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**SOCIAL INEQUALITIES AND THE ADOPTION OF HEALTH MISINFORMATION
IN CAMEROON: IMPLICATIONS ON HEALTH BEHAVIOUR**

Sub-Theme: Group based inequalities, Disparities in socio-demographic outcomes

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ABSTRACT

Public health restrictions in response to the COVID-19 pandemic resulted in an increase in the reliance on social media for peer interactions. This resulted in the proliferation of medical misinformation and conspiracy theories that undermined public support for disease control measures, and influenced negative health attitudes such as vaccine denial. The aim of this study was to determine how social inequalities influence the adoption of health related misinformation, and the extent to which the adoption of health misinformation results in poor health behaviours. The study employed an exploratory survey design, and relied on both quantitative and qualitative methods to collect and analyse data. A stratified sample of 480 participants was employed to select respondents to questionnaires in two urban and rural areas of Cameroon. The results suggested that, the adoption of health related misinformation was significantly higher among females than in males, with wide contrasts in the rate of adoption between urban and rural populations. Social factors such as education level, income status and language were also shown to influence the adoption of health misinformation with rates of adoption significantly higher among low income, rural dwellers and less educated members of the population. Social factors were shown to determine the extent to which health misinformation influenced the formation of opinions and habits, and there was a significant contrast across sample sets employed in the study. Negative attitudes influenced by misinformation were determined to include mistrust for health authorities, disease denial, vaccine hesitancy, vaccine refusal, hospitalisation refusal and mistrust for public health authorities.

Key Words: *COVID-19, Disinformation, Information Manipulation, Disease denial, Vaccine hesitancy, Vaccine denial*

1.0 Introduction

The last few years has seen the world thrown into near chaos due to the raging COVID-19 pandemic. In response to enforced isolation due to public health restrictions, people resorted to social media for peer interactions. This included the dissemination of health information. Communication is more effective on social media because it takes advantage of the interactive nature of social media spaces to reach wider audiences. The pandemic resulted in unprecedented exposure to voluminous amount of information such as new public health guidelines, disease information and epidemiology, research information, and opinions, in addition to distorted information such as conspiracy theories, rumours, myths, falsehoods and fake news (Murthy, 2021) which experts have described as the infodemic (La Moro et al., 2022). The term infodemic describes the difficulty in figuring which information sources are credible, which information is factual and how to keep up with rapidly changing information amid an abundance of available information (Murthy, 2021). In the infodemic therefore, the visibility of reliable and accurate information is impeded due to the proliferation of altered or distorted information.

Information distortion is not a recent phenomenon and has always been employed to sway public opinion or rouse support for a cause (Wardle & Derakhsan, 2017). Susser et al. (2019) define information distortion as the exploitation of channels of information to covertly influence people, institutions and systems. It refers to the tendency of information to be altered, omitted or reorganised during communication to suit the covert objectives of the sender (Passmore, 2015). Information distortion relies on its ability to provoke emotional reactions to sensational topics and often exploits existing sensationalism on prevailing issues to propagate alternative facts which tend to spread more rapidly than genuine information (Langnin, 2018). Social media has emerged as the ideal vehicle for distorted information and enables easy access to information at little or no cost (Shu et al., 2017; Stahl, 2018)

Wardle and Derakhsan (2017) identified three major types of distorted information which are: misinformation, disinformation and mal-information

- Misinformation refers to false information that is unknowingly shared without the intention to harm (Ireton & Posetti, 2018; Wardle & Derakhsan, 2017).

- Disinformation is a sustained, organised, deliberate and well organised effort to create and disseminate false information with the intention of misleading public opinion (Ireton & Posetti, 2018; Wardle & Derakhsan, 2017).
- Mal-information refers to accurate information that is deliberately used out of context and communicated with the intention of misleading public opinion (Ireton & Posetti, 2018; Wardle & Derakhsan, 2017).

Brun and Roitman (2020) explain that widespread distortion of information has resulted in the blurring of the lines between truth and reality, and has made it more difficult to ascertain truth and clarify reality due to the existence of several competing truths. Scholars have used the term post-truth to describe the current era of competing alternate realities due to the spread of false information. Brun and Roitman (2020) outline four major characteristics of the post-truth world:

- The existence of deliberate, sustained, coordinated and resourced efforts to create and share false information
- There is increasing difficulty in verifying facts and distinguishing between truth and falsehood.
- The erosion of trust and confidence in institutions and systems due to blurred lines between truth and falsehood.
- Increasing polarisation and politicisation about what qualifies to be truth.

1.2 Context of the Study

Cameroon is a low middle income central African country with a population of over 28 million people. In Cameroon, healthcare provision is a combined effort of the government, religious organisation and the private sector. The country has over 5,166 registered health units of various categories in 181 health districts. This amounts to 2.19 hospitals for every 10,000 people, far below prevailing standards across the world (Dingha, Sinda & Titanji, 2021). In the course of the COVID-19 pandemic Cameroon had registered 1935 deaths from 122,000 cases by April 2022 (WHO, 2022) even though experts suggest the real number may be higher due to inefficiencies in medical reporting. In response to the pandemic, the Ministry of Health issues a set of guidelines and public health restrictions to limit the spread of the virus, among which were several mass vaccination campaigns. However, vaccine uptake has been low in Cameroon with WHO (2022) estimating that only 1,854,436 doses of COVID-19 vaccines had been

administered by April 2022 amid the availability of several million vaccines through bilateral relations with China, and through multilateral efforts such as COVAX.

1.3 Research Problem

Public health restrictions in response to the COVID-19 pandemic resulted in an increase in the reliance on social media for peer interactions. This resulted in the proliferation of medical misinformation and conspiracy theories that undermined public support for disease control measures, and influenced negative health attitudes such as vaccine denial. However, vaccines have contributed to the decline of communicable diseases (Catalan-Matamoros & Elias, 2020) especially in Cameroon and Africa. Catalan-Matamoros and Elias (2020) pointed to false information about vaccines and the pandemic as a reason for low vaccine uptake in Africa. Anjorin et al. (2021) in a study of 34 African countries could establish that social media was a major channel in the spread of distorted health information and that it contributed to vaccine hesitancy and public health mistrust. Similarly, Kollamparambil et al. (2021) concluded from studies conducted in South Africa that health disinformation and misinformation resulted in low vaccine uptake and informed other poor health attitudes such as hospitalisation refusal and health system mistrust.

Inadequate scrutiny in mass media has also been responsible for the dissemination of some health misinformation and disinformation especially in relation to vaccines (Catalan-Matamoros & Elias, 2020). In Africa, vaccine hesitancy is a critical issue with only 1% of its estimated 1.3 billion people vaccinated a rate much lower than in the rest of the world (Catalan-Matamoros & Elias, 2020, (Edwards et al., 2021). Vaccine hesitancy is even a bigger challenge in Cameroon, with Dingha, Sinda & Titanji (2021) estimating the vaccine hesitancy rate at 84.6% well above the African average of 78.1% (Sallam, 2021).

Studies on information distortion have focused on implications of the phenomenon on security and electoral outcomes with less emphasis on public health. Furthermore, most existing studies that examine the information distortion-health nexus were conducted in Europe and Asia (La Moro et al., 2022; Catalan-Matamoros & Elias, 2020; Ruiz & Bell, 2021), with few in Africa and Cameroon in particular. Existing studies on issues such as vaccine hesitancy in Cameroon did not specifically seek to establish a connection with information distortion (Dingha, Sinda & Titanji, 2021), and the data used has aged significantly given the rapid progression of the

COVID-19 pandemic. While some studies could establish public health outcomes as a direct consequence of the distortion of health information, they did not explore the variation between social groups on the extent of distorted information adoption and public health outcomes.

In the light of the contextual gaps identified in the literature above, it is therefore compelling to investigate the potential influence of social inequalities on the adoption of distorted information and to assess how distorted information influences health behaviour across social groups.

1.4 Aim and Objectives of the Study

The aim of this study was to determine how social inequalities influence the adoption of distorted health related information, and the extent to which the adoption of distorted health information results in poor health behaviours. Specifically, the study had the following objectives:

- To understand the concept of health misinformation as pertains to Cameroon.
- To determine the social factors that influence the adoption of distorted health information in Cameroon
- To examine the extent of adoption of distorted health information across social groups.
- To identify the implication of the adoption of distorted health information on health behaviour.

1.5 Research Questions

The study sought to provide answers to the following research questions:

- What is the dynamics of health misinformation in Cameroon?
- Which social factors influence the adoption of distorted health information in Cameroon?
- How does the adoption of distorted health information vary across social groups?
- What are the implication of the adoption of distorted health information on health behaviour in Cameroon

1.6 Assumption

This study was conducted on the assumption that all distortions to health information were misinformation, and some other type of information distortion.

1.7 Literature Review

Social media has become an integral aspect of modern life (Wilson et al., 2013) and its usage increased significantly during the pandemic, possibly due to the restrictions on person to person contact (Saud, Mashud & Ida, 2020). The increased use of social media during the pandemic increased the spread of false information about vaccines, the origin of the coronavirus, the side effects of vaccines, vaccine efficacy and the appropriate medical response to infection with the coronavirus (Pennywok et al., 2020). Vaccination became the focus of social media discourse and this resulted in the dissemination of distorted information about vaccines and the purposes of vaccination campaigns.

Murthy (2021) identified three characteristics of social media that enhances its suitability for disseminating distorted information. Firstly, social media allows distorted information to be framed in a sensational and emotional way that provokes anxiety and enables its rapid spread. Secondly, the product features of social media have contributed to information distortion by supporting more favourable responses (likes, retweets, comments, views) to false information than objective information. Emotionally charged subjective and false information tends to spread faster than objective information possibly because it elicits more reactions and traction than genuine information (Wang et al., 2-17). Lastly, algorithms that determine what users see are based on popularity, as such popular information is likely to have higher visibility and go viral as opposed to genuine information.

Another thing that makes social media ideal for spreading false information is its decentralised nature which allows for information to be published without any form of censorship prior to publication (Meleo-Erwin, 2017). This makes health information literacy critical to effective exploitation of health information in the digital age. Norman and Skinner (2006) define health information literacy as the ability to seek, find, understand and evaluate health information for its exploitation in addressing health challenges. Health information literacy is responsible for the critical evaluation of health information and the discernment of health information (Hsu, Chiang & Yang, 2014) and determines the extent to which distorted health information is adopted.

The implications of health misinformation and the dissemination of manipulated or distorted health information on health outcomes cannot be over emphasized. Information distortion informs individuals adoption of new beliefs on the basis of adopted false information and this

has often resulted in new behaviours and practices (Boyle & Purdon, 2019). Some of health behaviour that have been the interest of scholarly inquiry in relation to distorted information include disease denialism, public health authority mistrust, hospitalisation refusal and vaccine hesitancy.

Vaccines are the most important tool for tackling diseases and reducing the mortality and morbidity associated with infectious disease. The importance of vaccines to the attainment of public health objectives has made the problem of vaccine hesitancy to emerge as one of the most potent threats to global health today (Shah et al., 2022). The World Health Organisation (WHO) defines vaccine hesitancy as the reluctance or refusal to vaccinate despite the availability of vaccines (W.H.O., 2009). According to Wilson and Wiysonge (2020), within the context of the COVID-19 pandemic, the distortion of health information greatly contributed to vaccine hesitancy and low vaccine uptake rates.

As the pandemic raged, vaccinations emerged as the most effective public health response to limit the spread of the virus (Boyle et al., 2019) however, an abundance of distorted information about vaccines was wildly disseminated on social media. Several studies have explained how conspiracy theories about the virus and vaccines helped contribute to vaccine hesitancy. This includes rumours peddled about microchips in vaccines which could be used to remotely control vaccinated persons and rumours which suggested that vaccines will lead to infertility and other adverse side effects in vaccinated persons (Lucia, Keleker & Afonso, 2021; Sallam et al., 2021). Salali and Uysal (2020) also identified several pieces of false information about the origin of the COVID-19 virus. In some countries, vaccine hesitancy was informed by religious sensitivity and this was often exploited by creators of health disinformation to sustain campaigns aimed at reducing vaccine uptake among religious adherents (Ruiz & Bell, 2021). The implications of false information about the virus and vaccines greatly affected decision and resulted in low vaccine acceptance (Shah et al., 2022).

Beyond vaccine hesitancy, another challenge as an outcome of health misinformation has been disease denialism. Long before the COVID-19 pandemic, the distortion of health information was established as a major determinant of disease denialism. In the late 1990s, misinformation led to AIDS denialism in South Africa and contributed to the avoidable death of over 300,000 people (Chigwedere et al., 2008).

Information distortion has also been identified to be responsible for the radicalisation of domestic audiences, the erosion of citizen's trust in institutions and the limitation of institution's ability to address society's problems (Polyakova & Fried, 2019). Prior to the advent of the internet and social media, medical information was mostly the preserve of medical professionals. The promise of better healthcare due to enhanced access to medical information is now challenged by the reality of information distortion and its implications on public health especially since it results in widespread mistrust of public health authorities. La Moro et al. (2022) opined that false health information has led people to believe that preventive health measures to tackle the pandemic are not useful and this has contributed to low adherence to public health restrictions and general mistrust for health authorities and systems.

The distortion of health information has also reduced the willingness of people to seek effective treatment of diseases (Murthy, 2021) which is often described as hospitalisation refusal. Lastly, the adoption of distorted health information has been linked to prescription abuse, and other harmful health behaviour such as self-medication. Gavira-Mendoza (2022) identified an increase in self-medication during the pandemic in four Colombian cities to either prevent COVID-9 infection with prophylaxis suggested on social media platforms, or to treat suspected infection with the COVID-19 virus.

1.8 Variables

The study had distorted health information (health misinformation and health disinformation) as the independent variable, and five public health outcomes as dependent variables: disease denial, vaccine hesitancy, prescription abuse and self-medication, hospitalisation refusal and public health authority and/or system mistrust. The relationship between the independent and dependent variables were moderated by the following social factors which served as intervening variables: age, income level, gender, level of education, language and location (urban or rural).

1.9 Methodology

The study was designed as a web-based cross-sectional and exploratory survey. Exploratory studies seek to provide insight into relatively under researched phenomena, and often resort to a qualitative approach to enable an in-depth description of phenomena (Cresswell, 2008). The study adopted both quantitative and qualitative methods to collect and analyse data. The study population included all adult Cameroonians with a consistent social media presence. The Raosoft sample size calculator was employed to select a statistically representative sample

(480) with an error margin of 2.0% at 95% confidence interval out of an eligible adult population of 18,000,000. To select elements of the study population into the sample, the researcher adopted stratified sampling techniques to select 480 participants for the study with an equal number of rural-dwelling and urban-dwelling respondents.

Data from respondents was obtained using questionnaires. Upon collection, the data was entered into a Microsoft Excel spreadsheet for analysis, while qualitative data from open ended questions in questionnaires were summarised. Quantitative data was analysed using descriptive statistics and the results were presented in tables or illustrated in charts. Qualitative data was analysed using thematic analysis to establish trends and patterns among variables in relation to the responses obtained from open ended questions. In the study, several ethical considerations were made. This include: ensuring voluntary participation of respondents, protecting the integrity, anonymity and confidentiality of respondents and their responses, and avoiding any form of plagiarism.

1.10 Data Analysis

1.10.1 Demographic Profile of Respondents

The age distribution of participants was determined using data obtained from questionnaires. The largest age group of participants was the under 25 year age group with 211 respondents (43.95%), followed by 152 respondents (31.66%) between 26 and 45 years and lastly 117 respondents (24.3%) who were above 45 years old. The study also had more female participants than males, with females constituting 56.66% of the sample (272) as opposed to males who constituted 43.33%. Using stratified sampling techniques, the researcher could arrive at an equal number of participants for the study, with 240 participants (50.0%) residing in urban areas and another 240 participants (50.0%) residing in rural areas. Also, the questionnaires elicited data about the linguistic origin of participants. The results indicated that 207 (43.12%) respondents identified as French-speaking (Francophone) while 273 (56.87%) identified as English-speaking (Anglophone).

The researcher also sought to determine the level of education of participants. From the responses the researcher could determine that 191 (39.79%) participants had obtained secondary education as their highest educational attainment, while 173 (36.04%) had acquired tertiary education, 113 (25.41%) had basic education and only 3 (0.62%) had no formal education. Three income brackets were employed to group participants into income level

categories: low income (below 100,000 FCFA), middle income (100,001 – 500,000 FCFA) and high income (500,001 FCFA and above). From the results, 209 participants (43.54%) were low income earners, while 163 (33.95%) were middle income earners and 108 (22.50%) were high income earners. In addition to the income level of participants, the researcher also determined the employment status of participants. The results indicate that 296 participants (61.66%) were employed while 143 (29.79%) were unemployed and the remaining 41 (8.54%) were retired.

1.10.2 Health Misinformation Adoption

To study the adoption of health misinformation, the researcher sought to determine participant's principal sources of health information, their rate of social media usage and their techniques for scrutinising health information. The results indicate that social media was the most prevalent information source among participants as indicated by 253 respondents (52.70%), followed by blogs with 113 respondents (23.54%), mass media with 71 respondents (14.79%) and lastly medical professionals with 41 respondents (8.54%). The results suggest a generally low preference for objective health information from medical professionals as opposed to social media and blogs which are more likely to convey emotionally charged and distorted information. With respect to the rate of social media usage of participants, the researcher could determine from the results that a majority of participants (289) had high rates of social media usage and constituted 60.20% of the sample, while 142 respondents indicated moderate social media usage (29.58%) and only 49 indicated low usage (10.20%).

The researcher then sought to determine the health information literacy skills of participants that moderated their adoption of health misinformation. Respondents were asked to suggest which methods they employed to scrutinise health information for accuracy and authenticity before relying on it to inform health decision making and the formation of beliefs. The researcher used five information evaluation criteria common to evaluating information in the digital environment. In response to whether participants checked health information received to determine the source of health information before relying on it for health decision making, 205 respondents (42.7%) indicated doing so while 275 (57.29%) did not. Also, 118 respondents (24.58%) indicated checking the authority of the creator or source of health information on the subject matter before believing it while 362 (75.41%) did not. Another method of evaluating health information was the use of web search engines such as Google and Bing to search for

similar publications on an information claim. Out of 480 participants, 279 (58.12%) indicated using this technique of evaluation to identify which information was false or not, while 201 (41.87%) did not. The use of reverse search technology for images and videos to determine whether health information has been used out of context, altered or distorted was also suggested as an evaluation criterion. Only 39 participants (8.12%) indicated using reverse search techniques to verify the authenticity and accuracy of health information while 341 (91.87%) did not. Lastly, the use of date of publication and context of publication as an evaluation criterion was suggested and 183 participants (38.12%) suggested having employed this technique to identify which information is worthy of adoption and which is false, while 297 (61.87%) did not. The results suggest that reverse search techniques were the least employed information evaluation technique, while the use of web based search engines was the most widely adopted search technique. Generally, participants were not capable of using information evaluation techniques effectively to identify health information and were therefore vulnerable to misinformation adoption. The mean score for all five information evaluation techniques was 34.33% which suggests a low proficiency in information evaluation among participants and suggest that participants are less likely to identify health misinformation.

1.10.3 Misinformation Adoption and Health Behaviour

Disease Denialism

The researcher sought to determine the implication of health misinformation on disease denialism. Specifically, the researcher sought to determine whether participants has been led to deny the existence of a disease (in this case COVID-19) on the basis of misinformation. The results indicate that 23 (4.79%) of respondents had concluded that COVID-19 did not exist on the basis of false information, while 118 (24.58%) had doubted the existence of COVID-19 at some point on the basis of false information.

Vaccine Hesitancy

The implication of health misinformation on vaccine hesitancy was also explored. Out of 480 respondents, 201 (41.87%) indicated being reluctant to take the COVID vaccine for fear of alleged adverse effects, while 213 (44.37%) indicated having advised others not to take the vaccine at some point for fears about its safety on the basis of information they had received. Lastly, 78 (16.25%) participants indicated being vaccinated but were once reluctant to do so on the basis of false information they had been made to believe. The researcher then sought to

determine the vaccine uptake rate within the sample. Out of 480 respondents, only 115 (23.95%) indicated being vaccinated while 365 (76.04%) were not. Also, for unvaccinated members of the sample, 43 (8.95%) indicated contemplating vaccination while 322 (67.08%) did not.

Public Health Institutions or System Mistrust

The questionnaires also asked questions to determine how misinformation affected trust in public health institutions, authorities and systems. Out of 480 respondents, 291 (60.62%) indicated having little confidence in the agencies and institutions in charge of health and did not trust the intentions of health authorities with respect to COVID-19 as opposed to 189 (39.37%) who did not. Similarly, 80 (16.66%) respondents were afraid to seek medical attention at public health facilities due to information received about the virus.

Hospitalisation Refusal

Respondents were also asked questions to determine whether health misinformation adoption had resulted in hospitalisation refusal. From the results obtained, 16 (3.33%) participants indicated having refused hospitalisation due to rumours about the COVID-19 virus, while 78 (16.25%) indicated having advised others to refuse hospitalisation.

Prescription Abuse and Self-Medication

The researcher also sought to determine how health misinformation had informed poor medication habits. From the results, 114 (23.75%) participants indicated having taken wrong prescription from social media or non-medical sources for suspected COVID-19 infection, while 203 (42.29%) had advised others to self-medicate with prescription from social media that was later proven to be incorrect. Some of the prescription participants had either self-administered or advised others to take on the basis of false information include chloroquine, amodiaquine, atemesinin, ginger, garlic, bitter kola, marijuana and alcohol.

1.10.4 Health Misinformation Adoption and Health Behaviour across Social Groups

The results below suggest a higher level of adoption of health misinformation among females than males Adverse health outcomes were significantly higher for females such as with respect to COVID-19 denial (69.56%) as opposed to 3.39% for males and vaccine hesitancy (56.71%) as opposed to 42.23% for males. While they were significantly higher in only one health

outcome for males which was public health system mistrust (83.98%) as opposed to 43.38% for females. The difference in health outcomes for medication practices and hospitalisation refusal were minimal. These results had a p-value of 0.012 which was deemed significant and demonstrated an association between gender and health outcomes upon the adoption of health misinformation.

There was also wide contrast in the rate of adoption of health misinformation between rural and urban populations. Rural dwellers had a higher rate of vaccine e hesitancy (51.66%) as compared to 30.41% for urban dwellers. With respect to public health system mistrust rural dwellers had a 78.75% rate as opposed to 42.5% for rural dwellers. Lastly, the rate of hospitalisation refusal in rural dwellers was 4.58% as opposed to 2.08% for urban dwellers. Urban dwellers were significantly higher with respect to their rate of self-medication and prescription abuse due to misinformation (30.0%) as opposed to 17.5% for rural dwellers. These results returned a p-value of 0.025 which indicated the significant association between place of dwelling and health behaviour due to health misinformation adoption.

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Characteristic	Overall Sample	Disease Denialism	Vaccine Hesitancy	Hospitalisation Refusal	Public Health Authority Mistrust	Self-Medication & Prescription Abuse	p-value
GENDER							
Male	n = 206 43.3%	n = 7 3.39%	n = 87 42.23%	n = 7 3.39%	n = 173 83.98%	n = 73 35.43%	0.012
Female	n = 272 56.6%	n=16 69.56%	n = 114 56.71%	n = 9 3.30%	n = 118 43.38%	n = 41 35.96%	
HABITAT							
Urban Dweller	n = 240 50.0%	n = 12 5.0%	n = 73 30.41%	n = 5 2.08%	n = 102 42.5%	n = 72 30.0%	0.025
Rural Dweller	n = 240 50.0%	n=11 4.58%	n = 124 51.66%	n = 11 4.58%	n = 189 78.75%	n = 42 17.5%	
EDUCATION							
No education	n = 3 0.62%	n = 1 33.3%	n = 3 100.0%	n = 2 66.6%	n = 3 100.0%	n = 2 6.6.6%	0.002
Basic	n = 113 25.41%	n=12 10.61%	n = 86 76.10%	n = 9 7.96%	n = 98 86.72%	n = 41 36.28%	
Secondary	n = 191 39.79%	n=6 3.14%	n= 76 39.79%	n=4 2.09%	n= 135 70.68%	n=57 29.84%	
Tertiary	n = 173 36.04%	n= 4 2.31 %	n=36 20.80%	n=1 0.57%	n= 55 31.79%	n=13 7.51%	

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Characteristic	Overall Sample	Disease Denialism	Vaccine Hesitancy	Hospitalisation Refusal	Public Health Authority Mistrust	Self-Medication & Prescription Abuse	p-value
INCOME LEVEL							
Low	N = 209 43.54%	n = 15 7.17%	n = 77 36.84%	n = 11 5.26%	n = 159 76.07%	n = 82 39.23%	0.025
Middle	N = 163 33.95%	n= 6 3.68%	n = 88 53.98%	n = 4 2.45%	n = 81 49.69%	n = 23 14.11%	
High	N = 108 22.5%	n=2 1.85%	n=36 33.33%	n=1 0.92%	n=51 47.22%	n=9 8.33%	
LANGUAGE							
French	N = 207 43.12%	n = 9 4.34%	n = 92 44.44%	n = 8 3.86%	n = 93 44.92%	n = 71 34.29%	0.010
English	N = 273 56.87%	n=14 5.12%	n = 109 39.99%	n = 8 2.93%	n = 198 72.52%	n = 43 15.75%	
EMPLOYMENT							
Unemployed	N = 296 61.66%	n = 17 5.74%	n = 138 46.62%	n = 11 3.71%	n = 207 69.93%	n = 26 8.78%	0.051
Retired	N = 143 29.79%	n= 4 2.79%	n = 49 34.26%	n = 3 2.09%	n = 68 47.55%	n = 79 55.24%	
Employed	N = 41 8.54%	n= 2 4.87%	n= 14 34.14%	n=2 4.87%	n=16 39.02%	n=9 21.95%	

With respect to participant's level of education, the results indicate that the adoption of health misinformation as well as the prevalence of adverse health outcomes decreased with an increase in the level of education. The results indicated a COVID-19 denial rate of 33.3% for people with no formal education, 10.61% for persons with basic education, 3.14% for persons with secondary education and 2.31% for persons who had tertiary education. Similarly, for vaccine hesitancy, the results indicated a hesitancy rate of 100.0% for people with no formal education, 76.1% for persons with basic education, 39.79% for persons with secondary education and 20.80% for persons who had tertiary education. For hospitalisation refusal, the results indicated a refusal rate of 66.66% for people with no formal education, 7.96% for persons with basic education, 2.09% for persons with secondary education and 0.57% for persons who had tertiary education. For public health authority or system mistrust, the results indicated a rate of 100.0% for people with no formal education, 86.72% for persons with basic education, 70.68% for persons with secondary education and 31.79% for persons who had tertiary education. Finally, for poor medication habits such as self-prescription and prescription abuse, the results indicated a rate of 6.66% for people with no formal education, 36.28% for persons with basic education, 29.84% for persons with secondary education and 7.51% for persons who had tertiary education. With the exception of self-prescription, all other adverse outcomes demonstrated that an increase in education will reduce the prevalence of adverse health behaviour.

Income level was also shown to be influenced by the adoption of health misinformation with the exception of COVID-19 denial and vaccine hesitancy. The researcher used the following income levels: less than 100,000 francs a month (low), 100,001 to 5,00,000 moderate and 500,001 and above as high income. For hospitalisation refusal, the rate of refusal was 5.26% for people with of low income, 2.45% for persons of moderate income and 0.92% for persons of high income. Similarly, for the rate of public health authority mistrust due to misinformation adoption was 76.07% for people with of low income, 49.69% for persons with moderate income and 47.22% for high income persons. Similarly, for the rate of prescription abuse and self-medication due to health misinformation adoption was determine to be 39.23% among low income earners, 14.11% among moderate income earners and 8.33% among high income earners. A similar trend was determined for the rate of COVID-19 denial across income brackets. The rate of disease denialism due to misinformation adoption was 7.17% for people with of low income, 3.68% for moderate income and 1.85% for high income persons. The only exception was with vaccine hesitancy where hesitancy levels among moderate income earners

(53.98%) was higher than among low income earners (36.84%) with 33.33% of high income earners being vaccine hesitant due to the adoption of misleading health information.

Linguistic origin was also shown to determine the adoption of health misinformation and the formation of adverse health behaviour. Vaccine hesitancy, hospitalisation refusal and poor medication habits were higher in French speaking participants than among English-speaking participants. With respect to vaccine hesitancy, 44.44% of French speaking participants were hesitant as opposed to 39.99% for Anglophones, while hospital refusal rate was 3.86% among Francophones as compared to 2.93% in Anglophones. Lastly, 34.29% of Francophones has developed poor medication habits due to health misinformation absorption as compared to 15.75% for Anglophones. The difference in COVID-19 denial between Francophones (4.34%) and Anglophones (5.12%) was minimal. Differing from the results above, Anglophones showed a higher level of mistrust in public health authority (72.52%) as opposed to 44.72% for Francophones.

The occupational status of participants was shown to have no significant association with public health behaviour due to health misinformation adoption. Disease denialism was shown to be higher in unemployed persons (5.74%) followed by employed persons (4.87%) and lastly retired persons (2.79%). However with respect to vaccine hesitancy, the rate was highest among unemployed persons (46.2%), followed by 34.2% for retired persons and 34.14% for employed persons. Differing from the trend above, the rates for hospitalisation refusal were 3.71% for unemployed, 2.09% for retired and 4.87% for employed. With respect to public health authority mistrust, 69.93% of participants indicated mistrust due to misinformation, as opposed to 47.55% among retired persons and 39.02% among employed persons. Differing from the trend above, the rate of self-prescription and medication abuse was highest in retired persons (55.24%), followed by 21.95% in employed persons and 8.78% among the unemployed.

1.11 Discussion

Disease denialism was determined to be 4.79%, with 24.58% doubting the existence of the disease (COVID-19). Specifically, it was highest among females with 69.5% of disease denialism reported among women. By establishing disease denialism as an outcome of the adoption of health misinformation, the study affirms the views of Boyle and Purdon (2019) who suggested that disease denialism was an outcome for the distortion of health information.

Similarly, Chigwedere et al. (2018) pointed to misinformation as a reason for high levels of disease denialism in South Africa in the 1990s.

Vaccine uptake was determined to be 23.95%, with 41.38% of the sample expressing reluctance to take vaccines and the total vaccine hesitancy determined to be 67.08%. The low vaccine uptake reflects previously published statistics on Cameroon by the World Health Organisation (WHO, 2022) who suggested that less than 2 million Cameroonians were vaccinated from a population of over 27 million. The study establishes health misinformation as a reason for low vaccine uptake and hesitancy. Vaccine hesitancy was higher among females (56.71%), rural dwellers (51.66%) and people without any formal education (100%). This affirms the position of Catalan-Matamoros (2020) who pointed to false health information as a reason for low vaccine uptake. However, it differs from Dingha, Sinda & Titanji who in earlier study on Cameroon estimated vaccine hesitancy at 84.6%., much higher than 67.08% in this study.

Mistrust in health authorities due to misinformation was determined at 60.62% overall and was even higher among unemployed persons (69.93%), rural dwellers (78.75%), people without any formal education (100.0%), low income earners (76.06%) and English-speaking participants (72.52%). The high prevalence of public health mistrust within the sample of study affirms the conclusions of Brun and Roitman (2020) who opined that the widespread distortion of health information has blurred the lines between truth and reality and undermined trust for health authorities and systems (Brun & Roitman, 2020). Furthermore, Moro et al. (2022) held that health information distortion radicalises domestic audiences and helps erodes citizens trust in institutions, as well as limits the ability of health institutions to address health challenges

Hospitalisation refusal was determined to be 3.33% overall and was even higher among low income earners (5.26%) and persons with no formal education (66.66%). The incidence of hospitalisation refusal as an outcome of health misinformation adoption affirms the view that the willingness of people to seek effective treatment of diseased could be informed by the distortion of health information (Murthy, 2021) The findings are similar to Kollamparambil et al. (2021) who found that health misinformation had informed poor health attitudes such as hospitalisation refusal.

The findings also suggest the incidence of poor medication habits due to misinformation adoption to be 23.75%. It was even higher among retired persons (55.24%) and people with

only basic education (36.28%). Common self-administered drugs included chloroquine, amodiaquine, atemesinin, ginger, garlic, bitter kola, marijuana and alcohol. The findings affirm the view of Kollamparambil et al. (2021) that health misinformation could inform negative health behaviour such as self-medication which undermine the attainment of public health goals.

1.12 Conclusion

The study established the nexus between health misinformation and health behaviour, and demonstrated how social inequalities affected the adoption of health misinformation that resulted in adverse health behaviours. With the exception of occupational status, all social factors were considered to influence the adoption of health information including gender, level of income, language, level of education and habitat. Females were determined to have a higher level of health misinformation adoption than males, likewise health misinformation adoption was higher in rural folks than in urban folks. The adoption of health misinformation also declined with an increase in the level of income and the level of education. The adverse health outcomes identified were vaccine hesitancy, disease denialism, hospitalisation refusal, health authority mistrust, and self-medication and prescription abuse.

1.13 Recommendations

On the basis of the findings it is recommended that public health authorities integrate health information literacy into their core objectives. The acknowledgement of the centrality health information literacy to the attainment of public health goals will inform the development of strategies to leverage on information to improve public confidence in health systems and enhance communication between health authorities and the public. In Cameroon where English and French are the most widely spoken national languages, it is important for health authorities to limit incidence of misinformation that emanates from inefficiencies in translation or the unavailability of translations by ensuring that all health information communicated to the public is translated to English and French, with the aid of illustrations to help convey information to semi-literate members of the public. In addition, the wide adoption of social media by health authorities to communicate health information may also reduce the adoption of health information. Instead of over reliance on mass media, health authorities could exploit the unique advantage of social media to reach wider audiences in a shorter time to disseminate health information. Effectively packaging health information and relying on data analytics to

communicate different packaged messages to different audiences in the means and manner that makes them easily exploited will also enhance the visibility of objective health information amid an abundance of distorted information. Also, the deployment of a public health fact checker to identify potential misinformation for scrutiny could reduce health misinformation adoption. Public health fact checkers could exploit communication channels such as social media, mass media and print media to debunk misleading health information and suggest objective alternatives to the public. Lastly, the study informs the need for more studies on other aspects of the information- health nexus. The study raises the issue of public health system/ authority mistrust as an outcome of health misinformation. It is therefore imperative for further studies to be conducted to deconstruct the development of mistrust for public health systems and authorities, and explore avenues for tackling the challenge. In addition, similar studies are also recommended to explore the possible implication of misinformation on health outcomes such as hospitalisation, morbidity and mortality.

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QUESTIONNAIRE

1. Age
Below 25 years (....) 26 - 45 years (....) Above 46 years (....)
2. Gender:
Male (....) Female (....)
3. Place of Abode
Urban Dweller (....) Rural Dweller (....)
4. Level of Education
None formal education (....) Basic (....) Secondary (....) Tertiary (....)
5. Income Level
Low: <100,000 frs (..) Middle: 100,000 – 500,000 frs (..) High: > 500,000 frs (..)
6. Employment Status
Employed (....) Unemployed (....) Retired (....)
7. Primary Language
Francophone/ French (....) Anglophone/ English (....)
8. Principal Sources of Health Information
Blogs (....) Social Media (....) Mass Media (....) Medical Professionals (....)
9. Describe your rate of Social Media Usage
High (....) Medium (....) Low (....)
10. What methods do you employ to evaluate information for accuracy and authenticity?
(Please tick which ever statement that applies)

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- I check the source of information and the source's auspices
- I check the authority of the source of information on the subject matter
- I use web based search engines such as Google to see if similar publications with the same information exist
- I verify the date and context of the information
- I verify images and videos using reverse search techniques

11-21. Provide responses to the following statements in the table using the matrix below:

1 = Agree 2 = Neutral 3 = Disagree

#	Statement	1	2	3
11	Information I have received or read has led me to conclude that coronavirus does not exist			
12	Information I have received or read has made me doubt the existence of COVID-9 in the past			
13	I believe COVID-19 exists but did not believe so in the past on the basis of information I received and read.			
14	I am reluctant to take the vaccine for fear of its adverse effects as opined on social media and other sources			
15	I have/will advise people not to take the vaccine because information I have received or read suggest it is unsafe			
16	I have come across information that has stirred my fear about infertility or infection with coronavirus if I get vaccinated			
17	I am currently vaccinated but was once reluctant to take the vaccine due to false information I was led to believe			
18	Information available to me has made me mistrust the government and its agencies in charge of health and hospital authorities			
19	Information available to me has made me mistrust the intentions of health authorities with respect to COVID-19			
20	I am afraid to seek medical attention at a public health facility due to information available to me about the treatment of covid-19 patients.			
21	I will not be vaccinated even if compelled to do so on the basis of information available to me about the pandemic			

22. Are you vaccinated? Yes (...) No (...)

23. If NO, do you have plans to be vaccinated?

25 – 29. Provide responses to the following statements in the table using the matrix below:

1 = Agree 2 = Neutral 3 = Disagree

#	Statement	1	2	3
25	I have refused hospitalisation for COVID-19 because of information or rumours about hospital treatment of COVID patients			
26	I have refused hospitalisation for family or friend			
27	I have advised persons suspected to be infected with COVID-29 to avoid hospitalisation because of information about the virus			
28	I have taken prescription to treat a suspected case of COVID-19 based on unverified information from nonmedical sources			
29	I have advised suspected cases of COVID-19 to take prescriptions from unverified non-medical sources			
30	I have administered wrong prescription on the basis of false COVID-19 related information			

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31. List any medications you have either self-administered or advised others to take on the basis of false information.