billion people (Nicola et al., 2020; WHO, 2020a, 2020b).

The infected individuals showed asymptomatic or displayed mild to severe symptoms. Approximately 80.0% of patients exhibited mild signs of the virus. The fatality rate hovers around 2.4% for critical and elderly patients. Studies indicated that symptoms of COVID-19 include sore throat and cough, headache, chills, fatigue, fever, shortness of breath, nausea, abdominal pain, vomiting, and diarrhea (Wang et al., 2020). The virus poses minimal risk to children and those with underlying cardiovascular conditions, but it is particularly lethal for those over 70 years old, with a fatality rate of 14.8%. The course of illness leading to death can vary from 7 to 14 days, depending on factors like age, immune response, and underlying health conditions (Gautret et al., 2020; Heneghan et al., 2020).

Every country worldwide responded to the crisis by applying recommended measures such as social distancing, lockdowns, confinements, travel restrictions, and vaccination campaigns. In line with global standards, Pakistan also employed these measures alongside robust testing protocols to diagnose COVID-19 cases (Aziz et al., 2022; Pakistan Health Department, 2020).

During the last period of the pandemic, a new variant, Omicron, emerged, known for its rapid transmission but comparatively lower fatality rates. Notably affected countries include the USA, France, Iran, the U.K., Russia, Brazil, India, and Italy (Akhtar et al., 2021). Pakistan also faced significant challenges due to COVID-19, with hospitalizations and fatalities peaking from April to September 2020 (Pakistan Health Department, 2020). The virus's impact was more pronounced in older individuals and healthcare workers, who faced heightened vulnerability (Rajewska et al., 2020).

Pakistan's Landscape of COVID-19

Pakistan, a developing nation with a population of approximately 220 million, faced significant challenges during the COVID-19 pandemic, especially in major urban centers like Karachi, Lahore, Rawalpindi, and Faisalabad (Abid et al., 2020; Aziz et al., 2022). As of August 30, 2020, the government reported 293,261 confirmed cases, 6,244 casualties, 276,829 recoveries, and 686 critical cases (Aziz et al., 2022). Limited resources, an overloaded urban population, and socio-economic disparities worsened healthcare (Abid et al., 2020).

The sharp spike in COVID-19 cases in early 2020 in major cities in Pakistan placed immense pressure on government hospitals, resulting in a surge of critically ill patients. Securing admission became a challenge due to the limited capacity of medical facilities, and the prohibitive costs of private hospitals rendered them inaccessible to a considerable portion of the population. A critical priority was addressing the shortage of ventilators. Some relief came through collaborative initiatives in local production (Abid et al., 2020; Aziz et al., 2022; Noor, 2022).

The government took many preventive measures to mitigate the pandemic. These include lockdowns, travel restrictions, quarantine, medical facilitations, and establishing vaccination centers (Aziz et al., 2022). Social and traditional media were used to disseminate needful messages to convince people to use preventive measures effectively against the pandemic (Noor, 2022). Despite these efforts, the public raised complaints regarding deficient food and medical supplies, the convenient availability of COVID-19 testing, and concerns about the admission of severe cases into government hospitals. Consequently, many COVID-19 patients reluctantly sought admission to costly private hospitals (Khattak & Daadullah, 2021).

Despite stringent measures such as lockdowns, restrictions on social gatherings, and the closure of educational institutions, the impact on daily wage earners was profound. Compliance with government COVID-19 standard preventive measures, particularly regarding social distancing, proved less effective among lower-income groups (Khattak & Daadullah, 2021). Pakistan's developing status and the occurrence of religious festivals posed additional challenges to the effective implementation of social controls (Aziz et al., 2022). While the government's response and information dissemination through media were generally deemed credible and useful (Aziz et al., 2022), the inconsistent adoption of SOPs and the emergence of variants like Omicron signaled ongoing challenges in maintaining uniform public behavior (Noor, 2022; Shazia et al., 2022).

Social Media & COVID-19

The COVID-19 pandemic significantly amplified the global impact of social media, with WHO designating it as the primary source of the COVID-19 "info-demic" in 2020. This phenomenon disseminated accurate information and misinformation, heightening global anxiety (Li, 2020; Li et al., 2020). McCombs and Stroud (2014) posit that uncertainty increases individuals' social and psychological need for information, drawing them to news media for clarity during uncertain times. Throughout the crisis, individuals instinctively turned to social media for updates, fostering a sense of connection and facilitating the exchange of experiences. However, it is crucial to note that social media sometimes amplifies rumors, contributing to uncertainty (Cinelli et al., 2020). Misleading content makes it challenging for individuals to discern credible sources, intensifying anxiety, fear, and stress during the pandemic (Huang & Zhao, 2020; Rodríguez-Hidalgo et al., 2020).

Nevertheless, social media played a pivotal role during COVID-19 by providing real-time information on the pandemic's progression, new cases, and evolving global and local scenarios. Its immediacy and networking capacity granted individuals swift access to vital information, influencing public concerns during crises and meeting the imperative need for relevant information (Aziz et al., 2022; Li, 2020; McCombs & Shaw, 1972; Smith et al., 2020). Aziz et al. (2022) examined the Pakistani government's purposeful usage of social media and mobile phones as successful public communication tools, particularly during crises. The government uses these channels to promptly communicate updates to the public, including critical aspects like identifying hotspots, carrying out targeted smart lockdowns, and advocating for COVID-19 preventative measures (Aziz et al., 2022). This study looks into the impact of social media on the perception of sanitary measures in Pakistan. With high illiteracy rates, especially among older people, social media is critical for crisis communication (Siddiqi, 2023).

LITERATURE REVIEW

The COVID-19 pandemic has had a huge global impact, inflicting extensive misery, death, and despair (Mouffak et al., 2021). Various challenges, including food supply, border closures, trade interruptions, and lockdowns, have paralyzed life and affected distress, worry, and overall well-being (Mouffak et al., 2021). The effective use of the media, specifically social media, prompted individuals to take protective measures against the disease (Akhtar et al., 2021). Every country uses its customized preventive measures to avoid the virus. Duan and Zhu (2020) report that people globally used common preventive measures against the COVID-19 pandemic, including mask usage, social distancing, handwashing using sanitizers, avoiding public gatherings, and adopting general hygiene standards. To mitigate the pandemic, international collaboration for sharing knowledge and resources was crucial for collective strategies, especially in developing vaccines. Although vaccines play an effective part in mitigating the pandemic, the media reported vaccine hesitancy in many people from different regions of the world (Sallam et al., 2022).

Relentless media coverage has contributed to mood disorders, and the shift to online education during lockdowns has amplified anxiety among students (Duan & Zhu, 2020; Gao et al., 2020; Huang & Zhao, 2020; Mamun & Griffiths, 2020; Rodríguez-Hidalgo et al., 2020). Disruptions in food and essential supply chains due to border closures and lockdowns have severe consequences, leading to job losses, illness, and loss of life (WHO, 2020a, 2020b). The psychological effects of COVID-19 have become a global symbol of fear, causing heightened anxiety and depression, particularly in directly affected countries (Huang & Zhao, 2020; Taylor, 2019). Factors contributing to fear include stringent lockdowns, economic disruptions, age-related concerns, immune system vulnerabilities, and underlying health conditions (Huang & Zhao, 2020; Taylor, 2019). Studies in China detected rising anxiety and depression rates as the pandemic unfolded (Huang & Zhao, 2020; Taylor, 2019). Fear levels related to COVID-19, measured on a scale of one to 10, revealed a score of seven among Americans, with distress escalating alongside the mounting case count (Fitzpatrick et al., 2020).

Disparities in fear perception across demographic groups, job loss association with elevated COVID-19 apprehension, and a surge in symptoms related to depression and anxiety were observed. Tragically, instances of suicide also increased due to pervasive COVID-19 fear (Mamun & Griffiths, 2020). Depression and anxiety among healthcare professionals in Latin America and other regions were also found to be high. Factors influencing susceptibility to COVID-19 highlight age, sex, and underlying health conditions as pivotal variables. However, young adults aged 19 to 25 exhibit mild symptoms, with males potentially bearing a more substantial disease burden than females (Cao et al., 2020; Rodríguez-Hidalgo et al., 2020; Su et al., 2020; Wenham et al., 2020).

Adoption of COVID-19 Prevention Strategies

The preventive measures against COVID-19, as highlighted by WHO (2020a, 2020b), include a range of practices, such as wearing masks, social distancing, handwashing, use of sanitizers, surface sanitization, observance of general hygiene, and proper coughing or sneezing etiquette. Adopting the mentioned preventive measures against COVID-19 is complex due to factors such as gender, belief, attitude, education, occupation, income, cultural values, tradition, and religiosity was also (Dohle et al., 2020; Sharifipour, 2020). In the Pakistani situation, various socio-economic factors shape individuals' behaviors to protect themselves from the disease. The decisive factors for adopting preventive measures include the virus's perceived severity, age, and immunity levels of individuals (Khattak & Daadullah, 2021).

People in different regions and countries adopted preventive measures against COVID-19 at different rates; Khattak and Daadullah (2021) highlights that individuals in Pakistan showed health-protective behavior, with 85.0% adopting mask-wearing in public spaces and 65.0% practicing social distancing. Similarly, Peng et al. (2020) reveal a high level of virus awareness among participants, coupled with a positive inclination toward preventive measures in China. Other nations have adopted protective measures based on their circumstances in response to the global health threat of COVID-19 (Khattak & Daadullah, 2021).

COVID-19 Risk Factors

The severity of COVID-19 was observed as a severe illness, and the potential fatality in individuals affected by the disease accentuates adherence to preventive measures (Shi et al., 2020). Although both genders contracted the virus, however, females face a relatively higher mortality risk. Studies also reveal that individuals with cardiac issues are susceptible to mortality risk. Children showed a lower vulnerability and mild symptoms during the pandemic (Kopel et al., 2020; Salih et al., 2020; Shi et al., 2020).

Besides, the role of nutritious supplements, such as vitamins C, D, and Zinc, has shown promise in boosting immunity and reducing the risk of catching the virus (Chowdhury, 2020). Studies have revealed that the immunity function of an individual and other physiological factors about the disease severity influence the adoption of protective behaviors (Chiappelli, 2020). Different age groups may perceive the severity of COVID-19 differently; for example, older individuals are more vulnerable and cautious about preventive behaviors against the virus (Statsenko et al., 2021). These observations underscore the intricate interplay of various factors shaping individuals' susceptibility to and experiences with COVID-19. To address the risk factors in the Pakistani context and their interconnectedness with adopting preventive measures, we included a hypothesis and research question.

COVID-19 Vaccines

Vaccines against COVID-19 emerged as a crucial tool to combat the virus's transmission and severity. The countries actively developing vaccines against COVID-19 were the USA, the UK, China, and Russia. They developed several prominent vaccine brands, including Pfizer Inc. and BioNTech S.E., Moderna, Oxford-AstraZeneca, Sinopharm, and Sinovac (Mouffak et al., 2021). As reported by these companies, the Pfizer-BioNTech BNT162b2 vaccine boasts an efficacy rate of 95.0%, necessitating stringent transportation conditions at -70 °C. In contrast, with a 94.1% efficacy rate, the Moderna vaccine maintains stability for six months and requires fewer storage conditions at -20 °C. The Oxford-AstraZeneca AZD1222 vaccine requires a stable vector and can be stored at typical refrigerator temperatures. Russia's Sputnik V vaccine employs a two-vector approach with a storage temperature of 2-8 °C. On the other hand, the Chinese-developed Sinopharm BBIBP-Cor-V and Sinovac CoronaVac vaccines are conventional inactivated vaccines. BBIBP-Cor-V showcases an efficacy of 79.3% and can be transported and refrigerated at 2-8 °C While vaccination plays a significant role in disease mitigation, the effectiveness of individual vaccines varies across a spectrum (Rahman et al., 2021).

In Pakistan, free vaccines such as AstraZeneca, Sinopharm, and Moderna were available at public centers for the general public. Despite the positive efforts, challenges persisted, such as vaccine shortages, distribution hurdles, and storage complexities that frequently hindered public access to these vaccines (Junaidi, 2023). The administration of booster shots also faced variations in timing. National database and regulatory authority maintained records of vaccinated individuals, contributing to a comprehensive understanding of vaccination progress and impact in Pakistan. Even as COVID-19 vaccines are being administered, medical experts emphasize that essential preventive measures remain indispensable in curbing the disease's spread. Wearing masks, practicing social distancing, avoiding densely populated areas, and maintaining rigorous hand hygiene are vital strategies. These measures are crucial until medical science accomplishes widespread herd immunity across the global population (Junaidi, 2023). To investigate vaccine hesitancy, we included a research question (see section of research question).

COVID-19 Vaccination Hesitancy

COVID-19 vaccine reluctance is a worldwide issue, as evidenced by varying acceptance rates throughout regions and populations. This reluctance derives from historical difficulties such as trust in government and healthcare systems, access to information and education, and cultural and religious influences, all of which present significant challenges to public health efforts (Sallam et al., 2022).

According to Callaghan et al. (2020), as of June 2020, 31.1% of Americans were opposed to receiving the COVID-19 vaccine, with women, Blacks, and conservatives expressing particularly strong opposition. Similarly, Ruiz and Bell (2021) discovered lower acceptance rates, with 14.8% refusing and 23.0% undecided. Loomba et al. (2021)

found that by September 2020, only 54.1% and 42.5% of participants in the USA and the UK were willing to "definitely" take the immunization. Sallam's (2021) detailed investigation revealed global disparities, including lower acceptance rates in Africa, the Middle East, Russia, and some European countries.

Bangladesh has a high level of vaccine fear, with reported rates of 32.5%. Male gender, old age, marital status, tobacco use, political affiliation, no history of physical sickness, and low income all contribute to this reluctance (Ali & Hossain, 2021). Notably, concerns about potential side effects, uncertainty about efficacy, and doubts about the vaccine's Indian origin appear to be major reasons for rejection (Mahmud et al., 2021). In India, Chandani et al. (2021) found higher levels of reluctance across various races. Women are cautious at 38.0%, urban inhabitants at 40.0%, full-time or paid employees at 41.0%, and those with a university degree or above at 41.0%. Furthermore, 65.0% of people who voice vaccination concerns are apprehensive (Chandani et al., 2021). The study also revealed that people believing COVID-19 is not a serious disease are 66.0% less likely to acquire the vaccine. Furthermore, 37.0% of people without COVID-19 are suspicious of vaccines (Chandani et al., 2021).

Conspiracy theories assert that the COVID-19 virus was deliberately created to spread misinformation widely, exacerbating concerns about the safety and effectiveness of vaccinations. This has contributed to the proliferation of anti-vaccine sentiment (Muhammad et al., 2022). In this regard, Pakistan's health authorities employed calculated communicative strategies for confidence-building in vaccination acceptance. The government also established immunization centers in rural and urban localities for free vaccines (Muhammad et al., 2022). Despite early resistance, the vaccination strategy finally convinced people to accept vaccination.

Theoretical Framework

Effective communication is crucial during any crisis, particularly in public health emergencies. This study employed Timothy Coombs' crisis risk communication (CRC) theory, established in 1995, concentrating on 'priming' and 'behavioral control.' 'Priming' includes the media frequently debating a specific matter to persuade behavioral change, while 'behavioral control' refers to individuals familiarizing their actions based on new information (Conner, 2020; Eyitayo et al., 2022; Zarocostas, 2020).

Based on the mentioned theory, we scrutinized the impact of social media during the COVID-19 pandemic on shaping people's perceptions (priming) regarding life-threatening factors such as severity, immunity, and age. Furthermore, we investigated how individuals modified their behavioral patterns (control behavior) to adopt preventive measures in response to the media priming effect during the pandemic. Using CRC theory is crucial for our study because it helps us grasp how social media effectively shares information about risks. The following research questions and hypotheses provide a clear roadmap for us to investigate how social media influences people and to untangle the intricate link between the life-threatening nature of the COVID-19 pandemic and how individuals choose to take preventive measures.

H1. The impact of social media on individuals' awareness of COVID-19 is anticipated to be greater when juxtaposed with the influence exerted by traditional media channels.

RQ1. What is the differential impact of media consumption, specifically examining social media and traditional media, on shaping audience awareness of COVID-19?

RQ2. What is the prevailing societal context influencing the adoption of protective measures against COVID-19 among the general public?

H2. There exists a positive correlation between the perceived helpfulness of social media usage and the propensity of individuals to adopt preventive measures against COVID-19.

H3. Adoption of preventive measures against COVID-19 is contingent upon a multifaceted interplay of factors, encompassing the perceived severity of the pandemic, individual perceptions of immunity, and age as significant determinants.

RQ3. To what degree did individuals exhibit hesitancy towards COVID-19 vaccination, considering factors such as concerns, attitudes, and perceptions influencing their decision-making process?

RQ4. To what extent did individuals' express satisfaction with the government's management of the COVID-19 situation in Pakistan, considering factors such as communication strategies, policy implementation, and public health outcomes?

METHOD

This quantitative research delves into the impact of social media on the adoption of preventive measures during the COVID-19 pandemic in Pakistan, with a specific emphasis on the threatening factors associated with COVID-19. The study employs Timothy Coombs's CRC model as a framework to investigate the influence of social media exposure on individuals concerning information about the life-threatening risks posed by COVID-19 (priming). Additionally, the research explores how individuals adopted preventive measures (behavioral control) in response to information about the COVID-19 pandemic.

The study examines the information consumption habits of respondents regarding COVID-19 on social media during the pandemic. Additionally, the reliance on traditional media is considered for comparison and a broader context for understanding risk communication and adopting preventive behaviors throughout the pandemic. A stratified sampling technique was employed to gather data, and 363 respondents from the district of Rawalpindi participated in the study. This district was chosen due to its substantial population density, amounting to 5.406 million, according to the Pakistan Census of 2017. Notably, Rawalpindi experienced many positive COVID-19 cases during the study period in Pakistan, as documented by Noor (2022). The decision to focus on Rawalpindi was influenced by its proximity and convenience for data collection. The assumption was that social media users, particularly on Facebook, in Rawalpindi would have a higher frequency of COVID-19-related posts (Noor, 2022), contributing valuable insights into the local information scene during the pandemic.

Table 1. Characteristics of sample

Variable		n (%)
Gender	Male	209 (56.9)
	Female	154 (43.1)
Age	25-30	135 (36.8)
	31-35	108 (29.4)
	36-40	53 (14.4)
	41+	71 (19.0)
Education	10-year education	5 (1.4)
	12-year education	38 (10.4)
	14-year education	124 (33.8)
	16-year education	200 (54.5)
Income	Less than 50,000	182 (49.6)
	51,000-100,000	89 (24.2)
	101,000-150,000	36 (9.8)
	150,001+	60 (16.3)

Questionnaires & Survey Items

Media, sociology, psychology, and health experts validated our survey questionnaire, which was pre-tested for clarity and precision, and refined it based on expert and sample group feedback. Cultural sensitivity was a priority. Most questions used a 5-point Likert scale for attitudinal and behavioral concepts, with one as the lowest and five as the highest response. The questions items in the questionnaire were based on the following concepts.

Perceived Risk Factors

The survey questions explored different aspects of the risks associated with COVID-19, including how people see the seriousness of the pandemic, think about immunity, and consider their age. Drawing on Chiappelli's (2020) findings, we know that people take precautionary measures when they believe a serious health threat exists. Supporting this idea, studies by Shi et al. (2020) report that people are more likely to take preventive actions when aware of severe illness or reported fatalities from COVID-19. These results align with our research theory on 'CRC,' which guided our study. We included these specific risk factors in the survey to understand how people's perceptions of risk relate to their behaviors, especially in adopting preventive measures for COVID-19. Participants in our survey rated these factors on a 5-point Likert scale, where one meant the lowest rating, and five indicated the highest.

Preventive Measures

The survey included questions regarding individuals' adherence to measures to curb the spread of COVID-19. These preventive measures, as highlighted by WHO in 2020, include practices like social distancing, wearing masks, regular handwashing, sanitizing surfaces, adherence to general hygiene protocols, and the promotion of responsible coughing or sneezing habits, such as using the elbow or a disposable tissue.

Demographic Characteristics

The survey used demographic characteristics encompassing gender, age, income, and education. **Table 1** presents a comprehensive overview of the sample characteristics. Notably, a significant proportion of respondents fell within the 20-30 age bracket, predominantly identifying as male and possessing 16 years of education. Financially, the majority reported earning less than Pakistani Rupee 50,000 a month. The data further underscores that respondents predominantly relied on social media and television as their primary sources for COVID-19-related information.

Table 2. Reliability report

Variables	n	PR	FR
Social media helpfulness	4	0.65	0.71
Adoption of preventive measure	12	0.68	0.74
Perceived severity	3	0.72	0.76
Weak immune	2	0.71	0.73
Age factor	2	0.72	0.71
Government's handling	5	0.71	0.74
Vaccination	3	0.73	0.75

Note. n: Number o fitems; PR: Pilot reliability; & FR: Final reliability

Additional Question Items

Beyond the topics mentioned above, the questionnaire also incorporated inquiries about respondents' trust in government agencies regarding pandemic-related information, covering aspects such as food supply, restricted areas, testing, and vaccination centers. Participants were also asked about curative behaviors concerning the disease from both Islamic and scientific perspectives. The question regarding Islamic curative behaviors was posed about the prevalence of information on social media about the Islamic concept of pandemics and associated treatment procedures.

Reliability of Data

In **Table 2**, we used Cronbach's alpha to evaluate the questionnaire's internal consistency reliability, which included 34 major components but excluded demographic factors. The questionnaire, designed as a Likert scale with multiple-choice responses, was thoroughly tested to confirm its dependability. Before the full-scale dissemination, a pilot test was conducted with 30 conveniently selected Rawalpindi volunteers. During the pilot test, research indicated that two questions had Cronbach's alpha values lower than the allowed threshold of 0.7. Following this discovery, we actively adjusted and modified the questionnaire's quality. In the final form of the questionnaire, all items displayed internal consistency within the established criteria, with Cronbach's alpha scores ranging from 0.70 to 0.76. The finalized questionnaire has an average Cronbach's alpha of 0.73 (see **Table 2**). Notably, the changes made resulted in a significant improvement in the items' internal consistency. Shodiya and Adekunle (2022) recommend reliability ratings ranging from 0.70 to 0.85, citing this range as indicative of appropriate reliability for verifying the legitimacy of acquired data. As a result, the reliability scores reported in **Table 2**, with an average of 0.73, indicate high internal consistency across the survey items.

Overview of Analysis

To analyze the data for this study, we employed SPSS and applied both descriptive and inferential statistical methods to address the research questions and test the hypotheses. Primarily, we used descriptive statistics, including frequency and percentage distribution, and cross-tabulation on the variables to explain the overall trends in the phenomenon in the study sample. The inferential statistics we used were chi-square, t-test, ANOVA, Pearson correlation, regression, and path analysis tests to answer the research questions, test the hypotheses, and generalize the result on the study target population.

Table 3. Liner regression of media influence on COVID-19 awareness

Variable	B	Standard error	Beta	t	Sig.
Constant	17.944	0.960		18.689	.000
Influence of television	0.240	0.349	0.039	0.687	.492
Influence of radio	0.592	0.342	-0.092	1.732	.084
Influence of newspapers	0.587	0.340	-0.091	1.728	.085
Influence of Facebook	2.120	0.370	0.330	5.728	.000

Note. Dependent variable: COCID-19 awareness; R=.424, R-square=.180; Adjusted R-square=.168; Standard error=5.758, F-value=15.458; p=.000; Sig.: Significance

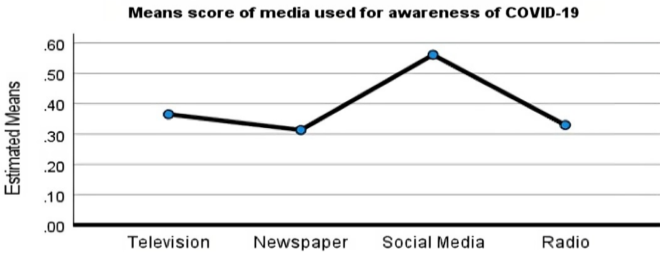

Figure 1. Public adherence to COVID-19 preventive measures (Source: Authors)

Table 4. Adoption of preventive measures for COVID-19 pandemic

	Stay home	Avoid public gathering	Wash hands	Use mask & sanitizer	Social distancing	Avoid meeting risk groups	Total
n	266	257	256	302	243	208	1,532
Percentage (%)	17.4	15.9	16.7	19.7	16.8	13.6	100

Table 5. Relationship between social media helpfulness & adoption of COVID-19 preventive measures

	Mean	Standard deviation	1	2	3	4	5	6
1. Social media helpfulness	1.44	.51875						
2. Avoid meeting risk groups	.7248	.44723	.044					
3. Regularly wash hands	.7003	.45876	.146**	.289**				
4. Avoid public gathering	.6975	.45995	.073	.232**	.398**			
5. Use of masks	.8229	.38228	.135**	.178**	.382**	.440**		
6. Social distancing	.6621	.47363	.122**	.282**	.476**	.483**	.408**	
7. Stay home	.5668	.49620	.152**	.286**	.532*	.430**	.415**	.515**

RESULTS

This study involves a comprehensive analysis of the hypotheses and the research questions, employing a combination of descriptive and inferential statistics.

H1. The impact of social media on individuals' awareness of COVID-19 is anticipated to be greater when juxtaposed with the influence exerted by traditional media channels.

Table 3 shows the analysis of the linear regression results supporting the hypothesis that the impact of social media on audience awareness of COVID-19 will be greater than that of traditional media. The overall model demonstrates statistical significance (F=15.458, p=.000), signifying a substantial relationship. The model accounts for 18.0% of the variance in audience awareness (R-square=.180). Social media influence (B=2.120, p=.000) was significant for audience awareness. In contrast, traditional media platforms such as television, radio, and newspapers did not significantly influence audience awareness. These findings increase our understanding of the dynamic media landscape and the diverse impact of different platforms on public health communication. In crisis risk health communication, social media emerges as a more potent influencer than traditional media due to its speed and ready availability.

RQ1. What is the differential impact of media consumption, specifically examining social media and traditional media, on shaping audience awareness of COVID-19?

Figure 1 answers question 1 in support of **H1** and examines audience exposure to various media platforms during the COVID-19 pandemic.

The data reveals a noteworthy disparity in mean scores among different media platforms. Specifically, the mean score for social media (0.5613) stands out significantly higher than those for other platforms, including television (0.3651), radio (0.3297), and newspapers (0.2262). The statistical analysis, employing the repeat ANOVA test, underscores the robustness of these observed differences. The obtained F-value of 35.684, coupled with a p-value less than 0.000, attests to the statistical significance of the disparities in audience exposure across diverse media channels.

RQ2. What is the prevailing societal context influencing the adoption of protective measures against COVID-19 among the general public?

Table 4 provides insights into the public adherence to various COVID-19 preventive measures. As evident from **Table 4**, 19.7% of respondents used masks and sanitizers, 17.4% reported staying home as a preventive measure, 16.8% maintained social distances, 16.7% adhered to regular handwashing, 15.9% avoided public gatherings to mitigate the risk of contracting the virus, and 13.6% showed the least concern by not avoiding meetings with high-risk groups.

In summary, **Table 4** reveals the overall adoption of COVID-19 preventive measures, highlighting masks and sanitizers as the most common at 19.7% and avoiding meetings with high-risk groups as the least reported at 13.6%.

H2. There exists a positive correlation between the perceived helpfulness of social media usage and the propensity of individuals to adopt preventive measures against COVID-19.

Table 5 presents the correlations between individuals' perceptions of social media helpfulness and their engagement in COVID-19 preventive measures. Beyond avoiding gatherings involving risk groups, social media exhibits a positive and significant influence on adopting various preventive measures against COVID-19. This suggests a widespread adoption of multiple behaviors among those who perceive social media as helpful.

Table 6. Multiple regression of influence risk factors & adoption of preventive behaviors

Model	B	SE	Beta	t-value	Sig.
Constant	3.422	.132		25.864	.000
Perceived severity	.313	.105	.156	2.974	.003
Week immune	.281	.113	.131	2.489	.013
Age factor	.094	.039	.122	2.397	.017
R	.256	.065			
R^2	.065				
F-value	8.460 & p<.000				

Note. Dependent variable: Adoption of preventive measures against COVID-19 & SE: Standard error

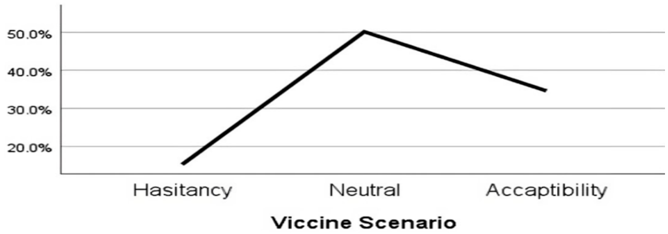

Figure 2. Vaccine hesitancy & acceptability scenario in Pakistan (Source: Authors)

Effect of Risk Factors & Adopting Behavior

H3. Adoption of preventive measures against COVID-19 is contingent upon a multifaceted interplay of factors, encompassing the perceived severity of the pandemic, individual perceptions of immunity, and age as significant determinants.

In **Table 6**, we present the results of a regression analysis examining the impact of COVID-19 risk factors, namely severity, immunity, and age, on individuals' adoption of preventive measures within society. **Table 6** reveals that the overall model is statistically significant (p<.000), indicating a meaningful relationship. Collectively, the predictors–severity, weak immunity, and age–account for 6.5% of the variance in the dependent variable. Each predictor demonstrates a statistically significant relationship with the dependent variable (p<0.05). The coefficients (B) signify the change in the dependent variable associated with a one-unit change in the respective predictor, while Beta represents the standardized coefficients. Despite these factors' statistical significance, the model's overall explanatory power remains modest at 6.5%. Other unexplored factors may also play a role in influencing preventive behaviors.

Vaccination landscape in Pakistan

RQ3. To what degree did individuals exhibit hesitancy towards COVID-19 vaccination, considering factors such as concerns, attitudes, and perceptions influencing their decision-making process?

Figure 2 illustrates the prevailing sentiments regarding vaccination in Pakistan. Notably, a predominantly positive attitude is observed among the populace, outweighing negative sentiments. This positive inclination is crucial for understanding the overall acceptability of vaccines in the country. A statistical validation through the chi-square test reinforces this observation, revealing a substantial association between positive attitudes and vaccine believability among the respondents. The test yielded a chi-square value of 67.232 with a significance level (p-value) less than 0.001.

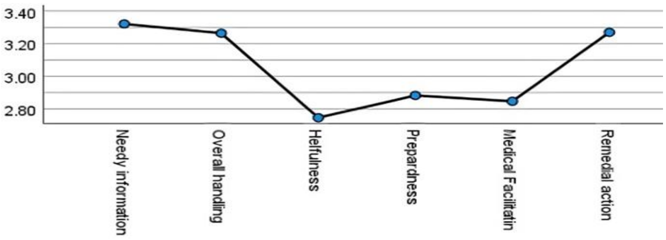

Figure 3. Government handling of pandemic (Source: Authors)

Government Handling of the Pandemic

RQ4. To what extent did individuals express satisfaction with the government's management of the COVID-19 situation in Pakistan, considering factors such as communication strategies, policy implementation, and public health outcomes?

Figure 3 depicts respondents' confidence in the government's handling of the pandemic situation in Pakistan. Notably, there is widespread satisfaction among the populace regarding the government's communication of essential information, implementation of remedial actions, and overall handling of the pandemic. However, it is crucial to highlight that despite the general satisfaction, the mean score for the government's assistance in solving people's difficulties in food, shelter, and providing treatment was relatively low. This indicates respondents' potential concern or dissatisfaction regarding the government's response to the pandemic. The ANOVA test results confirm a statistically significant association between the government's provision of essential information during the COVID-19 pandemic and the public's overall trust in this information. The high F-statistic of 5198.703, with a p-value less than 0.000, underlines the robustness and reliability of government-provided information.

DISCUSSION

Social Media Effect on COVID-19 Pandemic

This study underlines the influence of media on public response to the COVID-19 pandemic in Pakistan, highlighting a notable shift in audience preference towards social media over traditional mediums like television, radio, and newspapers. This transition can be attributed to the dynamic nature, diversity, and easy accessibility of social media, which strongly influence audience awareness and its relation with adherence to protective measures during the pandemic. Similarly, results found in the previous studies research of Aziz et al. (2022), Gozzi et al. (2020), Cinelli (2020), and Medina-Jimenez et al. (2022).

CRC theory, affixed in priming and behavioral control principles, demonstrated effectiveness in this study, as COVID-19 triggered a global health emergency that also affected Pakistan badly. The swiftness and immediacy of social media dissemination and its easy accessibility facilitated the individual during the COVID-19 pandemic have an impact on individuals' preventive behaviors. The importance of these findings extends to the potential for effectively leveraging social media in public health campaigns to promote and reinforce preventive behaviors during health crises.

The selected theoretical framework for this study aligns with the context of the COVID-19 pandemic. The swift dissemination and easy accessibility of crisis-related health information on social media have significantly impacted individuals' preventive behaviors in response to the pandemic. The significance of these insights lies in the potential for effective use of social media for public health campaigns in reassuring preventive behaviors during health crises.

Adherence to COVID-19 Preventive Measures in Pakistan

The study investigation of adherence to COVID-19 preventive measures reveals positive and negative aspects. The positive trend shows that a wide-range observation indicates a commitment to preventive measures. One positive tendency is the prevalent recognition of the importance of using masks and sanitizers as main preventive measures, reflecting a shared understanding of preventive measures in safeguarding against the virus. However, some grave areas underscore the influence of cultural factors in adherence to preventive measures. The noticeable challenge is a low preventive priority of avoiding contact with people, particularly those in high-risk groups.

Pakistani society is closely associated with regular religious congregations' cultural and social bonds and exceptional workplace dynamics, significantly determining these adherence patterns. During the pandemic, there were media reports that individuals continued to attend religious events such as Eid and Ramazan and pray regularly in the masques. These cultural and religious practices signal a crucial need for policy formulation to ensure public safety.

Moreover, discrepancies in adopting preventive behaviors were evident, especially among laborers and low-paid workers who consistently reported to the workplace during the pandemic. Their relatively lower adherence to preventive measures underlines the influence of socioeconomic factors, requiring a more insight and context-specific approach to future health crises.

To tackle these challenges and promote widespread adherence to the strategy, there is a need for comprehensive social and educational campaigns. These initiatives should particularly engage religious leaders, leveraging their influence to enhance awareness and compliance. Developing a strategic plan for workplace improvements is essential to better address and rectify issues during future health crises akin to the challenges posed by the COVID-19 pandemic.

Vaccination Scenario in Pakistan

The positive than negative attitude toward vaccine acceptance among Pakistanis is aligned with the acceptance rates in Ecuador, Malaysia, Indonesia, and China (97.0%), (94.3%), (93.3%), and (91.3%), respectively, as reported by Sallam et al. (2022). This widespread acceptance of vaccine attitudes in Pakistan encourages progressing public health initiatives in mitigating the spread of the COVID-19 pandemic. The effective social media campaign about the severity of the pandemic contributed to the positive vaccine acceptability.

Risk Factors & Adoption of Preventive Measures

Our path analysis confirmed the positive effect of the awareness of risk factors on adherence to preventive action against the COVID-19 pandemic. The support of hypotheses explains the effective use of social media in elaborating the risk factors related to COVID-19 in shaping individuals' commitment to preventive measures. The results are consistent with the previous research that individuals are more persuaded to take protective actions when perceiving the health threat as severe (Bish & Michie, 2010; Kopel et al., 2020; Shi et al., 2020).

Government Pandemic Response: Navigating Approval & Gaps

The government of Pakistan's handling of the pandemic encouraged. People generally showed a positive attitude toward the government's preparation for COVID-19. However, grave areas such as food supply, shelter, and healthcare raise concerns, causing public dissatisfaction. Policymakers in developing countries need to concentrate more on treating adjustments for impending health crises.

CONCLUSIONS

This study investigates Pakistan's response to the COVID-19 pandemic, emphasizing social media's pivotal role in shaping public behavior. The shift from traditional to social media is evident, highlighting its influence and user-friendly nature. Positive correlations exist between perceived social media helpfulness and the adoption of preventive measures. Despite cultural and socioeconomic challenges, encouraging adherence to preventive measures is observed. Favorable attitudes toward vaccination align with international acceptance rates, emphasizing effective communication strategies. The study contributes to CRC theory, exploring social media's impact on cognitive processes and behavior regulation in Pakistan's sociocultural context. Positive public sentiment towards preventive behaviors contrasts challenges in avoiding gatherings. The study reveals widespread acceptance of COVID-19 vaccination, supporting effective health efforts. While the government's pandemic management garners overall positive sentiment, concerns persist in essential areas. The multifaceted analysis advocates adaptive strategies, leveraging social media, addressing cultural nuances, and ensuring comprehensive public health and safety crisis management. These insights guide future communication strategies and crisis management, offering a holistic perspective on CRC.

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Ethics declaration: The authors declared that the study received approval from the Ethical Committee of Bahria University, Islamabad, on 10 December 2023 with approval code: 24356-2024. The authors further declared that the study does not involve patients' data or other sensitive issues. The data was obtained from the general public during the COVID-19 pandemic, mostly comprising demographic variables, adopting protective measures against the COVID-19 pandemic, assessing the effectiveness of social media use during the pandemic, and adaptive behaviors. However, consent was obtained for data gathering along with the questionnaire.

Declaration of interest: The authors declare no competing interest.

Data availability: Data generated or analyzed during this study are available from the authors on request.

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Research Article OPEN ACCESS

Factors affecting research motivation among lecturers in the Institute of Teacher Education

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ABSTRACT

Motivation to conduct research among lecturers is an important issue that needs to be addressed to ensure that the research culture at the Institute of Teacher Education (ITE) can be nurtured. This study was conducted to identify factors that influence research motivation among lecturers at ITE. This study uses a correlational study design involving a total of 271 lecturers. The selection of the sample is carried out by using a clustered random sampling method. Data was collected using a questionnaire adapted from previous studies. Statistical package for social science and SmartPLS version 3.0 software were used to analyze the data. Findings from the analysis that has been conducted shows that the efficacy belief factor (β=0.312, p<0.001) and institutional support (β=0.230, p<0.001) have influenced the intrinsic motivation to conduct research. Meanwhile, the efficacy belief factor (β=0.353, p<0.001) and institutional support (β=0.187, p<0.001) also influenced the extrinsic motivation to conduct research directly. Overall, the factors studied explained 21.4% and 21.8% of the variance in intrinsic and extrinsic motivation to conduct research among lecturers at ITE. The findings of this study can be used by various parties to improve the aspect of increasing research motivation among lecturers.

Keywords: research motivation, research self-efficacy, institutional support, intrinsic research motivation, extrinsic research motivation

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INTRODUCTION

Excellence in high-impact research and innovation is one of the elements contained in the Institute of Teacher Education (ITE) transformation plan 2016-2025 (Kementerian Pendidikan Malaysia [Malaysia Education Ministry], 2017). Therefore, Malaysia Institute of Teacher Education (MITE) has encouraged all lecturers to actively engage in research activities. Accordingly, the research aspect has been made one of the evaluation criteria and part of the lecturer's essential duties. This matter has been embodied in the task specification book issued by MITE, which has set one of the lecturer's task specifications to carry out research, innovation and produce writing as well as publishing and widely disseminating the results (Kementerian Pendidikan Malaysia [Malaysia Education Ministry], 2016).

Involvement in research activities is one of the best approaches to improve the professionalism of a lecturer (Hosseini & Bahrami, 2020). This is in line with ITE's vision, which is "*ITE leading excellence in teacher education.*" In order to produce quality teachers with a high level of professionalism, it is a must for every teaching staff or lecturer to also have a high level of professionalism. Therefore, research activities are seen as the best vehicle that can be used by MITE as an effort to improve the level of professionalism among lecturers.

An individual's tendency to engage in research activities is dependent on the level of research motivation he possesses (Peng & Gao, 2019). According to Stupnisky et al. (2019) research motivation can be divided into two categories, namely intrinsic research motivation and extrinsic research motivation. This is in line with the self-determination theory (SDT) introduced by Ryan and Deci (2000). They argue that the individual's motivation related to a particular task is caused by the satisfaction or failure to meet three basic psychological needs. First, people want to feel that their behavior is autonomous, in other words, "voluntary and regulated by themselves and not by others." A highly autonomous lecturer will feel empowered to make choices, follow their interests, and act willingly. Alternatively, a lecturer who lacks autonomy will feel pressured to engage in research.

Apart from autonomy, the second basic requirement is competence, which is the desire to interact effectively with one's environment. A lecturer's competence can be nurtured through the research-related challenges they face, as well as through feedback that encourages them to improve their self-efficacy. Next, the third individual need is a sense of relatedness, which is a positive relationship with other people who are important and have a sense of belonging. An organization made up of members who support each other and have good relationships with students tends to feel a strong sense of belonging (Stupnisky et al., 2019).

Based on SDT (Ryan & Deci, 2000), an individual's motivation can be divided into two types, namely intrinsic motivation and extrinsic motivation. In the context of this study, intrinsic research motivation refers to the motivation that arises within the lecturer himself to conduct research. The motivation is likely to appear if a lecturer thinks that the research activity carried out by him is pleasant, interesting and can give him personal satisfaction. For example, a lecturer feels very motivated to conduct research because he realizes the findings of his research are very valuable and important. While extrinsic motivation is influenced by external factors, for example a lecturer may feel motivated to carry out research because he is bound by the requirements of the task, or to fulfill the conditions of grants, scholarships and so on. Both types of intrinsic and extrinsic research motivation of ITE lecturers was measured in this study.

The motivation to conduct research among lecturers is an important factor that contributes to increasing their research productivity, especially related to the production of research publications in high-impact journals (Peng & Gao, 2019). Therefore, as a lecturer, they should always try to improve research motivation to ensure that they can produce quality publications. In addition, Hosseini and Bahrami (2020) also think that the level of research motivation possessed by a lecturer can contribute to an increase in the development of their professionalism.

However, it was found that the level of involvement of ITE lecturers with research-related activities such as writing journal articles and presenting research at the national and international level is very limited. This is based on the percentage of article publications and lecturer participation in seminars that have been organized. This scenario has somewhat hindered MITE's efforts to ensure that the quality of ITE lecturers is comparable to lecturers in public universities. In addition, it has raised questions about the factors that contribute to the lack of involvement of ITE lecturers in research-related activities at a higher level. Therefore, this study was conducted to identify the factors that influence the involvement of lecturers in research activities, especially from the aspect of motivation. Although there have been studies conducted related to research motivation, the number is very limited (Stupnisky et al., 2019). In addition, studies related to research motivation among university lecturers that talk about the level and factors that influence their motivation to conduct research are very few (Peng & Gao, 2019).

Research Objectives

1. To identify the level of intrinsic research motivation, extrinsic research motivation and research self-efficacy among lecturers at ITE.
2. To examine the influence of research self-efficacy and institutional support factors on research motivation among lecturers at ITE.

THEORETICAL BACKGROUND & RESEARCH MODEL

Studies related to research motivation have been carried out since the 1940s (Weiner, 1990). However, research related to research motivation was only carried out more widely starting in the 1990s. Among the earliest studies conducted related to research motivation are by Bailey (1999), Breen and Lindsay (1999), and Tien and Blackburn (1996). Most early research related to research motivation is focused on the influence of research motivation factors on research productivity and self-efficacy. The main theory that is often used as the basis for research related to research motivation is SDT.

Self-Determination Theory

The selection of SDT in this study is based on the appropriateness of the study context, which is the research motivation. SDT is a macro theory related to human motivation and personality related to natural psychological tendencies and needs. It is related to the motivation behind the choices made by a person without external influence. SDT focuses on the extent to which human behavior is self-motivated or self-determined (Ryan & Deci, 2000).

In the 1970s, research related to SDT has evolved from studies comparing intrinsic and extrinsic motivation, to studies related to the role of intrinsic motivation in individual behavior (Lepper et al., 1973). Then in the mid-1980s, Richard M. Ryan and Edward L. Deci wrote a book entitled "*Self-determination and intrinsic motivation in human behavior*" so SDT was formally introduced and accepted as a good empirical theory. Subsequently, since 2000, research that applies SDT to different fields in social psychology has increased.

The main research that led to the emergence of SDT was research on intrinsic motivation. According to Ryan and Deci (2000), intrinsic motivation refers to a person's tendency to start an activity because it is interesting and able to give satisfaction to him, compared to doing an activity for the purpose of getting something external (extrinsic motivation). A taxonomy of motivation has been explained based on the extent to which it is internalized. Internalization refers to the active effort to transform extrinsic motives into personally supported values and subsequently assimilate behavioral rules that were originally external in nature (Ryan, 1995).

Ryan and Deci (2000) later expanded their initial study by distinguishing between intrinsic and extrinsic motivation and presented three main intrinsic needs in self-determination. According to Ryan and Deci (2000), there are three basic psychological needs that motivate a person to initiate a behavior. These needs are said to be universal and natural needs, namely autonomy, competence and relatedness.

There are many studies related to research motivation that have been conducted using SDT as the main theory. Among the most recent studies that use SDT is the study by Stupnisky et al. (2019). The study has tested the role of motivational factors on the success and productivity of a lecturer. A total of 1,846 lecturers from 19 universities in the United States were involved in the study. Findings from the study show that the autonomy and competence factors have influenced a lecturer's research motivation. In addition, it was found that research motivation can also influence the research success of a lecturer.

In addition, a study conducted by Zhang et al. (2019) on 310 university lecturers in China found that the mastery goal factor has influenced the intrinsic and extrinsic motivation of a lecturer to conduct research. In addition, it was found that the leader's support factor has also influenced the intrinsic and extrinsic motivation of a lecturer to conduct research directly. Findings from their study also show that the self-efficacy factor does not affect both the intrinsic and extrinsic motivation of a lecturer to conduct research. However, a

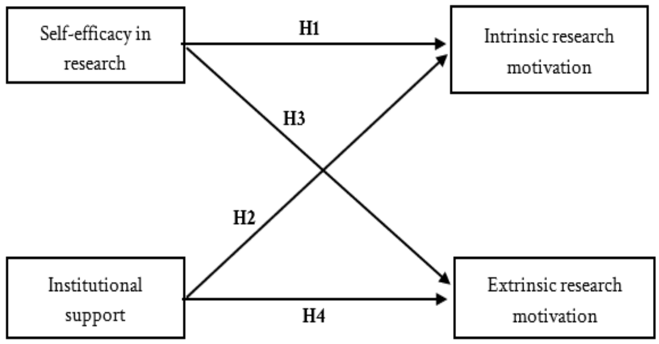

Figure 1. Research model (Source: Author)

previous study conducted by Kuo et al. (2017) also found that a person's self-efficacy factor can also affect research productivity. The study was conducted on 190 PhD students in counseling field.

Research Hypothesis

H1. Self-efficacy in research factor has a significant direct effect with intrinsic research motivation.

H2. Institutional support factors have a significant direct effect with intrinsic research motivation.

H3. Self-efficacy in research factor has a significant direct effect with extrinsic research motivation.

H4. Institutional support factors have a significant direct effect with extrinsic research motivation.

METHOD

Research Design

This study was conducted using a quantitative approach. A quantitative approach was chosen because this study involves testing hypotheses based on a specific theory that contains variables that are measured using numbers and analyzed using statistical procedures to determine whether the generalization of the theory's predictions is true. Therefore, based on the recommendations made by Cohen et al. (2011), a quantitative research approach is the most appropriate. The design of this study is in the form of correlation, which is to study important correlates that can explain variations in the dependent variable, which is research motivation.

Hypothesis testing is conducted based on data collected using a questionnaire. The unit of analysis of this research is the individual, limited to the lecturers currently serving in ITE campus, where each lecturer is considered as a data unit. **Figure 1** shows research model.

Population & Sample

In the context of this study, the study population consists of all lecturers currently serving at ITE. This study uses a clustered random sampling method. This method was chosen because this study was conducted on a population that involved a large area. Overall, the population for this study is 2,557 lecturers (n=2,557). Some of them have been used for pilot studies, namely 90 people, so the remaining population is 2,467 people. Based on the recommendations of Henseler et al. (2015), researchers who use the partial least squares modeling method in data analysis, the sample size is determined based on the maximum number of structural paths that lead to a specific latent variable. Determination of the total sample size made using G*Power 3.1 software (Erdfelder, 2009) found that for the effect size f^2=0.15 and the number of predictors=2, the appropriate sample number is 107 people. However, this study has involved a total of 271 sample.

Table 1. Summary of research instruments

Construct	n	Sources
Intrinsic research motivation	7	Hosseini and Bahrami (2020)
Extrinsic research motivation	5	Hosseini and Bahrami (2020)
Self-efficacy in research	6	Zhang et al. (2019)
Institutional support	4	Zhang et al. (2019)

Note. n: Number of items

Data Collection

After identifying the study population and sample, then the appropriate data collection method is planned to answer the research questions presented. There are two types of data collected in this study, namely data related to respondents' demographic information and data related to ITE lecturers' perceptions of factors that influence their research motivation. The data collection method used is to conduct a survey using a questionnaire. Before conducting the survey, first a set of questionnaires containing the information needed to answer the research questions was prepared.

Measures

The questionnaire used was adapted from a study conducted by previous researcher that is relevant to this study. Since the instruments used have met the aspects of validity and reliability, then the aspects of content validity have been met (Sanchez-Franco & Roldán, 2010). The original instrument for this study was taken from a previous study prepared in English, so the back to back translation method was used. Through this method, the instrument was translated into Malay and translated back into English (Cha et al., 2007). This process was assisted by two English and Malay language experts from ITE Tengku Ampun Afzan Campus. A discussion was held to ensure that the original meaning of the instrument did not change after being translated. **Table 1** shows summary of research instruments.

After generating items for an instrument, the validity and reliability aspect need to be examined (**Table 2**). The validity of this study refers to measuring what should be measured (Kerlinger, 1986). While the reliability of the study refers to the consistency of a measure and the stability of a measure over time (Cohen et al., 2011; Creswell, 2014). Among the forms of validity and reliability that must be met before the actual study is conducted are internal reliability, content validity, predictive validity and construct validity (Nunnally & Bernstein, 1994).

When using multiple measures for an individual construct, the researcher should take into consideration the extent to which the measures demonstrate convergent validity (Hulland, 2002). Hair et al. (2011) has stated that a composite reliability (CR) of 0.70 or above and an average variance extracted (AVE) of more than 0.50 are considered acceptable. The result of confirmatory factor analysis (CFA) stated in **Table 3** shows that all CR values are above 0.70 and AVE is all above 0.50. Therefore, based on CFA result obtained, we can conclude that convergent validity for this measurement model has been fulfilled.

Besides convergent validity, the researcher also needs to take into consideration about discriminant validity in order to make sure the items used to measure a certain construct are different with another construct in the model. According to Fornell and Larcker (1981) discriminant validity can be established by calculating the square root

Table 2. Reliability & validity analysis of research instruments

Construct	Item	IR-CA	Convergent validity		
			FL	CR	AVE
Intrinsic motivation	IM1	0.955	0.903	0.962	0.786
	IM2		0.902		
	IM3		0.860		
	IM4		0.933		
	IM5		0.873		
	IM6		0.839		
	IM7		0.892		
Extrinsic motivation	EM1	0.868	0.870	0.906	0.660
	EM2		0.861		
	EM3		0.836		
	EM4		0.638		
	EM5		0.835		
Self-efficacy	SE1	0.844	0.669	0.885	0.564
	SE2		0.660		
	SE3		0.779		
	SE4		0.811		
	SE5		0.787		
	SE6		0.786		
Institutional support	IS1	0.951	0.934	0.963	0.838
	IS2		0.942		
	IS3		0.941		
	IS4		0.926		
	IS5		0.830		

Note. IR-CA: Internal reliability (Cronbach alpha) & FL: Factor loading

Table 3. Correlation between constructs

Constructs	(1)	(2)	(3)	(4)
(1) Extrinsic research motivation	**0.813**			
(2) Institutional support	0.344	**0.916**		
(3) Intrinsic research motivation	0.581	0.369	**0.886**	
(4) Self-efficacy	0.436	0.445	0.414	**0.751**

of AVE. Besides that, Hair et al. (2011) also stated that discriminant validity also can be establish by assessing the cross loading and heterotrait-monotrait ratio of correlations value. For this study, only square root of AVE was used to assess the discriminant validity. If the square root of AVE for each construct is higher than its correlations with the other constructs, then the discriminant validity is established (Fornell & Larcker, 1981). As shown in **Table 3**, all of the square roots of AVE for each construct were higher than the correlations. Diagonal elements are the square roots of AVE for the corresponding construct.

DATA ANALYSIS

Descriptive Data Analysis

In the descriptive analysis, the statistical package program for the social sciences (SPSS) version 26 software was used. Descriptive analysis was used to obtain information such as mean values, percentages, standard deviations, normality tests, missing data analysis and multivariate analysis. Normality testing, missing data analysis and multivariate analysis are important to be performed before hypothesis testing analysis is conducted. Therefore, SPSS software is most suitable to be used to analyze the data.

SPSS software was also used to analyze the data to answer the first research question, which is related to the level of motivation and self-efficacy in research. In addition, to analyze the data related to the demographic information of the study respondents, SPSS software was also used. While for research hypothesis testing, smartPLS 3.0 software was used.

Table 4. Levels of intrinsic research motivation, extrinsic research motivation, & research self-efficacy (numberof smales [n]=271)

Constructs	Maximum	Minimum	Mean	SD
Intrinsic research motivation	5	1	3.93	0.807
Extrinsic research motivation	5	1	3.24	0.676
Self-efficacy in research	5	1	4.02	0.568

Partial Least Squares-Structural Equation Modeling Analysis

Partial least squares-structural equation modeling (PLS-SEM) analysis technique was created by Wold (1974) and became an alternative to the covariance-based structural equation model analysis (covariance-based SEM) that was developed by Jöreskog (1978). This study chose to use PLS-SEM approach because it is exploratory and not a theory testing, so the use of PLS-SEM is more appropriate (Hair et al., 2011).

FINDINGS & DISCUSSION

RQ1. What Is Level of Intrinsic Research Motivation, Extrinsic Research Motivation, & Research Self-Efficacy Among Lecturers at ITE?

Findings from the analysis that has been conducted show that the level of intrinsic research motivation and research self-efficacy are high (mean [M]=3.93, standard deviation [SD]=0.807) and (M=4.02, SD=0.568), respectively. Meanwhile, the level of extrinsic research motivation among lecturers at ITE is at a moderately high level (M=3.24, SD=0.676). **Table 4** shows the level of intrinsic research motivation, extrinsic research motivation and research self-efficacy among lecturers at ITE.

This finding clearly shows that although MITE has stipulated that all lecturers engage in research activities, the level of research motivation among lecturers is still at a moderate level, especially the aspect of extrinsic motivation. This situation is likely to occur because they feel that the research activities carried out are due to their own initiative and are not influenced by other parties. Findings from a study conducted by Zhang et al. (2019) showed that the extrinsic motivation factor is influenced by the mastery goal factor.

In addition, the level of extrinsic research motivation is also influenced by competency factors. Findings from a study conducted by Stupnisky et al. (2019) showed that competency factors have significantly influenced extrinsic research motivation. This situation explains that a person's level of competency to conduct research can influence their research motivation. Therefore, various parties need to play a role so that the level of competency in conducting research among lecturers can be increased. This can indirectly increase the level of research motivation among lecturers in the future.

RQ2. What Is Influence of Research Self-Efficacy Factors & Institutional Support on Research Motivation Among Lecturers at ITE?

Findings from the analysis of the structural model as attached show that (**H1**) research self-efficacy factor has a significant direct effect with intrinsic research motivation (β=0.312, $p<$ 0.001), (**H2**) institutional support factor has a significant direct effect with intrinsic research

Table 5. Hypothesis testing

Hypothesis	β	t	Result
H1. Self-efficacy→Intrinsic research motivation	0.312**	5.158	Yes
H2. Institutional support→Intrinsic research motivation	0.230*	3.164	Yes
H3. Self-efficacy→Extrinsic research motivation	0.353**	6.197	Yes
H4. Institutional support→Extrinsic research motivation	0.187*	2.861	Yes

Note: *p< 0.050 & **p<0.001

motivation (β=0.230, p<0.050), (**H3**) research self-efficacy factor has a significant direct effect with extrinsic research motivation (β=0.353, p<0.001), (**H4**) institutional support factor has a significant direct effect with extrinsic research motivation (β=0.187, p<0.050). Overall, the model explained 21.4% and 21.8% of the variance in intrinsic and extrinsic motivation to conduct research among lecturers at ITE.

As the findings of the study displayed in **Table 5**, it was found that intrinsic and extrinsic research motivation among lecturers is directly influenced by research self-efficacy and institutional support factors. The most dominant factor influencing intrinsic and extrinsic research motivation of lecturers is research self-efficacy. This is likely because lecturers feel that their efficacy to conduct research has increased their motivation to perform research. Continuous professionalism development programs and staff development training that are often organized are also likely to contribute to increasing the level of self-efficacy and research motivation among ITE lecturers. The findings of this study are contrary to the study conducted by Zhang et al. (2019) who found that the efficacy belief factor did not affect both intrinsic and extrinsic motivation. According to them, only the factors of mastery goals and institutional support affect the intrinsic and extrinsic research motivation of university lecturers in China.

In addition, it was found that institutional support factors can also influence the intrinsic and extrinsic research motivation of ITE lecturers. This is likely because the support from ITE management through the organizing of research workshops and seminars has successfully increased their motivation to conduct research. Findings from a study conducted by Zhang et al. (2019) also found that the leader's support factor has influenced the intrinsic and extrinsic motivation of university lecturers. **Figure 2** shows final research model.

Limitations & Further Research

Research related to research motivation is still relatively under-conducted, especially in the context of Malaysia. Based on the systematic literature review that has been carried out, it has been found that research related to factors influencing research motivation is very limited. Therefore, in the future, it is suggested that research related to factors influencing research motivation in Malaysia can be increased. In addition, it is also suggested that future research should test the role of mastery goal and performance goal factors as predictors of research motivation. Testing the role of mediators and moderators can also be conducted in future studies.

CONCLUSIONS

Findings from this study clearly show that the level of extrinsic research motivation among lecturers at ITE is at a moderate level. In addition, it was found that both factors, namely self-efficacy in research and institutional support, have influenced intrinsic and extrinsic research motivation. The self-efficacy in research factor was found to

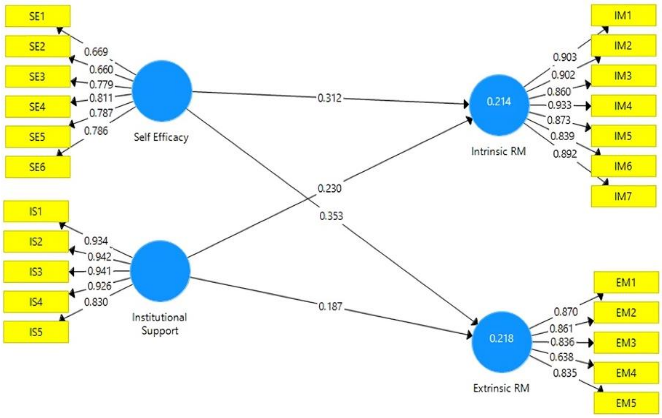

Figure 2. Final research model (Source: Author)

have a greater influence than institutional support. Overall, these two factors accounted for 21.4% and 21.8% of the variance in intrinsic and extrinsic motivation to conduct research among lecturers at ITE. This study has also made a great contribution to stakeholders because it is able to report empirical data that can be used to formulate policies related to research motivation.

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Data availability: Data generated or analyzed during this study are available from the author on request.

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Relationship between moral intelligence and corruption tolerance among public sector employees: Does life satisfaction matter?

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ABSTRACT

Corruption tolerance may encourage corruption in public sector employees and reduce their willingness to engage in whistleblowing or support anti-corruption crusades. Though previous studies have shown that corrupt tendencies may reduce with morality and life satisfaction, there is a need to investigate the level at which corruption tolerance (which may be an important variable in whistleblowing) is related with moral intelligence and whether life satisfaction moderates the relationship. Using a cross-sectional survey, 495 public sector employees (207 males; 288 females), whose ages ranged between 21 and 60 years ($mean_{age}$ = 38.39; standard deviation = 7.46), were selected across 7 ministries in Nigeria. The participants responded to measures of corruption tolerance, moral intelligence, and life satisfaction. Results of the hierarchical multiple regression indicated that moral intelligence and life satisfaction had a significant joint influence on corruption tolerance. Corruption tolerance significantly reduced as employees' level of moral intelligence increased and as they became more satisfied with important aspects of their life. Results of the moderation test indicated that life satisfaction significantly increased the level at which moral intelligence reduced corruption tolerance; leading to 18% further reduction in corruption tolerance. Moral intelligence and life satisfaction reduced employees' tolerance for corruption. In order to reduce tolerance for corruption, public sector organizations, in conjunction with relevant agencies, should design and implement psychological programs that would help employees manage their moral intelligence and life satisfaction.

Keywords: corruption, life satisfaction, morality, employees, Nigeria

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INTRODUCTION

Corruption, generally conceptualized as the misuse of position or authority for personal gain at the expense of others and against the prevailing rules, regulations, and ethical principles (Balán, 2011), has received considerable research attention in recent years (Bobkova & Egbert, 2012). This may be because corruption and its pervasiveness have been associated with low organizational, national, and individual well-being (Ayamba, 2019; Li & An, 2019; Ojukwu & Chukwuma, 2018; Tay et al., 2014). Studies have linked the level of pervasiveness of corruption in public and private sector establishments (especially in developing countries) with nature of organization and management of resources (Fan et al., 2009; Gorsira et al., 2018), cultural and value orientations (Getz & Volkema, 2001).

In two separate reviews of the literature on corruption, Abraham et al. (2018) and Julián and Bonavia (2020) submitted that anti-corruption drives may be more effective if energies are not expended solely on legal framework to fighting corruption. This is because individuals respond differently to corruption and its environment (Vera, 2019). Therefore, such individual differences and corruption-promoting environment (Clarke & Xu, 2004; Olken, 2009; Olken & Pande, 2012; Rabl, 2011) must be effectively captured in anti-corruption efforts. Research, which focus how moral intelligence and life satisfaction connect with corruption tolerance, may be an important step in the quest to further comprehend the individual and psychological factors underlining corruption and anti-corruption activities, especially among public sector employees.

Corruption tolerance, the act of condoning, ignoring or indirectly supporting corrupt acts (Chang & Kerr, 2009), can also dampen employees' whistleblowing drive and reduce their inclination to supporting anti-corruption activities. The danger inherent in corruption tolerance is that employees may perceive a widespread tolerance for corruption as an indirect way of encouraging and supporting corruption in the workplace (Manzetti, 2000). A high level of corruption tolerance may, therefore, "force" more employees to accept corruption and continuously set a new norm of reacting to corruption; thereby creating lower moral standard that tolerates corruption the more.

The current study is situated within Bandura's (1991) social cognitive theory of moral thought and action. The theory posits that moral thoughts, actions, and affective self-reactions develop through intricate and bi-directional interactions with the moral environment, which mold the individual's moral conduct through the application of multi-dimensional ethical principles and their associated rewards and punishments (Bandura, 1991). Affective self-reactions to moral situations are selectively activated or disengaged by the individual (Bandura, 1991) in order to cope with moral and social anxieties associated with inability to meet subjective goals and aspirations through morally acceptable corridors. Therefore, corruption may also become pervasive if majority of employees tolerate it by selectively activating or disengaging their affective self-reaction to corruption based on whether corruption would jeopardize or enhance the achievement of subjective goals and aspirations.

Manzetti (2000) submitted that high level of corruption tolerance encourages corruption and makes it widespread, socially accepted, and condoned. Corruption tolerance may also heighten employees' willingness to engage in corruption (Alvarez, 2015). This implies that corruption tolerance may encourage corruption, which in turn may promote higher levels of corruption tolerance. Against this background, breaking the mutual link between corruption tolerance and corruption may require further understanding of how individual factors (e.g., moral intelligence) discourage corruption tolerance and the level at which subjective appraisal of the extent to which present life condition met personally set standard (life satisfaction). This study was, therefore, designed to investigate the extent to which moral intelligence predicts corruption tolerance and how life satisfaction moderates the relationship.

Moral Intelligence and Corruption Tolerance

Moral intelligence is conceptualized as the ability to use universal ethical principles to differentiate wrong from right and apply such distinctions to guide one's intentions, goals, beliefs, values, and actions, in relation to issues, other persons, and situations (Mohammadi et al., 2020). Moral intelligence is reflected in and epitomizes the principles of compassion, integrity, forgiveness, and responsibility (Lennick & Kiel, 2005). Compassion refers to the capacity to passionately pay attention to and be concerned about the welfare and well-being of others (Toprak & Karakus, 2018). The principle of forgiveness is wrapped in the deep understanding and the ability to encourage the understanding of the proneness of others to errors and mistakes; and, on the basis of that tolerate others and show clemency (Martin & Austin, 2010). Integrity is the outcome of the harmony between an individual's word and action that mirrors the right principles, beliefs, and values (Mohammadi et al., 2020).

Responsibility, as a component of moral intelligence, refers to the keen feelings of obligation to help and serve others, be accountable and responsible for the consequences of one's mistakes, failures in decisions, and actions (Lennick & Kiel, 2005). Mohammadi et al. (2020) submitted that moral intelligence, though less inherent, is largely learnt and developed through formal and informal methods in the social environment. In the same vein, employees can also learn, develop, and apply inappropriate and selfish principles that fail to distinguish between right and wrong in their intentions, goals, beliefs, and values that hurt the society, the organization, and others at work.

In a cross-national study, which comprised 122 students (46 Indonesians, 50 Polish, and 26 Americans), Wankel et al. (2011) reported that the ranking of participants' countries on the corruption perception index (CPI) significantly reduced as participants' scores on the measure of moral intelligence increased. Though this study can be criticized for its sample size and the fact that CPI may not directly reflect corruption tolerance level, its outcomes are an indirect pointer to the possible connections of moral intelligence and moral decision with corruption tolerance.

In taking moral decisions employees may also be caught in the dilemma of acting for the benefit of self or others. This may determine whether or not employees would tolerate corruption to protect the interest of self or others (Dungan et al., 2014). The level of perceived ethical disposition of leaders in the organization may also direct employees' moral decision and determine the level at which they tolerate or engage in corruption. Manara et al. (2020) found that corruption reduced significantly as employees perceived their supervisors' behaviors to be guided by ethical principles.

Apart from the perceived moral integrity of supervisors and leaders, the moral integrity of employees may also determine whether or not they would behave in a corrupt or non-corrupt manner. For example, Wahyuni et al. (2015) investigated the connections of anti-corruption behavior with religious orientation, personality characteristics, organizational climate and moral integrity. The participants were 203 civil servants in Indonesia. They found that moral integrity exerted the greatest influence on anti-corruption behavior (other variables, except religious orientation, which exerted minimal influence, were not related with anti-corruption behavior); with individuals who were high on moral integrity behaving less corruptly compared with those with low moral integrity.

Employees with high moral intelligence, compared with those that have low moral intelligence, may be committed to higher moral standards and exhibit lower level of corruption in the discharge of their duties. Tanner et al. (2022) tested, in a 2-step experimental study involving 225 students at a metropolitan business school in France, the extent to which resistance to corruption (opposite of corruption tolerance) is depended on moral commitment. They found that moral commitment, as reflected in integrity and honesty-humility, led to high resistance to corruption. Against the backdrop of the reviewed studies, it was hypothesized that:

H1: Moral intelligence will significantly predict corruption tolerance in such a way that corruption tolerance reduces as moral intelligence increases.

Life Satisfaction and Corruption Tolerance

Life satisfaction is defined as the personal assessment of how well one's present condition approximates his or her subjective goals and aspirations (Diener et al., 1985; Pavot & Diener, 2008; Zheng et al., 2016). Ogungbamila and Ojogo (2020) submitted that the extent to which the outcome of such cognitive and emotional assessments reflects and are in consonance with the person's subjective goals and aspirations, would indicate the level at which he or she is satisfied with life. Based on the outcome the subjective evaluation of their present condition of life, those who react negatively or hold unpleasant feelings towards life may engage in activities that are targeted at improving the current state of affairs or creating opportunities for meeting their subjective goals and aspirations (Ogungbamila & Ojogo, 2020).

When employees, who are unsatisfied with life, attribute their present condition to corruption or individuals who engage in corruption (Tay et al., 2014), they may also become intolerant of corruption and also engage in activities that frustrate corruption, in order to create the morally acceptable and needed conditions to meeting their subjective goals and aspirations (Ogungbamila & Ojogo, 2020). However, such employees may also be tolerant of corruption if they feel that corruption would provide the needed opportunities of meeting their subjective standard faster, especially when they can easily trade off some moral burdens (Dungan et al., 2014) using neutralization techniques (Ogungbamila, 2017).

There are limited studies on the connection of corruption tolerance with life satisfaction. This may be due to the fact that corruption tolerance is relatively new in literature (Chang & Kerr, 2009; Alvarez, 2015). Therefore, studies on the relationship of life satisfaction with corruption, attitude towards corruption or corrupt tendencies may serve as indirect indicators of the possible relationship between life satisfaction and corruption tolerance.

In a cross-national study that compared 29 transition countries in Central and Eastern Europe and five countries in Western Europe on life satisfaction and corruption, Amini and Douarin (2020) reported that life satisfaction reduced significantly as corruption became pervasive. Pervasiveness of corruption may reflect the fact individuals highly condoned, supported, and tolerated corruption (Keller & Sik, 2009), which might have adversely affected their level of life satisfaction. This may be because corruption adversely affects the equitable distribution of resources and opportunities as well as encourage the diversion of the resources that are meant for critical areas of human and national development for personal gains (Keller & Sik, 2009).

Ogungbamila and Ojogo (2020) investigated the relationship between life satisfaction and corrupt tendencies of 285 employees that were selected across two large public sector organizations in Nigeria. They reported that corrupt tendencies significantly reduced as employees became more satisfied with life. Incidentally, the finding of this study could be an indication that the employees who were unhappy with life might have shown preference for corruption as a road to providing opportunities for meeting their subjective goals and aspirations. Such employees may also support or be tolerant of corruption if the proceeds of corruption are or would be beneficial to them or relevant others in the short or long run.

However, if such employees attribute their unsatisfactory life to specific and general corrupt acts of others, especially if such corrupt acts are injurious to their well-being (Li & An, 2019), they may be motivated to frustrate and be intolerant any act of corruption. In essence, corruption tolerance may reflect in employees' perception of whether or not corruption prevents them from meeting the subjective standards they set in important domains of their life. At this level, the employees who did not attribute their low level of life satisfaction to corruption may feel justified to trade-off their moral principles (Dungan et al., 2014) and might feel *morally compelled* to support corruption. Based on this backdrop, it was expected that:

H2: Life satisfaction will significantly predict corruption tolerance in such a way that corruption tolerance reduces as life satisfaction increases.

H3: Life satisfaction will significantly moderate the relationship between moral intelligence and corruption tolerance such that life satisfaction will further enhance the way moral intelligence reduces corruption tolerance.

METHOD

Design and Participants

This cross-sectional survey involved 495 public sector employees (male = 207 or 41.8% and female = 288 or 58.2%). They were sampled from 7 Federal Ministries in Nigeria. Their ages averaged 38.39 (standard deviation [SD] = 7.46) with a range of 21 and 60 years.

The participants varied in terms of academic qualification. Fifty-three (10.7%) of the participants had up to ordinary level certificate; 102 (20.6%) had either Nigeria certificate in education or national diploma; 246 (49.7%) had either higher national diploma or first degree; and 94 (19%) had postgraduate degree. In the case of marital status, their responses showed that 114 (23%) of them were single; 348 (70.3%) were married; 12 (2.4%) were divorced; 10 (2%) were separated from their spouses; and 11 (2.2%) lost their spouses to death. In terms of religious affiliation, 352 (711%) were Christians; 119 (24%) were Moslems; and 24 (4.8%) of them were affiliated to other religions. The participants had spent an average of 10.51 years (SD = 6.54) on the job; with a range of 2 to 34 years.

Measures

Moral intelligence was measured with moral competency inventory (MCI). This measure, originally referred to as moral competency index was developed by Lennick and Kiel (2005) to assess the extent to which the thoughts and actions of individuals, including employees, reflect the application of the moral principles of integrity, responsibility, forgiveness, and compassion. This 40-item scale, which had four subscales (integrity = 10 items; responsibility = 10 items; forgiveness = 10 items; and compassion = 10 items), was predicated on a five-point Likert scale (1 = never; 2 = infrequently; 3 = sometimes; 4 = in most situations; and 5 = in all situations). Sample items include: "My friends and co-workers know they can depend on me to keep my word" (integrity); "I spend a significant amount of time providing resources and removing obstacles for my co-workers" (responsibility); "I am able to "forgive and forget" even when someone has made a serious mistake" (forgiveness); and "I am able to deliver negative feedback in a respectable way" (compassion).

Lennick and Kiel (2005) did not provide clear psychometric properties for the original scale. Martin and Austin (2010) and Toprak and Karakus (2018) provided elaborate psychometric properties for the scale. Martin and Austin (2010) reported that the MCI is largely valid and reliable in terms of factor, content, convergence, discriminant validity properties with some level of reservations. However, Toprak and Karakus (2018) submitted that the reservations noted by Martin and Austin might be connected with the fact that their analyses were not done in strict consonance with Lennick and Kiel's (2005) conceptualization and dimensionality of moral competency. Using Lennick and Kiel's (2005) dimensions and version of the scale, Toprak and Karakus (2018), reported that subscales of MCI had Cronbach's alpha that ranged from .70 (compassion) to .79 (integrity). The overall scale had .89 and .80 Cronbach's alpha and Spearman-Brown reliability coefficients, respectively.

With the present sample, the Cronbach's alpha of the four dimensions of MCI were .74 (integrity), .76 (responsibility), .72 (compassion), and .75 (forgiveness). The overall scale had a Cronbach's alpha of .82. The present study was designed to assess employees' level of moral intelligence, rather than the dimensions of it. Therefore, each participant's overall score on MCI was used in the current study. Scores on MCI were interpreted in such way that scores that were up to or higher than the mean reflected high level of moral intelligence while scores that were lower than the mean showed that the employee had low level of moral intelligence.

Life satisfaction was assessed with Diener et al.'s (1985) satisfaction with life scale (SWLS). The 5-item scale focused the participants' subjective assessment of the extent to which they were satisfied with their present state of affairs in relation to the personal standard they had set for themselves. SWS was rated on a 7-point scale (1 = strongly disagree; 2 = moderately disagree; 3 = slightly disagree; 4 = neither agree nor disagree; 5 = slightly agree; 6 = moderately agree; and strongly agree = 7). Sample items included: "The conditions of my life are excellent" and "I am satisfied with my life". SWLS had 2-month test re-test and coefficient alpha reliability values of .82 and .87, respectively (Diener et al., 1985). Ogungbamila and Ojogo (2020) reported a Cronbach's alpha of .89 for a Nigerian sample. With the present sample, SWLS had a Cronbach's alpha of .86. Scores on SWLS were interpreted such that life satisfaction increased as participants' scores on the scale increased.

Corruption tolerance was measured using corruption tolerance inventory (CTI) (**Appendix A**). In developing the CTI, 25 items were generated based on a focused group discussion with 4 employees (private sector = 2 and public sector = 2) on how and why individuals condone corruption in the workplace.

In a pilot study, the initial items of the CTI, which were rated on a 6-point scale (0 = not at all, 1 = a little, 2 = moderately, 3 = quite often, 4 = most of the time, and 5 = always), were administered with Ogungbamila and Udegbe's (2014) corrupt tendencies scale (CTS) to 123 public sector employees (73 males and 50 females) who had spent a minimum of 10 years on job. This major criterion was used in order to ensure that the participants had had opportunities to witness, frown at, punish or report corruption in the workplace.

The results of the item analysis indicated that 4 out of the 25 items were not valid. When the 4 items were deleted, the Cronbach's alpha of the CTI increased from .58 to .74. Consequently, subsequent analyses on the scale were based on the 21 valid items. Exploratory factor analysis with direct oblimin rotation was also performed on the scale. The explained variance showed that the scale had one factor with 57.4%. A concurrent validity test was performed on the CTI by correlating its total score with the total score on CTS. This was because CTI and CTS appeared to measure similar behavior. Consequently, those who show high tendencies of engaging in corruption as measured by CTS may also be more tolerant of and unwilling to punish or report corruption. Results showed that CTI had a positive significant relationship with CTS [r (121) = .47, p < .05].

The final 21-item CTI were used in the main study to measure the extent to which employees condoned corruption or were lenient with those who engage in corruption. The final CTI had a Cronbach's alpha of .87. Sample item of the CTI included: "I think others describe me as someone who condones wrongdoing" and "I feel upset when others try to cover up corruption" (reverse scored). Scores on the CTI were interpreted in such a way that scores that were up to or higher than the mean indicted that the employee was tolerant of and condone corruption while score that were lower than the mean showed that the employees did not condone corruption.

Procedure

The 26 federal ministries in Nigeria were listed in alphabetical order. Table of random numbers was used to select 7 ministries, which represented 26.9% of the 26 ministries. Permission to conduct the study was obtained from heads of the selected ministries after the purpose of the study had been duly explained. In most of the selected ministries, the head of the unit assigned a staff who ensured that employees freely participated in the study. The aim and nature of the study were duly explained to all potential participants, and they were assured that the study had no adverse physical or psychological effect. They were assured that their responses would be confidential and could not be traced to them. They were also told that they were free to participate in or withdraw their participation from the study at any time because the study had nothing to do with promotion, other work-related benefits or punishments.

Copies of the questionnaire were distributed to the respondents who showed willingness to participate in the study. Data collection spanned 3 weeks. Out of the 500 copies of the questionnaires that were administered, 495 were retrieved and found usable for analysis. This yielded a 99% response rate.

RESULTS

Test of Relationships Among the Variables

All the categorical variables were coded. In order evaluate the type of relationships that existed among the socio-demographic and psychological variables, Pearson product moment correlation was used to analyze the data. The mean and standard deviation scores of some of the variables were also calculated. The results are presented in **Table 1**.

The results in **Table 1** show that there was a significant negative relationship between moral intelligence and corruption tolerance [r (493) = –.53 p < .001]. This implies that as the level of moral intelligence of public sector employees increased, they became intolerant of corruption. Similarly, employees' tolerance for corruption significantly reduced as they became more satisfied with life [r (493) = –.42, p < .001]. Life satisfaction significantly increased with moral intelligence [r (493) = .31, p < .001].

In case of the socio-demographic variables, as employees increased in age, they became less satisfied with life satisfaction [r (493) = –.10, p < .05] but more tolerant of corruption [r (493) = .11, p < .05]. Gender was not significantly related to life satisfaction and corruption tolerance. This implies that public sector employees were satisfied with life and tolerant of corruption irrespective of their gender. There was no significant relationship between marital status and life satisfaction. However, marital status had significant positive relationship with corruption tolerance [r (493) = .09, p < .05]. Religious affiliation was not significantly related with life satisfaction, but it had a significant negative relationship with corruption tolerance [r (493) = –.14, p < .01]. Life satisfaction significantly increased with academic qualification [r (493) = .09, p < .05]. However, corruption tolerance reduced with academic qualification [r (493) = –.13, p < .05]. This shows that the more educated a public sector employee was the less tolerant of corruption he or she became. Life satisfaction and corruption tolerance were not significantly related to job tenure.

Table 1. Mean, standard deviation, and inter-variable correlations

Variables	1	2	3	4	5	6	7	8	9
Age	1								
Gender	−.09*	1							
Marital status	.25**	.15**	1						
Religious affiliation	−.01	−.05	.23**	1					
Academic qualification	.23**	−.08	.06	−.04	1				
Job tenure	.83***	−.11*	.21**	.01	.09*	1			
Moral intelligence	.03	−.05	.04	.05	.02	.09*	1		
Life satisfaction	−.10*	−.01	−.03	.05	.09*	−.05	.31***	1	
Corruption tolerance	.11*	.02	.09*	−.14**	−.13**	.04	−.53***	−.42***	1
Mean	**28.39**	-	-	-	-	**10.51**	**64.89**	**15.11**	**79.37**
Standard deviation	**7.46**	-	-	-	-	**6.54**	**4.50**	**4.45**	**9.24**

Note. **p* < .05. ***p* < .01. ****p* < .001. *N* = 495. Gender was coded as follows: male 0, female 1. Marital status was coded as follows: single 1, married 2, divorced 3, separated 4, and widowed 5. Religious affiliation was coded as follows: Christianity 1, Islam 2, and other religious affiliation 3. Academic qualification was coded as follows: up to ordinary level certificate 1, Nigeria certificate in education or national diploma 2, higher national diploma or first degree 3, and postgraduate degree 4.

Test of Hypotheses 1 to 3

Hypotheses 1 to 3 were tested with a 3-step hierarchical multiple regression analysis. It involved three regression models. In the first model, the socio-demographic variables were regressed on corruption tolerance. In the second step of the analysis (model 2), the independent effects of moral intelligence and life satisfaction were added to model 1. Finally, the moderation effects of life satisfaction on moral intelligence were added to the model in the third step of the analysis. The results are shown in **Table 2**.

As indicated in **Table 2**, all the socio-demographic variables, except gender and job tenure, were significantly related to corruption tolerance. All the socio-demographic variables contributed 6% to the observed changes in corruption tolerance in public sector employees (R = .24, R^2 = .06, F = 4.71, p < .001). At the individual level, employees' tolerance for corruption significantly increased with age (β = .16, t = 3.93, p < .01). Marital status had a significant influence on corruption tolerance with employees who were married or had been married (divorced, separated, and widowed) being more tolerant of corruption than those who were single (β = .11, t = 2.21, p < .05). Religious affiliation also exerted a significant influence on corruption tolerance with those who were affiliated to Christianity showing more tendency of overlooking corruption than those who were affiliated with Islam or other religions (β = −.15, t = 3.42, p < .01). The more educated public sector employees were the more tolerant of corruption they tended to be (β = .09, t = 2.01, p < .05).

Since the majority of the socio-demographic variables were significantly connected with corruption tolerance, it was important that a multi-collinearity test was conducted on the data. Results showed that the variables had *tolerance* scores that ranged between .29 (gender) and .94 (age). According to Berk (1977) and Yoo et al. (2014), a *tolerance* score that is less than 1.00 indicates that no multi-collinearity problem exists among the variables.

In order to test hypotheses 1 to 2, the influence of moral intelligence and life satisfaction were added to the regression model in step 2 of the analysis. The addition of the two variables led to 9% changes in the level of corruption tolerance in public sector employees (R = .30, R^2 = .09, ΔR^2 = .03, F = 6.23, p < .001). Public sector employees became less tolerant of corruption as their level of moral intelligence increased (β = −.36, t = 4.78, p < .001). Similarly, as public employees became more satisfied with important aspects of their life; they became less inclined to condone corruption (β = −.29, t = 4.02, p < .001). These results provided evidence to support hypotheses 1 and 2.

Hypothesis 3 was also supported by the results in **Table 2**. The addition of the cross-product of moral intelligence and life satisfaction to the regression model in step 3, led to 18% reduction in the level at which public sector employees condoned corruption (R = .43, R^2 = .18, ΔR^2 = .09, F = 8.20, p < .001). Life satisfaction significantly moderated the relationship between moral intelligence and corruption tolerance in such a way that when employees lived in accordance with universal ethical and moral principles and their current state of living approximated their subjective standard, they tended to frown at and became intolerant of corruption (β = −.45, t = 6.11, p < .001). These results provided support for the position of hypothesis 3.

DISCUSSION

Corruption tolerance may increase the prevalence of corruption in the workplace, especially if employees perceive that the environment created by widespread corruption tolerance has adversely affected the manifestation of high moral principles. The level at which employees condone corruption may also depend on whether or not they belief that corruption has reduced or may enhance the opportunities of meeting their subjective goals, aspirations, and well-being. This study, therefore, tested the extent to which moral intelligence predicts corruption tolerance and how life satisfaction moderates the relationship.

True to the expectations of hypothesis 1, corruption tolerance reduced with moral intelligence. This result reflected the findings of Tanner et al. (2022) and Wahyuni et al. (2015). The authors reported that individuals became less tolerant of corruption and were less likely to behave in corrupt manners as their level of moral commitment increased. This implies that employees who were morally upright might have perceived corruption and the tolerance of it as a moral transgression that should not be condoned. Those who scored low on the measure of moral intelligence might have supported or showed aversion to reporting corruption and punishing corruption maybe because they did not believe that a corruption-free workplace could enhance their well-being.

The results in **Table 2** provided support for hypothesis 2, which proposed that life satisfaction would have an inverse relationship with corruption tolerance.

Table 2. Summary of hierarchical multiple regression showing the influence of moral intelligence and life satisfaction on corruption tolerance

Models	β	t	R	R^2	ΔR^2	F
Model 1 (socio-demographic variables)	-	-	.24	.06	.06	4.71***
Age	.16**	3.93**				
Gender	.003	.07				
Marital status	.11*	2.21*				
Religious affiliation	−.15**	−3.42**				
Academic qualification	.09*	2.01*				
Job tenure	−.01	−.55				
Model 2 (predictor variables)	-	-	.30	.09	.03	6.23***
Age	.11*	2.34*				
Gender	.00	.002				
Marital status	.08	1.03				
Religious affiliation	−.10*	−2.45*				
Academic qualification	.07	0.99				
Job tenure	−.00	−.001				
Moral intelligence	−.36***	−4.78***				
Life satisfaction	−.29***	−4.02***				
Model 3 (moderator variable)	-	-	.43	.18	.09	8.20***
Age	.10*	2.23**				
Gender	.00	.001				
Marital status	.07	.86				
Religious affiliation	−.09*	−2.00*				
Academic qualification	.06	.78				
Job tenure	−.00	−.001				
Moral intelligence	−.31***	−4.29**				
Life satisfaction	−.27***	−3.89***				
Moral intelligence × life satisfaction	−.45***	−6.11***				

Note. $^*p < .05$. $^{**}p < .01$. $^{***}p < .001$. $N = 495$. Gender was coded as follows: male 0, female 1. Marital status was coded as follows: single 1, married 2, divorced 3, separated 4, and widowed 5. Religious affiliation was coded as follows: Christianity 1, Islam 2, and other religious affiliation 3. Academic qualification was coded as follows: up to ordinary level certificate 1, Nigeria certificate in education or national diploma 2, higher national diploma or first degree 3, and postgraduate degree 4.

The findings of previous studies (e.g., Amini & Douarin, 2020; Li & An, 2019; Ogungbamila & Ojogo, 2020) on the inverse relationship between life satisfaction and corrupt tendencies have been corroborated by the results of the present study. Public sector employees who felt that their present condition of living approximated their personal standard might have frown at corruption because they did not perceive corruption was not one of the means to being satisfied with life. However, those were not satisfied with life might have felt justified to support and condone corruption maybe because

(a) they could not properly associate their negative feelings toward life with corruption or

(b) they generally perceived corruption as a direct or an indirect way of achieving their subjective goals and aspirations.

Either way, such employees could not see the negative consequences of corruption on the well-being of the organization, other employees, and even themselves. Consequently, employees with low life satisfaction might not feel "morally compelled" to be intolerant of corruption.

Lastly, as proposed in hypothesis 3, life satisfaction significantly increased the level at which moral intelligence reduced corruption tolerance. This implies that employees who were satisfied with life were highly intolerant of corruption because their moral principles reinforced their present condition of living. Those who were not satisfied with life or did not act to reflect high moral principles might have tolerated and condoned corruption because they felt it could provide an easier route to meeting their subjective goals and aspirations.

The results of the present study have shown that life satisfaction further strengthened the level at which an increase in moral intelligence was related to a decrease in corruption tolerance. These findings have implications for theory, research, and management of corruption in organizations.

The implication of the results of the present study for theory is that low satisfaction with life may provide employees with justification for behaving in dissonance with universal moral principles, especially if they perceive that corruption tolerance would provide the needed avenue for meeting their subjective goals. Since moral intelligence is acquired based on individuals' cognitive and affective self-reactions to the society through reward and punishment (Bandura, 1991), if moral transgressions are tolerated, employees may perceive corruption as an acceptable way of meeting personal goals and aspirations. The results of the current study extended Bandura's (1991) theory of moral development by indicating that employees who had low moral intelligence tended to tolerate corruption more than those who had higher level of moral intelligence probably because they believed that corruption might provide the needed avenues to meeting their subjective goals and life satisfaction.

In terms of practice, the present study has shown that organizations, especially public sector organizations, should not tolerate moral transgressions so that employees would not perceive corruption as an acceptable way of meeting personal goals and aspirations. Organizations should also provide legitimate and morally acceptable means through which employees could achieve their personal goals and meet their subjective aspirations.

In addition to that, public sector organizations should train employees, through psycho-education and modelling, to appropriately interpret and react to corruption-promoting situations in a morally intelligent manner. All these would help in creating and promoting such a moral atmosphere would discourage corruption and corruption tolerance.

Another implication of the findings of this study is in the area of research. Though the study has shown that moral intelligence and life satisfaction reduce corruption tolerance, it has not empirically demonstrated how low life satisfaction, especially among those who are morally intelligent, could lead to low or high level of corruption tolerance.

Future studies should, therefore, conduct experiments, which may involve the use of vignettes to investigate how those who have low life satisfaction could either become highly intolerant or tolerant of corruption. This may help explain why poverty may not automatically lead to corruption or corruption tolerance.

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APPENDIX A: CORRUPTION TOLERANCE INVENTORY

Instructions

The following are statements people often use to describe their feelings and actions. Please, read each statement carefully and indicate how often you exhibit the feeling or action expressed in the statement by ticking **(√)** one of the numbers in front of each statement. **The numbers stand for: 0 = not at all, 1 = a little, 2 = moderately, 3 = quite often, 4 = most of the time, 5 = always.**

1. I don't worry over minor acts of corruption.
2. I think others describe me as someone who condones wrongdoing.
3. I keep a dishonest act secret, no matter what.
4. I worry when others take what does not belong to them.
5. I feel uncomfortable when my favorites are punished for engaging in corruption.
6. I overlook it when others help their favorites at the expense of the organization/society.
7. To remain relevant, I overlook acts of corruption.
8. To be secure, I overlook acts of corruption.
9. I don't support any form of financial inducement.
10. I feel upset when others try to cover up corruption.
11. The thought of punishing my favorites for engaging in corruption makes me depressed.
12. I don't support cheating, no matter what.
13. I get angry when others are given undue advantage.
14. I won't punish an act of corruption if it has no direct victim.
15. I overlook acts of corruption that border on economic survival.
16. I don't criticize others for being dishonest.
17. I think others describe me as a "no nonsense person".
18. I don't tolerate bribery.
19. I feel that my behaviors indirectly encourage corruption.
20. I overlook it when others help themselves at the expense of the organization/society.
21. I feel depressed when others punish their favorites for being dishonest.

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