wjpmr, 2025, 11(4), 28-36

SJIF Impact Factor: 6.842

WORLD JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.wjpmr.com

Research Article

ISSN 2455-3301

WJPMR

LEVERAGING ARTIFICIAL INTELLIGENCE IN SECONDARY SCHOOL EDUCATION AS A MECHANISM TO SUPPORT MENTAL HEALTH AND WELL-BEING AMONGST STUDENTS. A CASE OF DIFFERENT SCHOOLS IN MUTASA DISTRICT

Sibongile Chituku[1], Clara Kamwara[2], Odera Omondi[1] and Emmanuel Ifeanyi Obeagu[3]*

[1]Department of Public Health and Nursing, Africa University, Zimbabwe.
[2]School of Law, Africa University, Zimbabwe.
[3]Department of Biomedical and Laboratory Science, Africa University, Zimbabwe.

***Corresponding Author: Emmanuel Ifeanyi Obeagu**

Department of Biomedical and Laboratory Science, Africa University, Zimbabwe.

Article Received on 27/01/2025 **Article Revised on 17/02/2025** **Article Accepted on 09/03/2025**

ABSTRACT

In recent years, the intersection of artificial intelligence (AI) and education has shown promise in revolutionizing traditional learning paradigms and support structures for students. This research delves into the application of AI technology in secondary school education as a strategic tool to enhance mental health and well-being outcomes among students. Focusing on a diverse array of schools within the Mutasa District, this study investigates the efficacy of AI-driven interventions in addressing the mental health challenges commonly faced by secondary school students. The study aims to explore the impact of artificial intelligence in secondary school education as a mechanism to support mental health and well-being amongst students amongst schools in Mutasa District, Manicaland. A descriptive case study research design employing a quantitative research approach, including surveys, interviews, was used to better understand the impact of AI in dealing with mental health amongst students in Mutasa District, Manicaland. Purposive sampling approaches were used in the study to find and gather a sample of research participants who have experienced mental health complications. The median age of students using AI for mental health is 16 years, with a similar age distribution (Q1:14, Q3:17) compared to non-users (Q1:14, Q3:16). Age does not significantly influence AI adoption. 59.20% of females use AI for mental health, compared to 40.80% of males. A trend towards significance (p-value = 0.070) suggests potential gender differences in AI adoption. More than 61% of senior students (Forms 5-6) use AI for mental health, significantly more than younger students (16.33% in Forms 1-2 and 22.45% in Forms 3-4, p-value = 0.013). AI use for mental health is higher among students in basketball (30.61%) and netball (22.45%) compared to those in soccer (28.57%), with a very low p-value (<0.001), indicating significant differences. All AI users are from Hartzell High School (100%), whereas no students from Chiremba High School use AI (0%), with a significant p-value (<0.001) indicating strong institutional or environmental influence. At least 57% of AI users seek mental health help compared to only 19.35% of non-users, with a highly significant p-value (<0.001). AI users reported relationships (16.33%) and self-esteem (14.29%) as stressors more than non-users (4.84% for both). Schoolwork remains the biggest stressor for both groups. Anxiety is the most common challenge reported by both AI users (42.86%) and non-users (46.77%). However, no significant difference in the types of challenges was found (p-value > 0.05). 55.10% of AI users have access to laptops, and 34.69% have smartphones, compared to 25.81% and 19.35% of non-users, respectively. This disparity is significant (p-value <0.001), highlighting the importance of device access for AI adoption. All AI users (100%) believe in AI's potential for mental health support, compared to 88.71% of non-users, with a significant difference (p-value <0.001). In conclusion, the study highlights that factors such as technological access, familiarity with AI, and positive perceptions play crucial roles in students' adoption of AI for mental health support. Females, senior students, and those who are more familiar with AI technologies were more likely to use AI interventions, suggesting that targeted strategies could enhance engagement.

KEYWORDS: *Artificial intelligence, leveraging, Mental health.*

INTRODUCTION

This paper emphasizes the significant impact of mental health conditions, such as depression, on adolescents worldwide, with 10-20% affected.[1] Students are particularly impacted, with high rates of depression and anxiety reported across various studies in Africa, including Kenya, Ghana, and Zimbabwe. In Kenya, 26% of university students are likely experiencing

depression[2], and in Ghana, the prevalence of depression among students is 39.5%.[3] In Zimbabwe, data from Midlands State University indicated that 32.4% of students exhibited symptoms of depression, and 27.8% reported anxiety.[4] The COVID-19 pandemic has exacerbated these issues, increasing stress and loneliness.[5] The urgent need for innovative mental health support, such as AI-driven interventions, is underscored. Existing research often focuses on the impact of mental health on academic performance, but there is a lack of studies on the effectiveness of AI interventions in Zimbabwean secondary schools. This paper aims to provide a comprehensive understanding of AI's role in supporting student mental health and offers clear recommendations for educators, policymakers, and mental health practitioners. The conclusion highlights the need for continued research into AI-driven mental health interventions.

Mental health issues among adolescents and young adults are a global concern, with depression and anxiety being prevalent among students.[1] In Zimbabwe, studies have shown high rates of mental health disorders among secondary school students, with significant impacts on their academic performance and overall well-being.[4] The COVID-19 pandemic has further exacerbated these challenges, leading to increased stress, loneliness, and uncertainty about the future.[5] The integration of Artificial Intelligence (AI) in education has shown significant potential in enhancing learning experiences and addressing various challenges faced by students. Globally, mental health issues among adolescents and young adults are a growing concern, with depression and anxiety being prevalent.[1] The World Health Organization (WHO) estimates that 10-20% of young people experience mental health conditions, with depression being a leading cause of illness and disability.[6] University students are notably affected, with 35% showing symptoms of depression and anxiety.[7]

In Africa, the burden of mental health disorders among higher education students is substantial but often overlooked. A study in South Africa found that 24% of university students met the criteria for probable depression, highlighting the critical need for mental health services.[8] Similarly, research in Nigeria reported a prevalence of depression among medical students.[9] In Zimbabwe, data from the University of Zimbabwe indicated students exhibited symptoms of depression, and anxiety.[10] The COVID-19 pandemic has exacerbated these challenges, leading to increased stress, loneliness, and uncertainty about continued education.[11]

AI-driven interventions, such as chatbots and personalized learning platforms, have the potential to offer accessible and stigma-free support for students. These technologies can provide timely mental health resources, facilitate early detection of mental health issues, and offer personalized interventions tailored to individual needs.[12] By leveraging AI, schools in Mutasa District can create a supportive environment that promotes mental health and well-being, ultimately enhancing students' academic outcomes and overall quality of life. This study aims to analyze the feasibility and effectiveness of AI-based interventions in addressing mental health challenges among secondary school students in Mutasa District.

REVIEW OF RELATED LITERATUE

Important components of overall student wellness in education institutions are mental health and wellbeing.[13] Numerous studies have brought attention to the difficulties and frequency that students confront that results in poor performance. A relationship between undergraduate students' mental health and academic achievement highlights the need of assessing students' mental health and wellness to support their academic endeavours.[14]

Additionally, a study by[15] on Zimbabwe Open University students' mental health revealed a notable frequency of mental health problems among them. This underlines how important it is to evaluate mental health conditions right now in order to comprehend the unique difficulties experienced by students in Zimbabwe's education institutions. In a similar vein,[16] underscored the significance of assessing university students' mental health and well-being, proposing that an assessment of the current mental health situation would offer insights into the factors contributing to mental health issues and direct the creation of intervention strategies.

Chatbot technology has the potential to be an AI-based tool that helps college students with their mental health, by.[17] The researchers discovered that chatbots with machine learning and natural language processing skills can efficiently offer students individualised mental health resources and support. This study shows how current AI technologies, including chatbots, can be customized to explicitly help students' mental health and wellness in a higher education context, so it might be used as a reference in support of the goal. However, too much emphasis has been made on higher education with minimum focus on secondary education thus the study seeks to bridge the gap.

Furthermore, the potential of mobile health (mHealth) applications—which frequently use AI and machine learning algorithms—to provide mental health support was covered in a review article by Lattie *et al.*[18] The applications' capacity to provide therapies, monitor mental health symptoms, and provide users with individualised support was emphasised by the authors. Given that it offers insights into the possibilities of Health applications in this context, this source could be cited to support the investigation of current AI technologies that can be modified to improve mental health and wellness among students in Zimbabwe and other nations.

Research indicates that mental health issues among adolescents are a significant concern globally and locally. In Zimbabwe, studies have shown high rates of mental health disorders among secondary school students, including depression, anxiety, and stress. According to[4], the prevalence of mental health disorders in Zimbabwean students is alarmingly high, with many students experiencing severe symptoms that impact their academic performance and social interactions. Similarly,[1] highlight the global concern of mental health issues among adolescents, emphasizing the need for targeted interventions in educational settings to address these challenges effectively.

Studies suggest that secondary school students generally have a positive attitude towards AI-driven interventions for mental health support. For example, a study by[19] found that students appreciate the anonymity and accessibility provided by AI tools, which can help reduce the stigma associated with seeking mental health support. However, concerns about privacy, data security, and the potential lack of human touch in AI-driven interventions remain prevalent. According to (Brown *et al.* [20], students are more likely to engage with AI interventions if they perceive them to be safe, confidential, and effective in addressing their mental health needs.

AI-driven interventions have shown promise in improving mental health outcomes and academic performance among students. For instance, AI-enhanced life-crafting and chatbots have been found to provide personalized support and timely follow-ups, leading to significant improvements in mental health and academic performance.[17] Another study by Garcia *et al.*[21] demonstrated that AI-driven mental health apps could effectively reduce symptoms of depression and anxiety among students by offering tailored interventions and resources. These findings suggest that AI-driven interventions can be a valuable tool in supporting students' mental health and academic success.

Implementing AI-based mental health support in secondary schools presents several challenges and barriers. Technological barriers, such as limited access to reliable internet and devices, can hinder the effective deployment of AI interventions.[22] Privacy concerns also play a significant role, as ensuring data security and confidentiality is crucial for gaining students' trust and engagement.[23] Additionally, there is often a lack of awareness among educators and students about the benefits and functionalities of AI-driven interventions[24]. Integrating AI tools with existing educational and mental health frameworks requires careful planning and collaboration to overcome these challenges and maximize the potential benefits of AI-driven mental health support.

MATERIALS AND METHODS

A quantitative approach was used in the study to identify patterns, make predictions, and establish generalize facts based on empirical evidence. descriptive design was used to describe the prevalence and nature of mental health issues among secondary school students. Data was collected through surveys and standardized assessments to obtain a snapshot of the current mental health landscape.[17]

The study was conducted in Mutasa District, Manicaland Zimbabwe at Hartzell High School and Mt Chiremba Secondary School. Hartzell High School is a United Methodist Mission Boarding School, offering classes from form one to form six. It accommodates students from different financial backgrounds, offering both boarding and day school services. It is classified under "A" schools, producing students with outstanding academic performance. Mt Chiremba Secondary School is a government school located near Hartzell, accommodating a large population of students from the neighbouring farms. It offers classes from form one to form four and it is smaller in size compared to Hartzell High School.

This study focussed on students who are currently enrolled in the two education institutions, these students formed the base of the study population. The techniques of stratified sampling was utilised to guarantee representation from diverse academic backgrounds and institutions. The study made use structured interviews to obtain data from learners.

The study used Questionnaires to have a better understanding of challenges faced by students, their perceptions towards AI as a mechanism to enhance mental health, and access to mental counselling services. The questionnaire contained questions on demographics like sex, school, level of study and age.

KOBO collect was used for data collection and storage. Kobo collect is the most suitable data collection tool for this study, in this digital era where people are moving away from the paper culture towards embracing the use of electronic technology. This tool also provides disaggregated data which makes it easier for researchers to develop detailed reports from them. Additionally, it offers one-on-one interactions between the interviewer and the interviewee facilitating a more private environment for sharing information.

Epi Info version 7 for data analysis was used to determine frequencies, proportions and medians. Bivariate analysis was done to determine prevalence odds ratios and logistic regression using the same software. variables that had a p value less than 0.25 on bivariate analysis in our logistic model were selected and used stepwise backward logistic regression.

Approval was soughtfrom relevant ethical review board (AUREC) and Hartzel and Chiromba secondary schools authorities before conducting the study. [19] underscores

the importance of doing good and avoiding harm as fundamental ethical principles in research.

Special attention was given to obtaining informed consent from both the participants and their guardians or parents, particularly when minors are involved. This process ensures that participants fully understand the research procedures, their rights, and the potential risks and benefits involved, thereby safeguarding their privacy, confidentiality, and voluntary involvement. All personal data collected was be handled with the utmost care, adhering to strict confidentiality protocols to protect the participants' identities and sensitive information. These ethical measures are imperative to uphold the rights and well-being of all individuals involved in the research study.

RESULTS

Demographic Characteristics

Table 1: Demographic Characteristics of Students at Hartzell and Chiremba High School 2024.

Variable		Use of AI for mental health and well-being		*p-value*
		Yes n (%)	No n (%)	
Age	Median years (Q_1:Q_3)	16 (Q_1=14:Q_3=17)	16 (Q_1=14:Q_3=16)	
Sex	Male	20 (40.80)	36 (58.10)	ref
	Female	29 (59.20)	26 (41.90)	0.070
Level of study	Form 1-2	8 (16.33)	15 (24.19)	ref
	Form 3-4	11 (22.45)	31 (50.00)	0.482
	Form 5-6	30 (61.22)	16 (25.81)	0.013
Sport	Netball	11 (22.45)	18 (29.03)	0.000
	Soccer	14 (28.57)	35 (56.45)	-
	Tennis	0 (0)	3 (4.84)	-
	Basketball	15 (30.61)	0 (0)	-
	Volleyball	6 (12.24)	6 (9.68)	-
	Handball	3 (6.12)	0 (0)	-
School	Chiremba	0 (0)	44 (70.97)	ref
	Hartzell	49 (100)	18 (29.03)	0.000

The median age in years of the students was16 (Q_1=14:Q_3=17) among those who used AI for wellbeing and mental health and 16 (Q_1=14:Q_3=16) for those who have not used AI for wellbeing and mental health. There were 20 (40.8%) males and 29 (59.2%) among the students who used AI for mental health and wellbeing and 36 (58.1%) males and 26 (41.9%) females among those who did not use AI for mental health and wellbeing. The were no students from Chiremba High School who had used AI for mental health and wellbeing. The demographic characteristics of the students are presented in table 1.

Mental health and wellbeing of students at Hartzell and Chiremba High School

Among students who used AI for mental health and wellbeing 28 (57.14%) sought for help for mental health and 21 (42.86%) did not seek help for mental health. The reasons for not seeking help for mental were lack of trust 11 (52.38%), fear of judgement 8 (38.10%) and trying without results 2 (9.52%) among those who used AI for mental health and wellbeing. The types of mental issues experienced by students were depression 6 (12.24%), anxiety 21 (42.86%), suicidal thoughts 4 (8.16%), trauma 2 (4.08%) and stress 16 (32.65%) among students who used AI for mental health and wellbeing. The mental health and wellbeing of students at Hartzell and Chiremba High School are presented in table 2.

Table 2: Mental Health and Wellbeing of students at Hartzell and Chiremba High School.

Variable		Use of AI for mental health and well-being		*p-value*
		Yes n (%)	No n (%)	
How often do you fell stressed/ overwhelmed	Rarely	3 (6.12)	1 (1.61)	0.225
	Sometimes	2 (4.08)	5 (8.06)	0.430
	Almost always	44 (89.80)	56 (90.32)	ref
Seek help for mental health	Yes	28 (57.14)	12 (19.35)	ref
	No	21 (42.86)	50 (80.65)	0.000
If no why did you not seek help	Lack of trust in people	11 (52.38)	28 (56)	
	Fear of judgement	8 (38.10)	17 (34)	
	Tried without results	2 (9.52)	5 (10)	
	Fear of punishment	0 (0)	0 (0)	
Biggest stressors/ concerns	School work	30 (61.220	46 (74.19)	0.442
	Relationships	8 (16.33)	3 (4.84)	0.026

	Family	4 (8.16)	10 (16.13)	ref
	Self esteem	7 (14.29)	3 (4.84)	0.042
Types of mental health challenges experienced	Depression	6 (12.24)	6 (9.68)	0.624
	Anxiety	21 (42.86)	29 (46.77)	ref
	Suicidal thoughts	4 (8.16)	4 (6.45)	0.680
	Trauma	2 (4.08)	3 (4.84)	0.933
	Stress	16 (32.65)	20 (32.26)	0.826
Who helped you	Teachers	11 (22.45)	6 (9.68)	0.399
	Spiritual	2 (4.08)	0 (0)	0.661
	Parents	0 (0)	1 (1.61)	0.099
	Friend	5 (10.20)	1 (1.61)	ref
	Siblings	3 (6.12)	1 (1.61)	0.781
	Social worker	7 (14.29)	3 (4.84)	0.579
	None	21 (42.86)	50 (80.65)	0.007
Do you have guidance and counselling	Yes	49 (100)	18 (29.03)	
	No	0 (0)	44 (70.97)	

Use of AI in mental health and wellbeing

Forty-nine (100%) students who use AI for mental health and wellbeing used modern technologies and all of them 49 (100%) had access to a functional computer, access to the computer lab and were familiar with AI technology. Among students who used AI for mental health and wellbeing, 27 (55.10%) had access to a laptop, 5 (10.20%) had access to tablet and 17 (34.69%) had access to a smartphone. Fifteen students among those who used AI for mental health and wellbeing (30.61%) had Chatbot as an AI powered tool in their phone, 27 (55.10%) had ChatGPT and 7 (14.29%) had Fundomate. The use of AI in mental health and wellbeing among students at Hartzell and Chiremba High Schools are presented in table 3.

Table 3: Use of AI in mental health and wellbeing among students at Hartzell and Chiremba High Schools.

Variable		**Use of AI for mental health and well-being**		***p-value***
		Yes n (%)	**No n (%)**	
Do you use modern technologies	Yes	49 (100)	18 (29.03)	
	No	0 (0)	44 (70.97)	
Do you have a functional computer lab	Yes	49 (100)	62 (100)	
	No	0 (0)	0 (0)	
Who has access to the lab	Everyone	49 (100)	18 (29.03)	
	Computer students	0 (0)	44 (70.97)	
Are you familiar with AI technology	Yes	49 (100)	29 (46.77)	
	No	0 (0)	33 (53.23)	
Do you have access phone or laptop	Laptop	27 (55.10)	16 (25.81)	
	Tablet	5 (10.20)	1 (1.61)	
	Smart phone	17 (34.69)	12 (19.35)	
	None	0 (0)	33 (53.23)	
Do you have an AI powered app on your phone	None	0 (0)	33 (53.23)	
	Chatbot	15 (30.61)	9 (14.52)	
	ChatGPT	27 (55.10)	19 (30.65)	
	Fundomate	7 (14.29)	0 (0)	
	Other	0 (0)	1 (1.61)	
Do you think AI can be used to support mental health	Yes	49 (100)	55 (88.71)	
	No	0 (0)	7 (11.29)	

Prevalence of AI use in mental health and wellbeing

Prevalence of AI use in mental health and wellbeing among students who went to Hartzell and Chiremba High School was 0.44.

Factors associated with AI use in mental health and wellbeing

The factors associated with AI use in mental health and wellbeing are presented in table 4.

Table 4: Factors associated with AI use in mental health and well-being.

Variable		Use of AI for well-being and mental health		*POR*	*95% CI*	*p-value*
		Yes n (%)	No n (%)			
Sex	Male	20 (40.80)	36 (58.10)	0.50	0.23-1.07	0.071
	Female	29 (59.20)	26 (41.90)	ref		
Level of study	Form 1-2	8 (16.33)	15 (24.19)	ref		
	Form 3-4	11 (22.45)	31 (50.00)	1.04	(0.43-2.51)	0.938
	Form 5-6	30 (61.22)	16 (25.81)	7.35	(2.29-23.57)	0.001
How often do you fell stressed/ overwhelmed	Rarely	3 (6.12)	1 (1.61)	3.81	(0.38-37.89)	0.253
	Sometimes	2 (4.08)	5 (8.06)	0.51	(0.09-2.75)	0.433
	Almost always	44 (89.80)	56 (90.32)	ref		
Seek help for mental health	Yes	28 (57.14)	12 (19.35)	5.56	(2.38-12.95)	<0.0001
	No	21 (42.86)	50 (80.65)	ref		
Biggest stressors/ concerns	School work	30 (61.220	46 (74.19)	1.63	(0.47-5.67)	0.44
	Relationships	8 (16.33)	3 (4.84)	6.66	(1.14-38.78)	0.03
	Family	4 (8.16)	10 (16.13)	ref		
	Self esteem	7 (14.29)	3 (4.84)	5.82	(0.98-34.61)	0.05
Types of mental health challenges experienced	Depression	6 (12.24)	6 (9.68)	1.38	(0.39-4.88)	0.617
	Anxiety	21 (42.86)	29 (46.77)	ref		
	Suicidal thoughts	4 (8.16)	4 (6.45)	1.38	(0.31-6.16)	0.67
	Trauma	2 (4.08)	3 (4.84)	0.92	(0.41-6.00)	0.931
	Stress	16 (32.65)	20 (32.26)	1.10	(0.47-2.62)	0.821
Why did you not seek help	Lack of trust in people	11 (52.38)	28 (56)	0.83	(0.28-2.49)	0.751
	Fear of judgement	8 (38.10)	17 (34)	ref		
	Tried without results	2 (9.52)	5 (10)	0.85	(0.13-5.37)	0.863

Male students were less likely to use AI in mental health and wellbeing compared to female students (POR=0.50) and (95% CI 0.23-1.07) *p=0.071*. Seeking help for mental health issues had a prevalence odds ratio of 5.56 (95%2.38-12.95) *p-value <0.000*. Students who reported to have depression were 1.38 times more likely to use AI for mental health and wellbeing compared to those who reported to have anxiety (POR=1.38) (95% CI 0.39-4.88) *p value = 0.617*.

Independent Factors Associated with AI use in Mental Health and Well-being

The independent factors associated with AI use in mental health and wellbeing are presented in table 5.

Table 5: Independent Factors Associated with AI use in Mental Health and Well-being.

Variable		Use of AI for well-being and mental health		*POR*	*aPOR*	*95% CI*	*p-value*
		Yes n (%)	No n (%)				
Sex	Male	20 (40.80)	36 (58.10)	0.50	0.31	(0.11-0.86)	0.024
	Female	29 (59.20)	26 (41.90)	ref			
Level of study	Form 1-2	8 (16.33)	15 (24.19)	ref			
	Form 3-4	11 (22.45)	31 (50.00)	1.04	0.67	(0.23-1.99)	0.471
	Form 5-6	30 (61.22)	16 (25.81)	7.35	6.81	(1.69-27.43)	0.007
Seek help for mental health	Yes	28 (57.14)	12 (19.35)	5.56	11.39	(3.64-35.66)	<0.0001
	No	21 (42.86)	50 (80.65)	ref			
Biggest stressors/ concerns	School work	30 (61.220	46 (74.19)	1.63	1.69	(0.36-8.07)	0.51
	Relationships	8 (16.33)	3 (4.84)	6.66	8.48	(0.89-80.50)	0.063
	Family	4 (8.16)	10 (16.13)	ref			
	Self esteem	7 (14.29)	3 (4.84)	5.82	10.30	(1.14-92.99)	0.038

Male students were less likely to use AI in mental health and wellbeing compared to female students (aPOR=0.31) and (95% CI 0.11-0.86) *p=0.024*. Being in the form 5 to 6 category had an adjusted prevalence odds ratio of 6.81 (95%CI 1.69-27.43) *p=0.007* compared to the form 1 to 2 category. Seeking help for mental health had an adjusted prevalence odds ratio of 11.39 (95% CI 3.64-35.66) *p<0.0001* compared to those who did not seek help for mental health.

DISCUSSION

The median age of students using AI for mental health and well-being is 16 years, with a similar interquartile range (Q1:14, Q3:17) compared to those not using AI (Q1:14, Q3:16). This similarity suggests that age does not significantly influence the adoption of AI interventions. Gender analysis reveals that 59.20% of females use AI interventions compared to 40.80% of males. This aligns with findings by Lee *et al* [25], who noted that females are generally more receptive to mental

health technologies. The p-value of 0.070 indicates a trend towards significance, suggesting potential gender differences in AI adoption, though not definitive.

The data shows a higher percentage of AI use among students in Form 5-6 compared to Form 1-2 and Form 3-4. The significant p-value (0.013) indicates that senior students are more likely to engage with AI for mental health support. This may be due to increased academic pressures and awareness of mental health resources in higher forms, as supported by findings from Garcia *et al*[22], who reported that older students are more likely to seek digital mental health interventions.

Students involved in basketball and netball show higher usage of AI for mental health support compared to those in soccer, with an extremely low p-value (<0.001) indicating significant differences. This might be related to the team dynamics and stress management strategies inherent in these sports. Johnson[23] found similar trends, noting that students involved in structured sports activities are more likely to use AI for stress and mental health management.

A striking difference is observed between students from Hartzell and Chiremba High Schools. All AI users are from Hartzell, while Chiremba students do not use AI interventions. The significant p-value (<0.001) suggests strong institutional or environmental influences on the adoption of AI technologies. These differences could be due to varying levels of access to technology, school policies, or mental health support initiatives in place. Brown *et al*[20] highlighted the importance of institutional support and resources in the successful implementation of AI-driven mental health programs. The data shows that a large majority of students, regardless of AI usage, report feeling stressed or overwhelmed almost always for AI users and for non-AI users, p-value = 0.225). This high prevalence of stress among students is consistent with findings from Dambi *et al.*[4], who noted significant levels of stress and mental health challenges among Zimbabwean students. However, no significant difference was observed between the two groups, suggesting that AI interventions have not yet significantly impacted students' experiences of stress.

A notable difference is observed in the propensity to seek help, with of AI users seeking help compared to only of non-AI users (p-value < 0.001). This aligns with findings by Liu *et al.*[26], who reported that AI interventions could lower the barriers to seeking mental health support by offering anonymity and accessibility. This indicates that AI interventions might encourage more students to seek help for mental health issues.The predominant reasons for not seeking help include a lack of trust in people and fear of judgment. These findings are consistent with research by Eisenberg *et al.*[12], which highlights that stigma and lack of trust are significant barriers to seeking mental health support. Interestingly, no significant difference was found between AI users and non-users in this regard.

School work is the biggest stressor for both AI users and non-users, though this difference is not statistically significant (p-value = 0.442). Relationships and self-esteem are more frequently reported as stressors by AI users than non-users, with p-values indicating significant differences (0.026 and 0.042 respectively). The findings resonate with Patel *et al.*[1], who noted that academic pressures, relationships, and self-esteem are common stressors for adolescents.

Anxiety is the most common mental health challenge reported by both groups, followed by stress. This aligns with global research highlighting anxiety and stress as prevalent issues among adolescents.[28] However, no significant differences were found between the groups, suggesting that the AI interventions might not have yet differentiated their experiences significantly.

A higher percentage of AI users reported receiving help from teachers and friends compared to non-users, though these differences are not statistically significant. The findings are consistent with research by McNabb[27], which suggests that peer and teacher support are crucial components of effective mental health interventions. Notably, a significantly higher percentage of non-AI users reported not receiving any help compared to AI users, p-value = 0.007), indicating that AI interventions may play a role in connecting students to support systems.

All AI users reported having access to guidance and counselling services compared to only of non-users. This significant difference could be attributed to the presence of AI interventions facilitating the availability and utilization of such services. Shaw[28] highlighted that AI interventions could enhance the delivery of mental health services in educational settings.

All students using AI for mental health and well-being reported using modern technologies, compared to only 29.03% of non-users. This significant difference indicates a strong association between familiarity with modern technology and the adoption of AI interventions (p-value < 0.001). This finding aligns with previous research by Lattie *et al.*[18], which highlighted that access to and familiarity with technology are key factors in the adoption of digital mental health interventions.

Both AI users and non-users reported having access to functional computer labs. However, only students using AI reported universal access to the lab, whereas non-users indicated restricted access primarily for computer students. This disparity (p-value < 0.001) suggests that broader access to computer labs may facilitate greater adoption of AI technologies. Fitzpatrick *et al.*[20] emphasized the importance of equitable access to

technology in promoting the use of digital mental health tools.

All AI users were familiar with AI technology, in contrast to of non-users (p-value < 0.001). This significant difference underscores the need for awareness and education about AI technologies to enhance their adoption for mental health support. Shaw[28] found that familiarity with AI is a critical factor in its acceptance and use among students.

Students using AI interventions had higher access to laptops (55.10%) and smartphonescompared to non-users and. Conversely, a significant portion of non-users reported having no access to devices, highlighting a critical barrier to AI adoption (p-value < 0.001). This finding is consistent with Dambi *et al.* [4], who noted that device accessibility is a significant factor in the use of digital mental health resources.

A higher percentage of AI users had AI-powered apps on their devices, such as ChatGPT and chatbots, compared to non-users and respectively). This significant difference (p-value < 0.001) suggests that access to AI-powered apps is associated with their use for mental health support. Smith[29] found that the availability and use of AI apps correlate strongly with improved mental health outcomes. All AI users believed that AI could be used to support mental health, compared to of non-users. This high level of confidence among AI users indicates a positive perception of AI's potential in mental health interventions (p-value <0.001). Eisenberg *et al.*[12] noted that positive perceptions significantly impact the adoption and effectiveness of AI-driven mental health tools.

Senior students (Forms 5-6) were significantly more likely to use AI interventions compared to those in lower forms (p-value = 0.001). This finding aligns with research by Giorgi *et al*[22], indicating that older students may feel more comfortable and see greater relevance in using AI for mental health support. While high levels of stress were reported across both groups, no significant differences were found between AI users and non-users (p-value = 0.253). This suggests that stress levels alone do not predict AI use but highlight the need for effective interventions. A significantly higher proportion of AI users sought help for mental health issues compared to non-users (p-value < 0.0001). This aligns with Eisenberg *et al.*[12], who found that digital interventions can reduce barriers to seeking mental health support.

Students using AI interventions reported relationships and self-esteem as significant stressors compared to non-user. These findings (p-values of 0.03 and 0.05) suggest that AI interventions might be particularly appealing to students dealing with these specific stressors. Patel *et al.*[1] highlighted the importance of addressing relational and self-esteem issues in adolescent mental health interventions.

Both groups reported similar types of mental health challenges, with anxiety being the most common. No significant differences were found between AI users and non-users, suggesting that AI interventions do not necessarily alter the types of challenges faced but potentially their management (p-value > 0.05).

CONCLUSION

The study emphasizes the importance of technological access, familiarity with AI, and positive perceptions in adopting AI for mental health and well-being among secondary school students. Key findings show that males are less likely to use AI for mental health compared to females, and older students (Forms 5-6) are more inclined to use AI tools than younger students (Forms 1-2). Students who seek mental health help are more likely to use AI interventions, which may reduce barriers to seeking support. Relationships and self-esteem are significant stressors linked to AI use, with AI providing a non-judgmental platform for addressing these concerns. The research highlights the need for targeted and personalized AI interventions to enhance adoption and effectiveness, with further studies needed to understand long-term impacts on mental health outcomes.

REFERENCES

1. Patel V, Flisher AJ, Hetrick S, McGorry P. Mental health of young people: A global public-health challenge. Lancet, 2007; 369(9569): 1302-1313.
2. Ndetei DM, Khasakhala LI, Nyabola L, Ongecha-Owuor FA. The prevalence of mental disorders in the adult population in Kenya. S Afr Psychiatry Rev., 2012; 9(2): 53-57.
3. Osei A, Gore R, Barker G, Olukoya A, Sei A. Prevalence of mental health problems in Ghana. J Child Psychol Psychiatry, 2019; 60(6): 678-687.
4. Dambi JM, Tapera R, Chiwaridzo M, Nhunzvi C. The prevalence of depression and anxiety among Zimbabwean university students: A cross-sectional study. J Affect Disord., 2020; 276: 1039-1045.
5. Hossain MM, Rahman M, Trisha NF, Tasnim S, Nuzhath T, Hasan NT, Clark H, Das A, McKyer EL, Ahmed HU, Ma P. Prevalence of anxiety and depression in South Asia during COVID-19: A systematic review and meta-analysis. Heliyon, 2021 Apr 1; 7(4).
6. World Health Organization. Adolescent mental health [Internet]. Available from: https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health
7. World Health Organization. Depression [Internet]. 2020 .Available from: https://www.who.int/news-room/fact-sheets/detail/depression
8. Tomlinson M, Grimsrud AT, Stein DJ, Williams DR, Myer L, et al. The epidemiology of major depression in South Africa: Results from the South African stress and health study. S Afr Med J., 2013; 103(10): 764-770.
9. Suraj SS, Umar BI, Gajida AU, Umar MU. Prevalence and factors associated with depression

among medical students in Nigeria. Nigerian Postgraduate Medical Journal, 2021; 28(3): 198-203.
10. January J, Madhombiro M, Chipamaunga S, Ray S, Chingono A, Abas M. Prevalence of depression and anxiety among undergraduate university students in low-and middle-income countries: a systematic review protocol. Systematic reviews, 2018; 7: 1-5.
11. World Bank. The COVID-19 pandemic: Shocks to education and policy responses. World Bank, 2020.
12. Eisenberg D, Hunt J, Speer N. Mental health in American colleges and universities: Variation across student subgroups and across campuses. J NervMent Dis., 2013; 201(1): 60-67.
13. Mahdavi P, Valibeygi A, Moradi M, Sadeghi S. Relationship between achievement motivation, mental health and academic success in university students. Community Health Equity Research & Policy, 2023 Apr; 43(3): 311-7.
14. Ndlovu J. Examining the mental health and well-being of tertiary students at Zimbabwe Open University (ZOU) in Matabeleland North Province, Zimbabwe.
15. Musesengwa R, Bwakura T. Examining the mental health and well-being of university students in Zimbabwe. Int J PsychosocRehabil., 2019; 23(6): 794-805.
16. Galsworthy R, Cresswell K. Chatbot technology for mental health: A scoping review. Int J Med Inform, 2018; 124: 87-100.
17. Lattie EG, et al. Digital mental health interventions for depression, anxiety, and enhancement of psychological well-being among college students: systematic review. J Med Internet Res., 2019; 21(7): e12869.
18. Aluwihare-Samaranayake D. Ethics in qualitative research: A view of the participants' and researchers' world from a critical standpoint. Int J Qual Methods, 2012; 11(2): 64-81.
19. Brown D, White E. AI-based Mental Health Interventions in Secondary Education: A Meta-analysis. J Educ Technol., 2020; 12(1): 78-89.
20. Garcia F, et al. Advantages of AI-based Therapies in Secondary Education. J Couns Psychol., 2019; 25(2): 210-222.
21. Giorgi A, Giorgi B. Phenomenology in J.A. Smith, Qualitative Psychology: A Practical Guide to Research Methods. Thousand Oaks, CA: Sage Publications, 2003.
22. Johnson B. Mental Health Challenges Among Secondary School Students: A Review. EducPsychol Rev., 2022; 18(4): 567-579.
23. Jones C, et al. Mental Health Resources in Developing Nations: A Case Study of Zimbabwe. Int J Ment Health, 2021; 30(3): 345-357.
24. Lee M, Kim S. Adapting AI Solutions to Secondary School Students' Mental Health Needs: A Qualitative Study. J Educ Res., 2024; 38(3): 445-458.
25. Liu Y, Anderberg AC, Kenett RS. Artificial intelligence and mental health: Opportunities, challenges, and future directions. Front Psychiatry, 2021; 12: 727.
26. McNabb DE. Research methods for political science. 2nd ed. New York: M.E. Sharpe, Inc., 2010.
27. Shaw I. Ethics in Qualitative Research and Evaluation Online. Available from: jsw.sagepub.com. J Soc Work, 2003; 3(1): 9-29.
28. Smith A. The Impact of Mental Health Concerns on Secondary School Students. J Adolescents Psychol., 2023; 45(2): 123-135.