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MHD: MENTAL HEALTH DIRECTORY FOR NIGERIAN SCHOOLS

Cecilia Omeiza

Department of Computer Science, School of Science, Federal College of Education, Okene, Kogi State. E-mail: comeiza4@gmail.com

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ABSTRACT: *Nigeria has been considered to have the highest number of depression cases in Africa. Young people, such as secondary school students are not exempt. While this is meant to be a serious public health concern, topics around student mental health are still largely ignored. In fact, there exist little or no efforts around the deployment of technological tools to propagate knowledge and create awareness among students in many local communities. In this paper, I propose Mental Health Directory (MHD), a knowledge repository about mental health to help secondary schools better assist teachers and students who might want to learn more about mental illnesses in schools where the internet is not accessible. MHD was developed through the application of information retrieval theories to source and aggregate content from verified online sources. MHD is made publicly available online[1] and offline for schools to utilise for the aforementioned benefit, and as well as a teaching aid, and support for students who might likely be suffering from mental illnesses.*

KEYWORDS: Information Retrieval, Web Application, Mental Health, Education

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INTRODUCTION

For the most part of human civilisation, people have been making efforts to gain a better understanding of their physical health, and consequently, control physical factors that influence physical health. While tremendous efforts have been channelled toward physical health, the ultimate goal of feeling healthy and reducing mortality rate is still challenged by the increasing mental health concerns and challenges in developing countries, such as Nigeria (Oyetunji et al., 2021). Recent occurrences, such as the COVID-19 pandemic, economic hardship, and increased out-of-school time for students due to strikes are taking a toll on the mental health of Nigerians. In fact, people are more depressed and some resort to suicide (Aborode et al., 2022). While there are efforts toward sensitisation of mental wellness from a few non-governmental agencies in Nigeria, traditional societal beliefs and stigmas hamper the efforts of these organisations as topics around mental wellness are considered taboo in many communities in Nigeria. This is a serious challenge that has cascaded effects on students' learning in schools. With the aim to contribute to the effort towards mental health sensitisation, I provide a mental health directory (MHD), a mental health offline and knowledge repository for secondary school teachers and students in Nigeria. MHD helps teachers to better understand students' mental health conditions and provide necessary assistance. It is a collection of online resources (e.g., website URLs, videos, manuals, blog posts, among others) from approved mental health organisations, therapists, and related experts. The deployment of this tailored repository in Nigerian schools would potentially help to improve awareness around mental health among young people, assist students suffering from related ailments, and consequently, reduce suicidal rates. In addition, this research makes contributions to research by making a new use case for the use of information retrieval technology (Kobayashi & Takeda, 2000) in mental health awareness creation in Nigerian schools.

LITERATURE/THEORETICAL UNDERPINNING

Previous studies have investigated school children and students' mental health needs. For example, Dogra et al. (2012) assessed teachers' perceptions of children's mental health needs and mental health resources and programmes available in schools in South-West Nigeria using focus group discussions. Upon analysis of the comments from teachers, significant issues, such as limited understanding of mental illnesses, and the predominant use of physical punishments on children who show traits likened to mental health illnesses were reported. A good number of the teachers were of the opinion that schools are important avenues for addressing mental health problems in children and that teachers are in the best position to identify these issues.

Recently, technological provisions, such as the internet, social media and mobile technologies are being considered as promising avenues to facilitate young people's pathway to mental healthcare and to complement the services they receive in person (Lal et al., 2018). Lal et al. (2018) used a qualitative approach using the focus group method was used to analyse the experience and perspective of young people on the use of online information for mental health issues. It was discovered that a lot of young people use the internet to obtain information, support as well as treat mental health problems and challenges. A related study (Susan et al., 2021) aimed to synthesize the current evidence on digital health interventions targeting adolescents and young people with mental health conditions, with a focus on effectiveness, cost-effectiveness, and generalizability to low-resource settings (e.g., low- and middle-income

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countries). It was discovered that digital interventions for mental health could be effective for both supplementing and supplanting traditional mental health treatment. However, it was noted that only a small proportion of existing digital platforms are evidence-based. In any case, where the traditional systems are inadequate, technological interventions are valuable. Online platforms could offer students many benefits, among which is a sense of privacy, reduced feelings of embarrassment, increased feelings of comfort, control in self-expression, and a reduced sense of emotional exposure (Burns et al., 2010).

Previous studies (Burns et., 2010; Levin et al., 2016) on web-based mental healthcare assume the presence of an already established internet infrastructure. Meanwhile, in local communities in Nigeria, information technology skills and access to the internet are very limited. Hence, the need for the aggregation of web-based resources for both online and offline utilisation is critical.

METHODOLOGY

This research proceeded in four steps:

First, I explored relevant mental health organisations in Nigeria, such as Mental Awareness Nigeria Initiative (MANI) to collect a list of common mental illnesses in Nigeria (available on MANI's website).

Second, a systematic curation of search queries related to the 20 mental illnesses listed was conducted. An example query to obtain search URLs for addiction symptoms is "How do I know that I am an addict?". I expected that this query on the Google search engine would provide a useful list of websites/blogs/videos (see Table 1).

Table 1: Volume of content collected.

	Number of Unique URLs			
Number of Conditions	General Information	Causes	Symptoms	Treatments
20	83	73	85	111

Third, I developed a web scrapping tool to automatically access and scan through the list of websites and retrieve useful information, which I stored in our database. I only added information from verified websites.

Finally, I built a responsive web app that can be rendered on a computer screen or mobile phone screen with or without internet connectivity. Figure 1 provides a high-level architecture of the system. I discuss each component in detail in Figure 1.

Information Engine

The is responsible for web scraping and the storage of web pages obtained via URLs. The information engine comprises the 'URL Retriever' and the 'Content Retriever' modules. The

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URL Retriever aggregates URLs (saved in a JSON file) obtained from the execution of the set of curated search queries. The retrieved URLs are organised along with their corresponding queries in a JSON file. The 'Content Retriever' processes the JSON file and obtains the content in the webpage that the URL points to. This data is organised in folders (based on URL categories) and stored in a local document-based database. The overall process involves multiple steps, including automated search, web crawling, data extraction, and data storage.

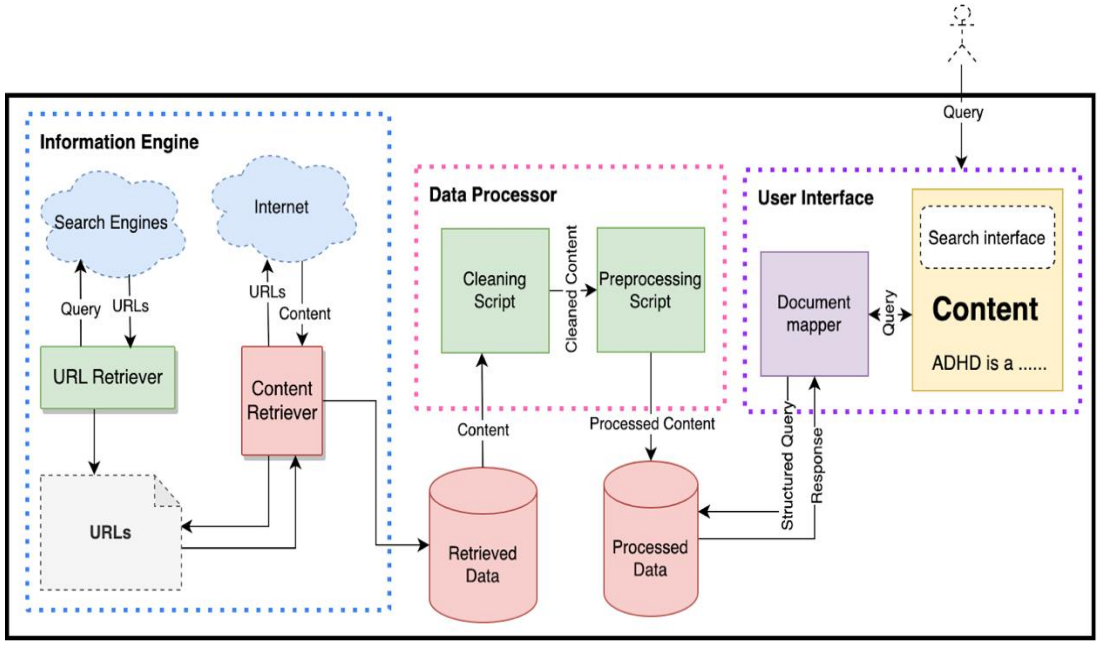

Figure 1: High-level architecture of the mental health directory software.

Data Processor

The data processor retrieves the stored web data organised in folders and processes it for better presentation on a webpage. It comprised the 'Cleaning Script' and the 'Preprocessing Script'. The 'Cleaning Script' upon execution obtains data from the 'Retrieved Data' database and removes unwanted HTML tags, such as <script></script>, <link/>, <img/>. The resulting webpage is then sent to the 'Preprocessing Script' that extracts only elements with class="main-content" and class="content-area" for a more consistent result. In some cases, manual find and replace operations were necessary to extract consistent main content across all aggregated sites. Subsequently, the cleaned web content is stored in the "Processed Data" storage. For each processed data instance stored, a json object is created which contains the page title, web URL, and local path of the preprocessed data instance. This is necessary for easy access.

User Interface

The user interface relies on a 'Document mapper' to map HTTP GET requests from the client to the data stored in 'Processed Data Storage'. As the frontend interface is equipped with robust search functionality, different types of client requests are expected. This 'Document mapper' is able to interpret this request and retrieve the appropriate content for the user. The search

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functionality is able to filter content from the storage based on user queries. The interface has an accordion sidebar on the left pane with items grouped based on the different mental illnesses. Items are displayed on the accordion as hyperlinks with corresponding webpage titles and URLs obtained from the JSON file. The frontend application was developed using ReactJS and ReactBootstrap. Hence, it is responsive, ensuring consistent performance across various devices and screen sizes. The implementation leverages modern web development techniques and technologies to deliver an efficient and user-friendly experience (see Figures 2,3, and 4).

RESULTS/FINDINGS

This demonstrates how the software works by explaining the user journey through the different interfaces. The user launches the software from the Desktop and uses the search bar to search for a condition, symptom, or whatever the user is interested in searching for. The search provides results as a list ordered in terms of relevance (see Figure 2). The user clicks on an item on the search result and the corresponding content is displayed on the page (see Figure 3).

Aside from the accordion on the left pane, additional buttons, such as ‘Causes’, ‘General Symptoms’, ‘Symptoms’ and ‘Treatment’ buttons are provided to help the user navigate easily within the content already rendered on a page (see Figures 3 and 4).

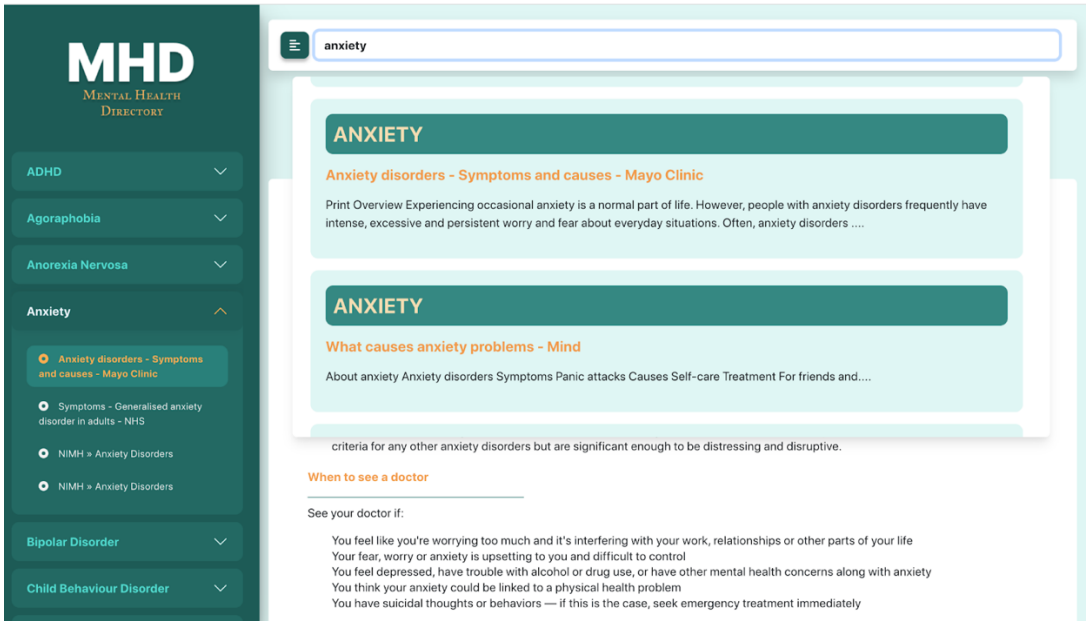

Figure 2: Search functionality display of the mental health directory software.

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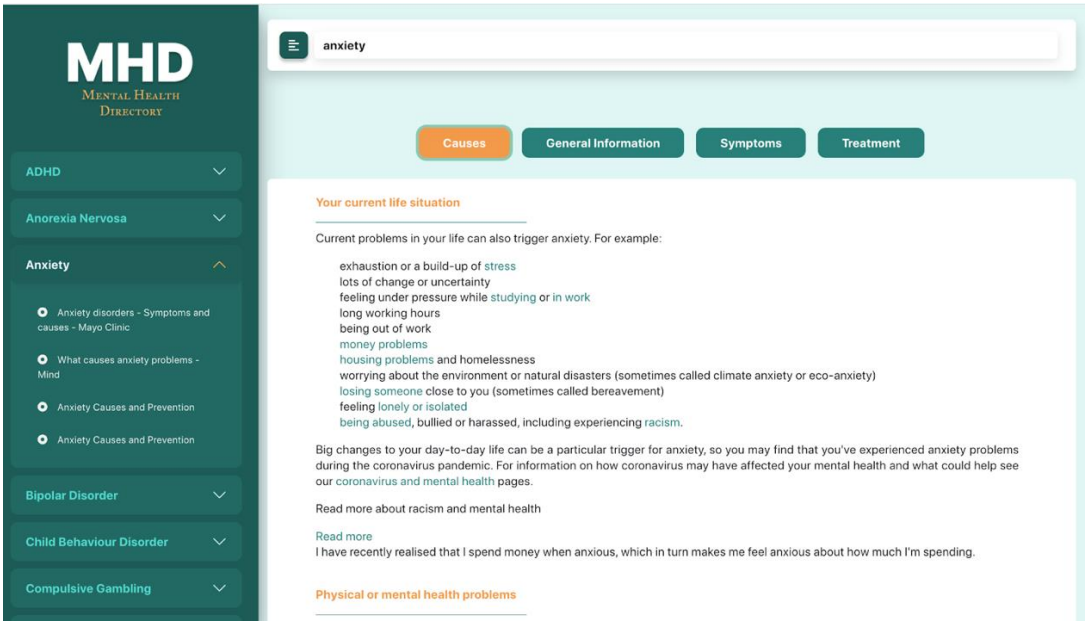

Figure 3: Mental health directory software displays content for the selected item in the search result.

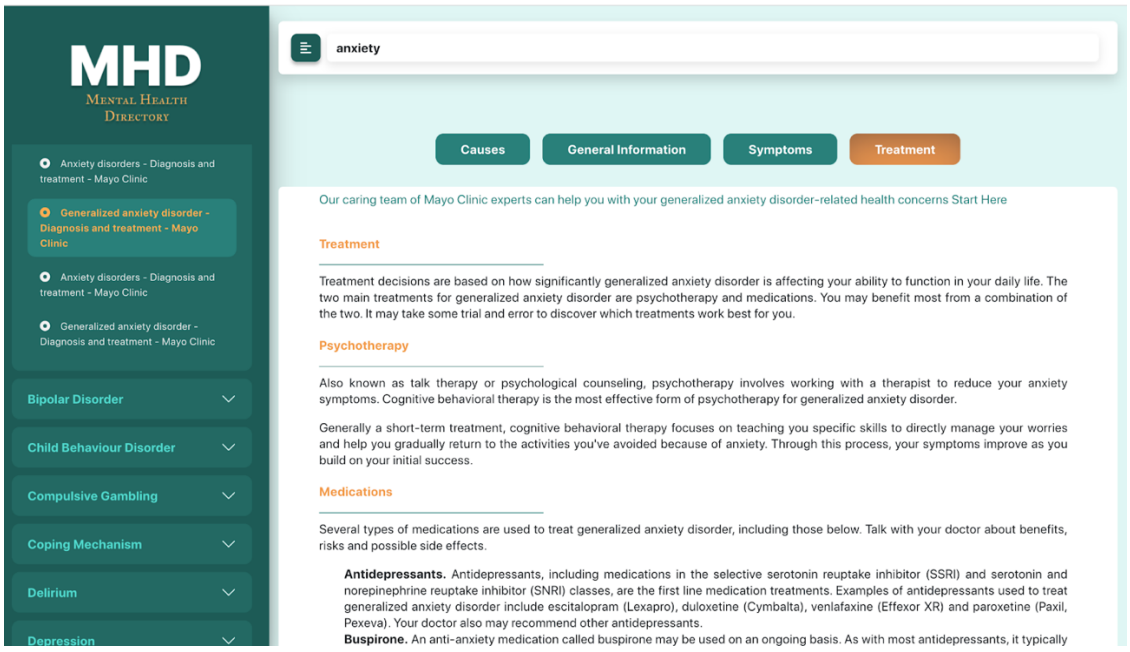

Figure 4: Users can easily navigate content using the 'Causes', 'General Symptoms', 'Symptoms' and 'Treatment' buttons and the menu on the left pane.

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CONCLUSION

This paper argues that mental wellness is an important aspect of human well-being. It identified the challenges associated with mental health efforts in Nigeria, which include the lack of adequate attention on this topic in Nigerian schools, the absence of awareness creation around the topic, and the dismissal of the topic as taboo within many communities. This has led to increasing mental illnesses, such as anxiety, depression, ADHD, addiction, among others, with some leading to suicide. To contribute to the efforts, I have proposed a mental health directory (MHD) which is an online and offline knowledge repository aimed at sensitising teachers and school students and/or pupils on the mental issues predominant among young people in Nigeria, especially where internet accessibility is low. Concepts from the information retrieval domain were applied in building this solution. MHD has a highly responsive interface with robust search functionality for easily navigating content. hope that this research and solution serve as a pathway to better mental healthcare in Nigerian schools.

Future Research

As future research, I would investigate the usefulness and impact of this system through surveys and interviews in different schools where they are deployed.

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