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**Abstract**

This study attempts to investigate how information literacy skills and attitudes towards electronic resources use predict the use of electronic resources by health sciences postgraduates in Nigeria. A survey research design using the quantitative approach was employed in the study. Further, a two-stage sampling technique [purposive and non-proportional quota] was used to select a sample of 304 health sciences postgraduates. A structured questionnaire was used to collect data. Descriptive (frequency count and percentage) and inferential statistics (Pearson Product Moment Correlation and standard/hierarchical multiple regression) were used to analyse the study data. The hierarchical multiple regression model was used to ascertain the significance of the predictors of the use of electronic resources. The major finding was that the best fitting model for predicting the use of electronic resources would be the linear combination of the constant, information literacy skills and attitudes towards electronic resources use. The study suggests enhanced and sustained positive attitudes and continuous information literacy skills development programmes in higher institutions to further encourage the use of electronic resources by health sciences postgraduates.

**Keywords:** Attitudes towards e-resources use, Health sciences postgraduates, Information literacy skills, Use of e-resources, Nigeria

## Introduction and Background Literature

Electronic resources [also known as e-resources or electronic information resources (EIR)] are digital information and materials accessed and used via numerous devices, including computers, e-readers, smartphones, and tablets (Acheampong et al., 2020; Chimah & Udo, 2015). They include e-books, e-journals, multimedia materials, online databases, and other forms of digital content that have become accepted because of their accessibility, cost-effectiveness, eco-friendliness, and efficiency features (Ajayi et al., 2023; Akuffo & Budu, 2019; Kelefa et al., 2017, Shoaib et al., 2022). Another level of acceptance of e-resources is an institutional commitment to ensure the provision and dissemination of information to students that e-resources conveniently provide (Hong & Jo, 2017; Makinde et al., 2022). E-resources have become indispensable research tools that complement the print collection of long-established academic libraries (Adeniran & Onuoha, 2018; Hashim et al., 2022). In support of the aforementioned, Mohammed (2015) maintained that it is challenging for present-day libraries to completely satisfy customers' needs by employing exclusively conventional information resources considering the currency, depth and quality of diverse customers' information needs. In recent decades, digitalised information resources have been engaged to render library services to different clientele in developed and developing nations (Shoaib et al., 2022). This has made the influence of e-resources to be felt in education, research, and healthcare. Health sciences encapsulate various academic disciplines, plus STEM fields which centre on health, or healthcare, as primary parts of their focus of attention

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(Haruna & Hu, 2018). There are great benefits in employing e-resources by health sciences postgraduates as health sciences postgraduate education progressively heightens with a yearning to enhance human and animal health through scientific research.

Disparate studies have observed postgraduate students' inability to use e-resources including health sciences postgraduates (Adeniran & Onuoha, 2018; Adeleke & Emeahara, 2016; Barfi & Afful-Arthur, 2018; Mathew et al., 2021). In understanding health sciences postgraduates' use of e-resources, this study considered the constructs of information literacy skills and attitudes towards e-resources use. The ineffective use of many e-resources could be due to individual factors connected to users [such as information literacy skills and attitudes] (Ahmed, 2013). Information literacy requires that a person recognises when information is needed, and can find, scrutinise, utilise and then use information ethically to address identified problems or make decisions (Makinde et al., 2023). A reference point in the aforesaid definition is 'ability' which refers to possessed related skills to get information. Information literacy competence also demonstrates the ability of any user to identify information needs, search for relevant resources to meet those needs and analyse, evaluate, synthesise and communicate the resultant knowledge (Tella, 2015). The Association of College and Research Libraries [ACRL] (2016) also describes information literacy skills as the set of integrated abilities encompassing the reflective discovery of information and the use of information in creating new knowledge and participating ethically in communities of learning. Information literacy skills enable learners to access and evaluate information in response to identified needs, define key terms and topics, locate information and present information in the appropriate context (Yevelson-Shorsher & Bronstein, 2018). The possession of skills related to information literacy is essential for the facilitation and generation of new knowledge, further research, and the development of universities and society (Makinde et al. 2023). Concerning attitude, Vargas-Sanchez et al. (2016) describe it as how a person views and evaluates something to respond positively or negatively towards a particular idea, object, person, or situation. Attitude is also an evidence-based practice of positive or negative evaluation of behaviour (Fishman et al., 2021). It is a psychological state of the mind that affects the way a person thinks about situations eventually determining behaviour (Leonard, 2019).

In the use of e-resources by postgraduate students of the Faculties of Arts, Education, Sciences and Social Sciences, computer literacy was observed to have a very strong, positive and significant relationship with usage (Abubakar & Adetimirin, 2015). Similarly, the ICT literacy and ICT skills [being critical aspects of information literacy skills] of postgraduates significantly influenced the use of e-resources with a positive correlation between ICT literacy and ICT skills and the use of e-resources (Suleiman & Enna, 2022). Comparably, information literacy and IT skills of general postgraduates were statistically significant determinants of library use – assisting students in the positive use of library materials – this could affect e-resources use (Mathew et al., 2021). There also exists a significant relationship among general postgraduates concerning information evaluation capability, knowledge of e-resources, search skills and their e-resources use (Ugwulebo & Okuonghae, 2021). However, regarding science postgraduates, a low, significant and positive correlation between information literacy skills and e-resources use was highlighted (Adeniran & Onuoha, 2018). On the contrary, postgraduates excluding those in management sciences demonstrated that computer literacy skills did not affect e-resources use (Ajegbomogun et al., 2022). The above-mentioned studies concern postgraduates of diverse fields apart from the health sciences. These studies demonstrate that the construct [information literacy skills] and similar constructs such as computer literacy skills, ICT literacy and ICT skills have differing effects on e-resources use by postgraduates of diverse fields and institutions. It is hardly surprising that in an earlier postgraduate study by Ndubuisi and Udo in 2013, they stressed the adoption and enhancement of information literacy training programmes to improve searching skills and general use of e-resources.

Since some health sciences postgraduates may belong to other professions such as lecturers, researchers and technologists, among others, certain studies become relevant to understanding the findings of this paper. Information literacy skills were found to have a strong, positive and significant influence on e-resources use by lecturers in diverse disciplines (Ajayi et al., 2023; Ndagi & Madu, 2018). Regarding science faculty, ICT literacy skills significantly influenced e-resources use (Akwaowo et al., 2021;

Ogunsanya & Buraimo, 2020). Librarians also reported that there was a significant relationship between basic computer competencies, information retrieval competencies, Web 2.0 competencies and the use of emerging technologies (Omehia et al., 2021). These emerging technologies could be in the form of e-resources. Relatedly, scientists and technologists at a research institute [with master's and doctoral qualifications] indicated a lack of information literacy skills as an impediment to accessing e-resources (Acheampong et al., 2020). Diverse research papers, both Nigerian and transnational studies involving health sciences postgraduates have uncovered that the level of the use of e-resources is connected to search technique skills, experience, information literacy competencies, student background (science or non-science), and educational qualification (Adeleke & Emeahara, 2016; Kaur, 2018; Ruzegea & Msonde, 2021; Wang & Bai, 2016). In addition, regarding health sciences postgraduates, a low, positive, and significant relationship between information literacy skills and the use of e-resources has also been identified (Adeleke & Emeahara, 2016). As well, a high and encouraging attitude has been observed in health sciences postgraduates concerning the use of e-resources (Jbeen et al., 2022; Okunoye, 2018). The above-reviewed related literature reveals a gap pointing to insufficient studies on health sciences postgraduates relating to the study constructs and indicators.

Many African studies including that of Nigeria showed that postgraduates do not use e-resources as often anticipated by university management, despite the huge financing of making them available (Adeleke, 2021; Ankrah & Atuase, 2018; Fingillah, 2023; Joshua & King, 2020; Mollel & Mwantimwa, 2019; Olajide & Omolehin, 2021; Oseghale, 2023; Shaibu & Mohammed, 2017). Consequently, it is unsurprising that knowledge discovery is currently an issue confronting many postgraduates including health sciences postgraduates (Batallas-González & Garzozi, 2021; Kalanat, 2022; Sharma, 2022). Imsong and Kharbudon (2016) observed that in using e-resources, students lacked skills in evaluating and locating information, which impeded effective use. Akuffo and Budu (2019) noted that some of the constraints to e-resources use were search and retrieval problems. Ankrah and Atuase (2018) also reported that about two-thirds of their studied postgraduates mentioned that insufficient search skills hindered them from accessing e-resources. Deficient information literacy skills were also found as elements responsible for low e-resources use by Mtega et al. (2014). The studies of Akuffo and Budu (2019), Ankrah and Atuase (2018), Mtega et al. (2014) and Imsong and Kharbudon (2016) have pointed to information literacy skills through their indicators as influencing e-resources use. Additionally, Tandi Lwoga and Sukums (2018) uncovered that information literacy competence as a factor predicted self-reported use of e-resources among health sciences faculty, some of these faculty could be postgraduates. Could the results of these existing studies be proven to be valid regarding health sciences postgraduates for the current study response and explanatory variables?

## Statement of the Problem

Many of the earlier mentioned studies focused on general postgraduates and health sciences faculty and not specifically health sciences postgraduates. Some studies have also covered health sciences undergraduate students—such as Bashorun et al. (2021)—dwelling on the factor of information literacy competence, and Osinulu (2020)—focusing on the factor of awareness—as they affect the use of e-resources. However, health sciences postgraduates may exhibit a different perspective regarding the prediction of information literacy skills and attitudes towards e-resources use concerning the use of e-resources in Nigeria. Moreover, demographic characteristics and the indicators of information literacy skills and attitudes have also been scantily studied on how they predict the use of e-resources by health sciences postgraduates in Nigeria.

In light of the above, the insufficient research conducted in this aspect has left a research gap judging from the above-mentioned extant literature on the use of e-resources among health sciences postgraduates, particularly in Nigeria, regarding the response and explanatory variables. Health sciences postgraduates remain the driving force and future of the Nigerian health care system and sector, and, therefore, deserve extra attention concerning information provision factors. This will inform and review academic library policies and practices aimed at improving health sciences postgraduates' academic and research quality. It will also justify the financing of e-resources by university management.

## Research Questions

To achieve the purpose of the study, the following research questions were raised:

1. How well do the two measures of information literacy skills and attitudes towards e-resources use predict the use of e-resources by health sciences postgraduates in public universities in southwest Nigeria? How much variance in the use of e-resources scores can be explained by scores on these two scales?
2. Which is the best predictor of the use of e-resources – information literacy skills or attitudes towards e-resources use?
3. Which of the indicators of attitudes towards e-resources use has an individual significant influence on the use of e-resources by health sciences postgraduates in public universities in southwest Nigeria?
4. Which of the indicators of information literacy skills has an individual significant influence on the use of e-resources by health sciences postgraduates in public universities in southwest Nigeria?
5. If we control for the possible effect of gender and programme of study, is our set of variables (information literacy skills, attitudes towards e-resources use) still able to predict a significant amount of the variance in the use of e-resources?

## Conceptual Model

The conceptual model (Figure 1) is designed by the researchers based on the understanding of the study models and theory [as seen in the method section] and the literature reviewed assisting to comprehend the gap the study seeks to fill. The model describes the relationship between the variables – information literacy skills, attitude towards the use of electronic resources, and the use of electronic resources by health sciences postgraduates. First, it is assumed in this study that the health sciences postgraduates who could identify, search, locate, retrieve, and evaluate information would use electronic resources satisfactorily. Second, the study presumes that health sciences postgraduates who have the appropriate affective, behavioural and cognitive attitudes would use electronic resources better. The study also assumes that health sciences postgraduates who jointly possess and apply sufficient information literacy skills and exhibit the right attitudes towards the use of electronic resources to accomplish tasks will make use of electronic resources. In other words, the use of electronic resources is dependent on information literacy skills and attitude towards the use of electronic resources.

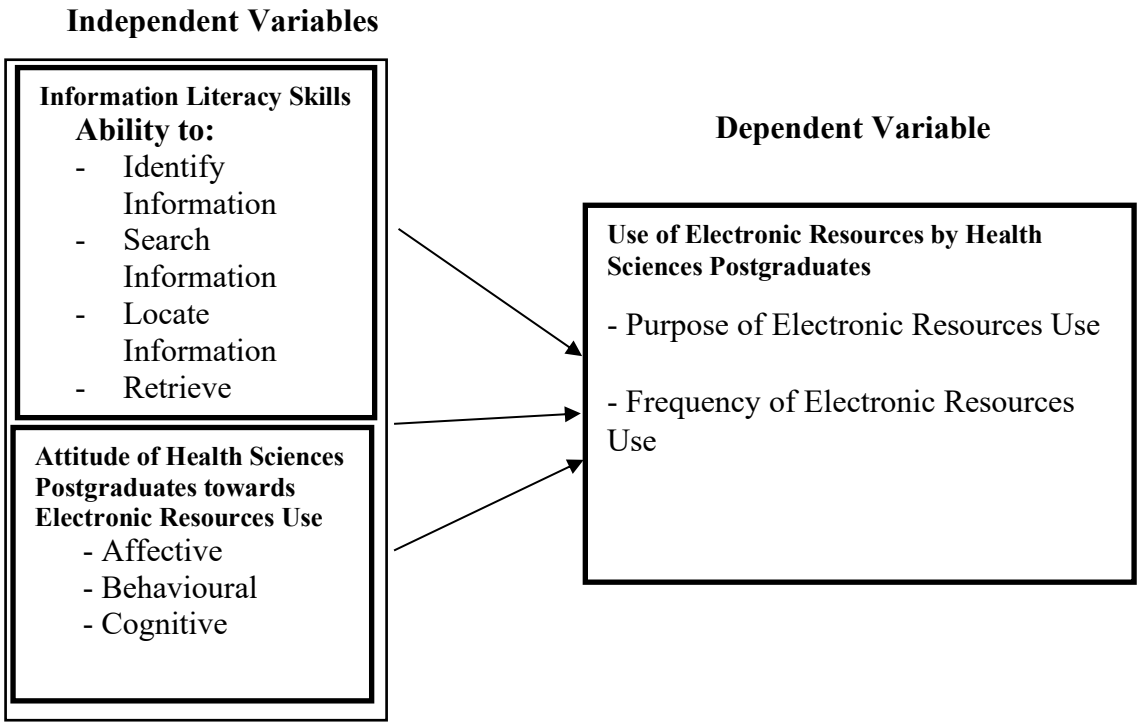


**Figure 1.** Conceptual Model for Attitudes Towards Electronic Resources Use, Information Literacy Skills, and Use Of Electronic Resources by Health Sciences Postgraduates

## Method

### Theoretical Perspective

In understanding the use of e-resources by health sciences postgraduates, this study adapted the Use and Gratification Theory (UGT). The theory was conceived in the early 1940's by Blumler and Katz (Blumler & Katz, 1974). The UGT deals with understanding why people use certain types of media, what needs they have to use them, and what gratifications they get from using them. Despite criticisms, modern thought suggests that the UGT is on the path of revitalisation due to the current communication technology (Sellers, 2020; Xu et al., 2023). The UGT is relevant to this study because it emphasises the usage of media such as e-resources connected to how useful they are and the satisfaction (gratification) that users get from them. The vital assumptions of the UGT also point forward to its adoption in this study, that is, its concern with user goal [e-resources use is goal-oriented]. Further, e-resources are selected because they will satisfy the specific requirements of users and they are always in competition with other types of searching and retrieval media. The UGT helped in the formulation of questions on the purposes of use of electronic resources (Alhabash & Ma, 2017; Blumler & Katz, 1974; Ho & See-To, 2018; Phua et al., 2017). These purposes can be found in the larger study questionnaire as indicated in the footnotes.

Eisenberg and Berkowitz in 1990 came up with the Big Six information skills model (Big6) expanding information literacy knowledge and skills. This study adapted the elements of the Big6 [as indicators of information literacy] including task definition, information-seeking strategy, location and access, use of information, synthesis, and evaluation to determine the information literacy skills of health sciences postgraduates. This model as applied in this study provided important contexts for studying information literacy skills as exhibited in human behaviour. In addition, the model elucidated the nature of the problem to be solved regarding information literacy. The model assists people in solving problems or making decisions using available information described in a six-stage model that incorporates skills in a systematic approach to information problem-solving (Chou et al., 2023; Eisenberg & Berkowitz, 1990; Karim, 2020). The Big6 in addition to the works of ACRL (2016), Eisenberg (2008), and Eisenberg et al. (2004) contributed in the preparation of questions that helped in assessing the information literacy skills of health sciences postgraduates.

In comprehending attitudes towards electronic resources use by health sciences postgraduates (one of the independent variables), the study embraced Ostrom's (1969) model of attitudes (ABC model). This model, from the social psychology domain, adopted the three-component framework of attitudes denoted as A (affect), B (behaviour), and C (cognition). Studies such as Balogun (2016), Hitt et al. (2017), Luthans et al. (2021) and Scandura (2017) have also adopted this model incorporating three components – affective, behavioural, and cognitive. These aforementioned studies as well as the works of Ajzen and Fishbein (2005), Breckler (1984), and DeVellis (2012) assisted in the formulation of questions on the attitudes of health sciences postgraduates. The affective component of attitudes measures how people feel using e-resources (Vargas et al., 2016; Rocklage & Fazio, 2018). It is the attitude that has to do with emotions, feelings and moods, particularly to a person in question and others. The second is the behavioural component. It expresses intentions or actions towards a particular object based on cognitive and affective reactions. The last component of attitudes is the cognitive aspect, which is a part of attitude related to a person's general knowledge. It is connected to beliefs, ideas and thoughts. The cognitive aspect of attitudes weighs an e-resource's applicable qualities or usefulness. In the social sciences and humanities, scholars consider affect and cognition as important factors in human information behaviour (O'Brien et al., 2017). The adoption of the ABC model of attitudes allowed the researchers to investigate how respondents felt, thought and interacted with the attitude object, which in this case is e-resources use.

### Respondents

This study employed a survey research design with a quantitative approach. The unit of analysis was based on the health sciences postgraduates who utilised e-resources for their various undertakings. The questionnaire was administered in six public universities [three federal universities and three state universities] in the southwest region of Nigeria. The two-stage sample of 355 was covered for this study [employing purposive and non-proportional quota sampling techniques] out of a population of 1,233

health sciences postgraduates. The purposive sampling technique helped select public universities with health sciences faculties and those with five common departments (anatomy, nursing, medical rehabilitation, physiology and public health). Secondly, the non-proportional quota sampling using 40% was used to select respondents from the departments. Eventually, 304 respondents [from both master and doctoral programmes] (n=304; 174 females and 130 males) completed analysable copies of the questionnaire. Each respondent returned a signed informed consent. We expected that our sample would be representative since six public universities were appropriately selected in different states and cities in the region. Public universities in Nigeria share similar characteristics in terms of funding and resource allocation/availability (Ogunode et al., 2022; Ogunode et al., 2023).

**Data Collection**

The data collection tool employed in the study was a structured questionnaire. It was utilised because data collected through a structured questionnaire are not difficult to compile for instant statistical analysis and are comparatively unlikely to go through respondent bias (Cheung, 2014).

**Instrument Development**

The self-reported structured questionnaire consisted of five sections: (1) demographic characteristics; (2) purpose of e-resources use by health sciences postgraduates (adapted from Blumler & Katz, 1974); (3) frequency of e-resources use by health sciences postgraduates (adapted from Blumler & Katz, 1974); (4) information literacy skills (adapted from ACRL, 2016; Eisenberg, 2008; Eisenberg & Berkowitz, 1990; Eisenberg et al., 2004); and (5) attitudes towards e-resources use by health science postgraduates (adapted from Ajzen & Fishbein, 2005; Breckler, 1984; DeVellis, 2012; Ostrom, 1969).

The first section collected demographic information about the respondents including faculty, department, programme of study and gender. Faculty and department were open-ended questions and programme of study (master or PhD) and gender (male or female) were binary scale questions. The second section elicited questions on the use of e-resources by health sciences postgraduates – this was based on the frequency and purpose of use. The frequency of use was based on a 5-point Likert scale (Daily, Weekly, Monthly, Less Often and Never) while the purpose of use was based on a 4-point Likert scale (Strongly Agree, Agree, Disagree and Strongly Disagree). The third section measured information literacy skills. The items in this section were personally developed from the existing works of ACRL (2016), Eisenberg (2008), Eisenberg and Berkowitz (1990), and Eisenberg et al. (2004). To measure the construct of information literacy skills appropriately it was split into six indicators namely information identification skills, information searching skills, location of information skills, retrieval skills, evaluation of information skills, and use of information skills. All these indicators had their subscales and they were measured by a 4-point Likert-type scale of Very True of Me, True of Me, Not True of Me and Very Untrue of Me. The fourth section of the structured questionnaire contained questions on attitudes towards e-resources use. The items in this section were also personally developed from the extant works of Ajzen and Fishbein (2005), Breckler (1984), DeVellis (2012), and Ostrom (1969). This was also measured in line with three indicators of affective, behavioural and cognitive with all of them having their subscales. A 4-point Likert-type scale of Strongly Agree, Agree, Disagree and Strongly Disagree was also used.

**Validity and Reliability**

The quality of the questionnaire draft was assessed in two ways. Firstly, copies were given to senior academics for their expert opinions and input. Their corrections as inputs were made. Secondly, Cronbach's alpha statistical test was employed to test the instrument reliability. This involved a pilot study before the main data collection. The questionnaire was administered to 30 health sciences postgraduates of the University of Ilorin – a public university in north-central Nigeria's geopolitical zone. This population was not part of the selected respondents. The result of the statistical reliability test is presented in Table 1. The pre-testing results indicated the significance of alpha value ranging from .75 to .85. Overall, it was .80 for the use of e-resources, 0.97 for information literacy skills and 0.79 for attitudes towards e-resources use.

The pilot study as a trial run of our study did not only help with confirming the reliability, but it also aided in substantiating the construct validity. To achieve construct validity, the researchers ensured that indicators and measurements were meticulously developed based on relevant current knowledge of the study constructs. The questionnaire (can be checked in the URL of the footnotes) included only pertinent questions that measured the known indicators of attitudes towards the use of electronic resources, information literacy skills, and the use of electronic resources.

**Table 1.** Criteria for positioning strategies

| Variable | No of Items | Cronbach's Alpha Value |
|---|---|---|
| **Use of e-resources** | **38** | **0.80** |
| Purpose of e-resources use | 7 | 0.81 |
| Frequency of e-resources use | 31 | 0.79 |
| **Information literacy skills** | **30** | **0.97** |
| Identify Information | 5 | 0.79 |
| Search Information | 5 | 0.85 |
| Locate Information | 5 | 0.83 |
| Retrieve Information | 5 | 0.75 |
| Evaluate Information | 5 | 0.78 |
| Use Information | 5 | 0.85 |
| **Attitudes** | **15** | **0.79** |
| Affective | 5 | 0.75 |
| Behavioural | 5 | 0.82 |
| Cognitive | 5 | 0.80 |

## Data Analysis

The data collected for the research were coded and analysed using descriptive statistics and inferential statistics employing the Statistical Package for the Social Sciences (version 24). The data were analysed at the 0.05 level of significance since it is a behavioural science study. Demographic analysis was done using frequency count and percentage [descriptive analysis]. Further, the analysis of the variables for the research questions was done using Pearson Product Moment Correlation (PPMC) and standard and hierarchical multiple regression [inferential statistics] because of the linear relationships of the variables.

## Ethical Approval

Before data collection, ethical approval was taken from the research and ethics committee of the researchers' university. Approvals were also taken from all constituted authorities of the studied universities to conduct the research. The study was carried out between December 2022 and June 2023.

# Findings

## Demographic Characteristics Results

The demographic characteristics of the study sample showed that the majority of the respondents (134, 44.1%) were from the Department of Public Health while the least respondents were from the Medical Rehabilitation Department (23, 7.6%). Approximately 57% of the respondents – constituting the majority - were females. The highest number of respondents (209, 68.8%) pursued a master's degree qualification.

## Information Literacy Skills and Attitudes towards E-resources Use Predicting the Use of E-resources

Employing the standard multiple regression analysis, the statistically significant relationships among the independent variables (information literacy skills and attitudes towards e-resources) and the dependent variable (use of e-resources) are presented in Table 2. The data in Table 2 showed that there was a positive and strong statistically significant relationship between information literacy skills and the use of e-resources by health sciences postgraduates in public universities in southwest Nigeria (r = .769,

n = 304, p < .05). However, there was no correlation in the lower part of Table 2 because a correlation matrix is symmetrical and half of the correlation coefficients shown in the matrix are redundant and may be unnecessary.

Table 2 also reveals that the correlation coefficient between the variables of attitudes towards e-resources use and the use of e-resources was significant and there existed a positive but moderate relationship between the variables (r = .418, n = 304, p < .05). This implied a positive but moderate statistically significant relationship between attitudes towards e-resources use and the use of e-resources by health science postgraduates in public universities in southwest Nigeria. The scales of both information literacy skills and attitudes towards e-resources use correlate substantially with the use of e-resources (r = .769 and .418 respectively). The correlation between each of the independent variables was not too high allowing for all variables to be retained.

**Table 2.** Correlation between the independent variables and the dependent variable

| Variable | | Use of Electronic Resources | Information Literacy Skills | Attitude |
|---|---|---|---|---|
| **Pearson Correlation** | Use of electronic resources | 1.000 | .769 | .418 |
| | Information literacy skills | .769 | 1.000 | 303 |
| | Attitude | .418 | 303 | 1.000 |
| **Sig. (1-tailed)** | Use of electronic resources | | .000 | .000 |
| | Information literacy skills | .000 | | |
| | Attitudes | .000 | .000 | |
| **n** | Use of electronic resources | 303 | 303 | 297 |
| | Information literacy skills | 303 | 301 | 303 |
| | Attitude | 297 | 301 | 301 |

**Variance in the Use of E-resources Explained by Information Literacy Skills and Attitudes towards E-resources Use Scores**

The extent to which the two measures of information literacy skills and attitudes towards e-resources use predicted the use of e-resources by health sciences postgraduates in public universities in southwest Nigeria and the variance in the use of e-resources scores being explained by scores on the two scales of the independent variables are presented in Table 3. Looking at the model summary (Table 3), the value of R Square talked about how much of the variance in the dependent variable (use of e-resources) was explained by the model (which included the variables of information literacy skills and attitudes towards e-resources). In this case, the value was .143. This meant that our model (which included information literacy skills and attitudes towards e-resources) explained 14.3% of the variance in the use of e-resources.

**Table 3.** Model summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .378[a] | .143 | .137 | 1.98 |

[a.] Model Predictors (Constant) Information Literacy Skills, Attitudes to E-resources Use

[b.] Dependent Variable: Use of E-resources

**Best Predictor of the Use of E-resources**

The best predictor of the use of e-resources out of the two independent variables (information literacy skills and attitudes towards e-resources) is presented in Table 4. From Table 4, the largest Beta coefficient was .313, which is for attitudes towards e-resources use. This meant that this independent variable was the best predictor of the use of e-resources (dependent variable). Therefore, the attitudes

towards e-resources use made the strongest unique contribution to explaining the dependent variable when the variance explained by all other variables in the model is controlled for. The Beta value for information literacy skills was lower (.120), indicating that it made less of a contribution.

**Table 4.** Coefficients summary of information literacy skills and attitudes to e-resources use by health sciences postgraduates

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | **B** | **Std. Error** | **Beta** | **t** | **Sig.** |
| 1 | Constant | 14.227 | 1.678 | | 8.479 | 0.00 |
| | Information literacy skills | .026 | .013 | .120 | 2.045 | .042 |
| | Attitudes | .160 | .030 | .313 | 5.351 | 0.00 |

[a.] Dependent Variable: Use of e-resources

To assess the statistical significance of the result, it is necessary to look at Table 5 labelled ANOVA. The model in this study reached statistical significance (Sig. = .000; this means p is less than 0.05).

**Table 5.** ANOVA[a]

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 197.920 | 2 | 98.960 | 25.132 | .000[b] |
| | Residual | 1185.238 | 301 | 3.938 | | |
| | Total | 1383.158 | 303 | | | |

[c.] Predictors (Constant) Information Literacy Skills, Attitudes to E-resources Use
[b.] Dependent Variable: Use of e-resources

**Indicators of Attitudes towards E-resources Use having an Individual Significant Influence on the Use of E-resources**

The indicators of attitudes towards e-resources use that had an individual significant influence on the use of e-resources by health sciences postgraduates in public universities in southwest Nigeria are presented in Table 6. The results showed that only two indicators of attitudes - affective attitude ($\beta = 0.281$; $p < 0.000$) and cognitive attitude ($\beta = 0.214$; $p < 0.000$) - being less than 0.05 - had an individual significant influence on the use of e-resources by health sciences postgraduates in public universities in the southwest, Nigeria.

**Table 6.** Coefficients summary of attitudes towards e-resources use indicators and use of e-resources

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | **B** | **Std. Error** | **Beta** | **T** | **Sig.** |
| 1 | **(Constant)** | **3.952** | **1.549** | | **9.005** | **.000** |
| | Affective | .378 | .081 | .281 | 4.657 | .000 |
| | Behavioural | -.007 | .055 | -.008 | -.134 | .894 |
| | Cognitive | .261 | .072 | .214 | 3.599 | .000 |

**Indicators of Information Literacy Skills having an Individual Significant Influence on the Use of E-resources**

The indicators of information literacy skills that had an individual significant influence on the use of e-resources by health sciences postgraduates of public universities in southwest Nigeria are presented in Table 7. The results indicated that only two indicators of information literacy skills - information searching skills ($\beta = 0.186$; Sig. = 0.021) and use of information ($\beta = 0.156$; Sig. = 0.026) - being less than 0.05 - had an individual significant influence on the use of e-resources by health sciences postgraduates in public universities in southwest, Nigeria.

**Table 7.** Coefficients summary of information literacy skills indicators and use of electronic resources

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | **B** | **Std. Error** | **Beta** | **T** | **Sig.** |
| 1 | **(Constant)** | **19.576** | **1.488** | | **13.154** | **.000** |
| | Information Identification Skills | .085 | .087 | .075 | .985 | .325 |
| | Information Searching Skills | .169 | .073 | .186 | 2.322 | .021 |
| | Location of Information | -.030 | .069 | -.034 | -.445 | .657 |
| | Retrieval Skills | -.023 | .081 | -.020 | -.279 | .781 |
| | Evaluation of Information | -.028 | .064 | -.032 | -.436 | .663 |
| | Use of Information | .175 | .078 | .156 | 2.242 | .026 |

**Possible Effect of Gender and Programme of Study Control on Variance in E-resource Use**

The ability of the model (which includes information literacy skills and attitudes to e-resources use) to predict the use of e-resources scores, after controlling for a number of additional variables (gender, programme of study) is presented in Table 8. All characteristics in our study were divided into two sets. These were individually analysed using hierarchical multiple regression analysis. Since a conventional multiple linear regression analysis assumes that all cases are independent of each other, a different kind of analysis is required when dealing with nested data. This was why we applied hierarchical multiple regression for research question five. Hierarchical linear modelling allowed us to model nested data more appropriately than a regular or standard multiple linear regression. This involved entering the variables in blocks or steps in a predetermined order (not allowing the computer to choose). In the model summary tables, there are two models listed (Tables 8, 9 and 10). Model l included the first block of variables that were entered (gender and programme of study). Model 2 included all the variables that were entered in both blocks (gender, programme of study, information literacy skills, and attitudes to e-resources use).

Hierarchical multiple regression analysis was used to assess the ability of two control measures (information literacy skills, and attitudes to e-resources use) to predict the use of e-resources, after controlling for the influence of gender and programme of study. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. Gender and programme of study were entered in Step 1, explaining 9% of the variance in the use of e-resources. After entry of the information literacy skills scale and attitudes towards e-resources use scale at Step 2 the total variance explained by the model as a whole was 54.6%, $F(4,301) = 12.28$, $p < .05$. The two control measures explained an additional 49% of the variance in use of e-resources, after controlling for gender and programme of study, R squared change = .49, F change $(2, 301) = 159.73$, $p < .05$.

**Table 8.** Hierarchical multiple regression model summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | F Change | df1 | df2 | Sig. F |
|---|---|---|---|---|---|---|---|---|---|
| | **Change** | | | | | | | | |
| 1 | 172 | .091 | .086 | 4.78 | .091 | 8.463 | 2 | 302 | .000 |
| 2 | 436 | .546 | .541 | 3.36 | .489 | 159.732 | 2 | 301 | .000 |

**Table 9.** ANOVA results

| Model | | Sum of Squares | df. | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 620.032 | 2 | 41.384 | 2.863 | .000 |
| | Residual | 763.126 | 302 | 2.132 | | |
| | Total | 1383.158 | 304 | | | |
| 2 | Regression | 276.952 | 4 | 72.452 | 12.284 | .000 |
| | Residual | 1106.206 | 300 | 3.814 | | |
| | Total | 1383.158 | 304 | | | |

**Table 10.** Model coefficients

| | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|
| | **B** | **Std. Error** | **Beta** | **t** | **Sig.** |
| **Model 1** | | | | | |
| (Constant) | 29.096 | .796 | ----- | 27.302 | .000 |
| Programme of study | -.497 | -.150 | -.204 | -3.712 | .000 |
| Gender | -.042 | .034 | -.031 | -1.126 | -162 |
| **Model 2** | | | | | |
| (Constant) | 42.922 | 1.269 | ----- | 34.012 | .000 |
| Programme of study | -.157 | .106 | -.064 | -1.201 | .182 |
| Gender | -.032 | .018 | -.056 | -1.124 | .324 |
| Information literacy skills | -.638 | .073 | -.347 | -8.374 | .000 |
| Attitudes to e-resources | -.159 | .033 | -.268 | 5.263 | .000 |

From Table 10, the β coefficients for the constant and four predictors of the use of e-resources were as follows; Constant β=42.922, t=34.012, p=.000: significant; Programme of study, β=-.157, t=-1.201, p=.182: not significant; Gender, β=-.032, t=-1.124, p=.324: not significant; Information literacy skills, β=-.638, t=-8.374, p=.000: highly significant; Attitudes to e-resources use, β=-.159, t=5.263, p=.000: highly significant.

In the final model, only two control measures were statistically significant, with the information literacy skills scale recording a higher beta value (beta = -.35, p< .05) than the attitudes to e-resources scale (beta = -.27, p< .05). The best fitting model for predicting use of e-resources from the above analysis would be the linear combination of the constant, information literacy skills and attitudes towards e-resources use.

*The Model*

$Y(\text{Use of e-resources}) = \beta_0+\beta_1(\text{Information literacy skills})+\beta_2(\text{Attitudes towards e-resources use})$

Where, $\beta_0$, $\beta_1$ and $\beta_2$ are respectively 42.922, -.638 and -.159.

## Discussion

### Predicting the Use of E-resources by Health Sciences Postgraduates – PPMC and Multiple Linear Regression Outcomes

The use of e-resources explanatory variables considered in this study was information literacy skills and attitudes towards e-resources use [together with their different indicators]. The results of the regular or standard multiple linear regression analysis demonstrate that, of these variables, attitudes towards e-resources use - limited here to affective, behavioural and cognitive - was the best predictor of the use of e-resources (dependent variable). Nonetheless, information literacy skills were lower compared to attitudes towards e-resources use, indicating that it makes less of a contribution to the use of e-resources use. Because attitude is an indication of the user's perspective and assessment regarding positive or negative responses concerning an idea or object (Vargas-Sanchez et al., 2016) and also affects the psychological mindset of the user determining behavioural disposition towards a case (Fishman et al., 2021; Leonard, 2019) as well as the explanatory variable (attitudes towards e-resources use) being the best predictor of e-resources use by health sciences postgraduates, the impact of these findings become all too evident. In this study, we have demonstrated the significance of acceptance, affirmation, certainty, characterised presence and constructive quality that suitable attitudes can bring to the use of e-resources. The study further illustrated that out of three indicators of attitudes towards e-resources use, affective attitude and cognitive attitude had an individual significant influence on the use of e-resources by health sciences postgraduates. The self-reported optimistic data on the affective component of attitudes point to how respondents feel using e-resources - it depicts the high-level emotions, feelings and moods that they attach to the use of e-resources. Furthermore, the results on the relevance of the cognitive aspect of attitudes indicate that postgraduates have a pragmatic general knowledge about the

use of e-resources. Due to this cognition, they are most likely going to be capable of weighing the applicable qualities and usefulness of e-resources - positively affecting usage. This is consistent with previous research that the use of e-resources is associated with the attitudes of the users towards the object (Jbeen et al., 2022; Kaur, 2018; Okunoye, 2018). Users in these studies demonstrated that their use of e-resources including e-databases and e-books are connected to some reliable qualities such as ease of finding information and the assistance given by e-resources in completing tasks encouraging positive attitudes regarding e-resources utilisation. Our results appear to be a contradiction with Wang and Bai (2016). Wang and Bai studied postgraduates who reported low attitudes towards the use of e-books negatively affecting e-books adoption and acceptance due to the period of e-book evolution. The study of Wang and Bai compared to our study apparently points to further investigation to understand the difference that the nature of expansion or diversification and provision of e-resources and the user-friendliness of e-resources interfaces bring to the use of e-resources.

Happening at the same time in the study as seen from the analyses, the scales of both information literacy skills and attitudes towards e-resources use correlate substantially with the use of e-resources judging from statistically significant relationship and correlation coefficient values. The results from this study show that the respondents affirm individual factors related to users such as information literacy skills and attitudes towards e-resources use affecting the use of e-resources (Ahmed, 2013). This discovery becomes important in this study irrespective of whatever contributions the explanatory variables (information literacy skills and attitudes towards e-resources use) impart on the response variable (use of e-resources).

Overall, the contribution of information literacy skills and attitudes towards e-resources use considered in this study was about 14 per cent of the variance in the use of e-resources based on standard multiple regression. This means that information literacy skills and attitudes towards e-resources use account for a seventh of the variance in the use of e-resources. From the multiple regression analysis, information literacy skills contributed the least in terms of predicting the use of e-resources. However, two of the indicators of this construct had an individual significant influence on the use of e-resources. This is a result that cannot be ignored as the information searching skills and the use of information by this category of postgraduate students play an important role in the use of e-resources helping students to further develop their information literacy skills. These results are consistent with other similar studies (e.g., Adeleke & Emeahara, 2016; Akuffo & Budu, 2019; Ankrah & Atuase, 2018; Imsong & Kharbudon, 2016; Ruzegea & Msonde, 2021; Ugwulebo & Okuonghae, 2021). These studies reiterate the urgency that should be attached to search technique skills and the use of information that the knowledge and experience about e-resources can bring as critical aspects of information literacy skills. This study also reemphasises the good and earlier-in-time recommendation of Ndubuisi and Udo (2013) concerning the implementation of an information literacy instruction strategy for postgraduates targeted at enhancing searching skills to boost the use of e-resources.

**Hierarchical Multiple Regression Analysis Outcome**

Hierarchical multiple regression analysis after controlling for the possible effect of gender and programme of study found that there were two dominant predictors of the use of e-resources among health sciences postgraduates of public universities in southwest Nigeria. They were information literacy skills and attitudes to e-resources use. This result is consistent with some separate studies in extant research where the explanatory variables of the current study though not jointly studied in these studies proved to have affected the enhanced use of e-resources by postgraduate students. They include studies such as Acheampong et al. (2020), Adeleke and Emeahara (2016), Ruzegea and Msonde (2021) and Tandi Lwoga and Sukums (2018) related to information literacy skills and use of e-resources and Kaur (2018) and Okunoye (2018) connected to attitudes and use of e-resources. Additionally, these studies are associated with science-based respondents including health-related disciplines. Assuredly, the combined study of information literacy skills and attitudes towards e-resources use in connection to the use of e-resources by health sciences postgraduates is one of our study's contributions to the field of library and information science and related disciplines. Thus, first, it is required that these students be assisted to have improved positive attitudes and the augmentation of information literacy skills, in so doing, their use of e-resources will be enhanced. Second, many lecturers, librarians, researchers and

policymakers could have the impression that the programme of study and gender may further affect information literacy skills and attitudes towards e-resources use as they predict the use of e-resources. This study has proved otherwise. Consequently, irrespective of the programme of study and gender, unbiased provision must be made by stakeholders regarding provisions for the explanatory variables to improve the use of e-resources by the students.

This study makes an empirical contribution by advancing the research of information literacy skills, attitudes towards the use of e-resources and the use of e-resources among health science postgraduates. Only a few related studies have been published so far on this category of postgraduate students (e.g., Adeleke & Emeahara, 2016; Ruzegea & Msonde, 2021). Comparably, the present study brings to light the few things that are known and further reveals new associations between the independent variables and the dependent variable regarding health sciences postgraduates. The study also provides practical implications. As the health sciences postgraduates demonstrate quite an appreciable attitude towards the use of e-resources and significant information literacy skills, the study offers a positive signal regarding the interest of postgraduates in the use of e-resources and a worthwhile opportunity to maintain the instruction and teaching of information literacy skills in academic libraries and library schools. Furthermore, the study implies that there is a high probability that health sciences postgraduate research will be enhanced as more e-resources will be engaged for research. This makes the high spending on e-resources acquisition in many universities to be justified (Adeleke, 2021; Ankrah & Atuase, 2018; Fingillah, 2023; Hong & Jo, 2017; Joshua & King, 2020; Mollel & Mwantimwa, 2019; Olajide & Omolehin, 2021; Shaibu & Mohammed, 2017; Shoaib et al., 2022).

## Limitations and Future Studies

Despite all the efforts made to undertake painstaking research, certain limitations to this study could not be addressed due to resource and time constraints. The first limitation of the study is that the generalisability of the results is limited by the small sample size. Second, is that respondents were not randomly selected. Finally, although the current study utilised a quantitative approach, however, as all surveys employing only a questionnaire would do, generalisation to all health sciences postgraduates in other regions apart from southwest Nigeria, other regions' public and private universities and all climes may not be applicable. Nonetheless, the sample size is representative of the population of the studied context, considering a stance such as Krejcie and Morgan (1970) on the sample size for research activities. However, this study would provoke further studies. Since the study is on public universities, it will be good to also conduct a similar research in private universities to compare results assisting with a better generalisation to health sciences postgraduates in Nigeria. Therefore, future studies should be purely qualitative employing the use of other instruments such as an interview guide and focus group. This could add a rich dimension to the study.

Since our results show that only two indicators of information literacy skills (information searching skills and use of information) have a significant influence on the use of e-resources, increasing the sample size of health sciences postgraduates might enhance the power of the analysis to detect relationships between the study variables. Furthermore, attitudes towards e-resources use should be exhaustively studied because it is the best predictor of the use of e-resources as uncovered in this study. Ascertaining the construct of attitude towards e-resources use will have far-reaching effects on how health sciences postgraduates communicate and collaborate, and how daily tasks and responsibilities are performed.

## Conclusion

In conclusion, we emphasise the importance of enhanced and sustained positive attitudes towards e-resources use and continuous information literacy skills development programmes in higher institutions to further encourage the use of e-resources by health sciences postgraduates - this is regardless of the fact that they are postgraduate students. There cannot be an assumption in this matter that since they are a mature set of students, then their positive attitudes and information literacy skills can be considered of high levels - maintaining a high pace of the explanatory variables is sacrosanct for increased use of e-resources by health sciences postgraduates. In this digital age, this study also reiterates the standpoint of Mohammed (2015) and Shoaib et al. (2022) concerning the employment of e-resources to render

effective library services to satisfy the information needs of many of these postgraduates who may be digital natives. This will enable them to utilise more e-resources in their academic activities, particularly research. This will in turn solve the problem of scientific knowledge discovery that is a present challenge to health science postgraduates (Kalanat, 2022).

## Recommendations

The study recommends the following:

- Sustained institutional programmes to further raise and maintain information literacy skills awareness/application and boost postgraduates' attitudes towards electronic resources use must be implemented since they are statistically significant in determining electronic resource use. Results from the inferential analyses [regression results] reveal the importance of information literacy skills and attitudes towards e-resources use in the use of electronic resources. These programmes must cut across all levels of health sciences postgraduates irrespective of gender and programme of study.
- Regarding the organised programmes, affective and cognitive attitudes must be deliberately addressed for continuous advancement of the students since attitudes towards e-resources use makes the strongest unique contribution to electronic resource use. This can come by the way of the development of well-directed curriculum and policies for students to inculcate these variables.
- Institutions must step-up to further enhance health sciences postgraduates' skills in information searching and the use of information. These skills are identified as having significant influence on electronic resources use. To advance postgraduate research, students must be able to search, obtain and use information appropriately. Institutions through interactive workshops, seminars, lectures and small group/one-to-one support must create information literacy assistance to meet the information search and use needs of health sciences postgraduates. Training can also involve helping students build skills in identifying and accessing appropriate sources, execute constructive information management, and the use of digital tools and technologies.

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**Footnotes**

The link to the questionnaire of this study can be obtained at https://www.dropbox.com/scl/fi/q0qhm2kvgyjgdo3g5u1pr/Information-Literacy-Skills-and-Attitude-of-Health-Sciences-Postgraduate-Students-as-Determinants-of-Use-of-Electronic-Resources-Questionnaire-ILSAHSPSDUERQ.docx?rlkey=bv7mqfcpqagc0x8rjlqnwxjpz&dl=0.

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