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Assessing Health Policymakers' Knowledge and Capacity for Optimizing Computer-Aided Approaches in Evidence-Informed Policymaking

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ABSTRACT

The role of policymakers' capacity in determining the right policy direction cannot be overemphasized. In recent times, the use of computer-aided tools innovates and smartly enhances policymakers' operational capacity. This study assesses key policymakers' knowledge/perception, capacity for optimizing computer-aided approaches in facilitating evidence-informed policymaking in Ebonyi State Nigeria. This cross-sectional study used structured questionnaire of 5-point likert scale among key health policymakers/stakeholders in the health sector in Ebonyi State. The study had fifty (50) participants who were key stakeholders in the health sector sampled at the technical meetings of the Advocacy Working Group (AWG) of Health Policy Plus (HP+) in Ebonyi State. Data was collected using the questionnaire and analyzed in a table of descriptive statistics using IBM SPSS version 20 software. Findings from the research recorded fair knowledge/perception of basic computing techniques/approaches with average mean rating MNR (3.69), and for policymaking ideals MNR (3.74) less evidence use dynamics MNR (2.87). Capacity for optimizing computer-aided approaches returned a very weak average MNR (2.99), desire/willingness to adopt emerging computing technique in evidence-informed policymaking MNR (4.40). Policymaking perspectives average MNR (3.66). The study findings indicated fair knowledge index, very weak capacity for optimizing computer-aided approaches, but with a high desire both to adopt and uptake it in advancing EIP in the health sector. The study recommends comprehensively articulated strategic capacity enhancement training intervention for key policymakers on this subject.

Keywords: Computer-Aided, Synthesize, Evidence-Informed, Pretest, Optimize, Policy, Health

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1. INTRODUCTION

In a rapidly degenerating society marked by poly-crisis of misinformation and fake news thriving like wildfire, there is an overriding need for enhanced capacity in exploring pertinent computing dynamics is decision-making (EPA, 2024).

An unhindered access to reliable information is a critical step in support of an evidence-informed decision-making process and development-based practice. The global health systems community have been facilitated through progressively sustained and rapid utilization of technology innovation in computing. The growing trends in computing and information technologies has continued to transform, reform and inform new methods refining the results of our daily undertakings. In developed economies, computers offer physicians and healthcare providers easier method in which they can treat and care for patients.

There abound some notable impacts of computing in terms of changes in information flow process, allowing greater access and improved dissemination of information, facilitating public discourse/dialogue around major public health threats (Chetley *et al*. 2006, Laudon and Laudon, 2010). Experts tap into opportunities to explore unlimited resources on virtually all issues of public health demands, with measures to substitute sequential steps with simultaneous ones reducing latency in decision-making process. The dynamism in technology especially in the field of computing, resonates robust support base reckoned with witty inventions and interventions across disciplines including provision of seamless interactive interfaces among stakeholders.

Emerging trend in network technologies allows caregivers to connect sensors and input devices in patient home to a “home-health-care provider" made home care for even gravely ill patients a possibility (Shachaf, 2008; Billie, 2014). The versatility of numerous computing technique is making tremendous inroad in various aspects of healthcare systems, ranging from hospitals to pathology labs to dental clinics (Sommerville, 2011; Scott-Clark, 2023). Some of the existing computing platforms implementation milestone potentially enables metric-engineered processes for undertaking real-time service delivery. For instance, certain platforms are being optimized and structured as information engineering support for facilitating evidence-informed health policy assessment/evaluation.

With computing engineered efforts, we can advance healthcare systems by forming beneficial backbone for disease preventions/controls, faster/better diagnosis/treatment protocols. It will further create measures for strengthening evidence-based policy process through systematic controlled access and utilization of huge health information resource. This calls for government deliberate investment in critical infrastructures that facilitates innovations in technology and other initiatives geared towards stirring research evidence ecosystem for policymaking.

Leveraging computer-aided tools supports policymakers in optimizing evidence-informed policy development and implementation milestones. Certain technical configurations aggregates and assemble best available evidence both from research and other sources, but require policymakers’ commensurate capacity index to be able to audit and synthesis the information. This is critical in facilitating precise outcomes towards establishing standards and influential drives for evidence-informed policymaking and decision-making process. Bridging the gap between the dynamic computing technology innovations and health experts requires a diverse boost in capacity for optimization of computing tools to access and synthesize information into useful evidence (Uneke et al., 2015).

Skill and capacity related issues are critical for structured and unstructured searching/extracting, synthesizing and analyzing information to support processes of formulating policymaking logics and conclusions ((Fischer et al., 2011; Nyambane & Nzuki, 2019). This underscores the critical need for strong advocacy in prioritizing the integration of ICT infrastructural investments that stirs a boast in capacity enhancement for policymakers at all levels especially in the health sector. Building and wielding a robust ICT capacity does not only influence policy reformation, but also pivotal to improving policy outcomes and health systems performance efficiency (Nyambane & Nzuki, 2019, Adewoye & Salau, 2021). A polished capacity will be very instrumental in assisting policymakers have a good grasp of the policy issues.

In Nigeria, most policymakers need routinely enhanced skillful capacity in engaging scientific technique in the extraction and utilization of research evidence relevant for policymaking (Uneke *et al.,* 2015). Health challenges in developing countries are more likely to be solved by researchers in those countries, proficiently equipped with the right questions to ask and methodologies to adopt for feasible solutions. For this, they need access to the global pool of scientific knowledge (WHO, 2004; NICE, 2009). Seeking expert's involvement is quite significant given their knowledge index about the policy context as well as the institutional peculiarities and barrier characteristics. Consequently, they can provide objective and context-sensitive judgments regarding the relative importance and proficiency of different factors that comprises domains of any focal system.

Therefore, the purpose of this research was to understudy policymakers' knowledge and capacity index, as well as determining their desired perception for uptake of computer-aided innovative approaches in facilitating evidence-informed policymaking (EIP). An interesting motivation for this study is the need to mobilize strategies to bridge any perceived gap in knowledge and capacity among health stakeholders' – thereby strengthen the process and their operations for improved health service delivery.

2. METHODS

2.1 Study design

This was a descriptive cross-sectional study design. The researcher adopted the methods developed at McMaster University Canada to prepare structured questionnaire of 5-point Likert scale used as instrument for data collection (Johnson and Lavis, 2009). The questionnaire was organized in four (4) segments comprising of demographic parameters, knowledge/capacity to apply computing tools, roles/involvement in policymaking process and grasp on policy assessment dynamics.

2.2 Study area and population: the study was conducted at a subnational level in Abakaliki the Ebonyi State capital city, Nigeria. The State capital play host to all the MDAs and other health institutions from whence the study drew the respondents. The research participants consisted of individuals whose geographical area of operation is south-eastern Nigeria, with emphasis on Ebonyi State. The target participants were the career health policy makers, this category of policymakers included: health professionals in charge of the health systems; regional, state and local government directors of the health ministry; directors of primary health care at the local government level;

health professionals working with specific programmes in the health ministry; staff and consultants involved in public health issues within the health ministry; programme/project managers under the health ministry; chief executive officers of civil society groups, including non-governmental organizations in Ebonyi State.

They are the principal actors that play the most vital role in "evidence-to-policy" making process such as the generation, collection and assembling of policy relevant information, and processing of data and reports on health-related issues from the different sectors of the health system. The study sampled a total of fifty (50) respondents in three (3) different stakeholders' engagement meeting of the Advocacy Working Group (AWG) of Health Policy Plus (HP+) in Ebonyi State. Their consents were verbally sort, they accepted and completed the questionnaire tool.

2.3 Data analysis

Data collected were systematically extracted from the questionnaire and subjected to statistical analysis using SPSS software, which presented the results in tables of descriptive statistics. The demographic characteristics were analyzed in percentage ratings. The core study questions were analyzed through the use of the method developed at McMaster University Canada by Johnson and Levis (2009). The analysis was based on mean rating (MNR), using figures represented in likert scaling 1–5 points, where 1 point = grossly inadequate, 2 points = inadequate, 3 points = fairly adequate, 4 points = adequate and 5 points = very adequate. This equally applies to cases where agreement questions were used, that is from strongly disagree up to strongly agree, and where we used options "very low", "low", "fairly", "high" and "very high".

The mean was calculated by summing up the product of the rating of the responses (points) and the number of times the particular response appeared (frequency) for a particular question and then dividing by the total number of responses to that question. In this analysis, resultant values (MNR) ranging from 1.00-3.49 are considered low or weak, whereas those ranging from 3.50-5.00 points are considered high or strong (Johnson and Levis, 2009). The results of the assessed variables are outlined in tabular form in the subsequent section.

3. Presentation of Results

A total of 50 key stakeholders/policymakers of different sectors of the health system participated in the study. The results are presented in their respective categories in tables of descriptive statistics expressed in percentages and mean rating (MNR) values. Detailed description for each category is represented in tables 1, 2, 3, 4, and 5.

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Table 1: Demographic Characteristics Of Health Policymakers/Stakeholders

Name of Variable	Total Number	Percentage
Gender:		
Male	25	53.2%
Female	22	46.8%
	Total=47	
Organization:		
State Ministry of Health	14	28.6%
DA/PHCDA	14	28.6%
Civil Society/NGO	11	22.4%
Others	10	20.4%
	Total=49	
Rank:		
Director/Deputy Director	26	53.1%
Progr.Manager/Supervisor	16	32.7%
Officer	7	14.2%
	Total=49	
Policymaking position held:		
Commissioner	1	2.7%
Perm. Secretary	4	10.5%
Executive Secretary	4	10.5%
HOD, Officers	29	76.3%
	Total=38	
Years of policymaking experience:		
<5yrs	13	26.5%
5-10yrs	16	32.7%
>10yrs	14	28.6%
	Total=43	
Influence on policymaking process:		
Direct	27	56.3%
Indirect	21	43.7%
	Total=48	
Highest Qualification:		
Diploma	3	6.4%
Bachelor	18	38.3%
MBBS	3	6.4%
Masters	20	42.5%
Doctorate	3	6.4%
	Total=47	

Table 1, presents the demographic attributes and profile of the study participants having their gender distribution put at about 54% and 47% for male and female respectively. A combination of the stakeholders from the state ministry of health (SMoH) and their associated MDAs, accounted

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for more than two-third of the respondents (57%), whereas those from civil society/NGOs accounted for (22.4%) and others including researchers and development partners were (20.4%). Majority of the respondents (53%) were in the rank of directors/deputy director, and some others have held top policymaking positions such as permanent secretaries and executive secretaries of the state primary healthcare development agency (SPHCDA). More than two-third of the participants had spent over 5 years (32.7%) and a little below two-third (28.6%) had spent above 10 years in their current designation, with about 56% direct influence on policymaking process in the state. These participants stream had some doctorate degree holders, over 42% holding masters' degree and over 38% had bachelors' degree.

Table 2: Stakeholders' Knowledge Of Computing In Policymaking

Questions	*GI*	*IA*	*FA*	*AD*	*VA*	*Total*	*Mean*
What is your level of general computer literacy knowledge	0	3	16	20	10	49	3.76
Describe your perception of the adequacy of operation(s) you can perform using a computer system	0	22	8	13	5	48	3.02
Describe your knowledge of the internet as a source for searching information relevant for policymaking	0	6	11	18	14	49	3.81
knowledge of electronic databases where relevant evidence for health policymaking can be obtained e.g. pubmed, google scholar, IEEE, etc	0	11	17	14	6	48	3.31
Describe your knowledge of computing approaches being veritable in EIP process	4	5	14	15	11	49	3.50
Describe your level of understanding of the efficacy of engaging computing tools in EIP process	2	4	14	16	13	49	3.69

***Key**: GI=Grossly Inadequate, IA=Inadequate, FA=Fairly Adequate, AD=Adequate, VA=Very Adequate. Each question is coded with the first letter of the keywords.*

Table 2 presented the results of the knowledge index of participants on the use of relevant computing aids in evidence-informed policymaking (EIP). The result shows a mean rating (MNR) of 3.76 and 3.81, describing the knowledge index of policymakers in terms of computer literacy and the internet as veritable source of information collection. It recorded mean rating of 3.02 and 3.31 respectively for the perception of operations adequacy and knowledge of electronic databases where relevant research evidence for health policymaking can be obtained. That of the knowledge of computing approaches being veritable in EIP process has mean rating of 3.50, while the understanding of the efficacy of engaging computing tools in EIP process is 3.69 mean rating.

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Table 3: Stakeholders Knowledge Of The Ideals Of Evidence-Informed Policymaking

Questions	*GI*	*IA*	*FA*	*AD*	*VA*	*Total*	*Mean*
Understanding of the meaning of policy	0	1	11	24	8	49	4.0
Understanding of policy context considerations	1	1	16	26	5	49	3.67
Understanding of ideals of policymaking process	1	3	15	24	5	47	3.68
knowledge of the need for involvement of stakeholders' and various actors in policymaking	0	1	12	22	13	48	3.95
Rate your knowledge on the types of evidence that are useful for policy making?	5	18	12	9	4	48	2.77
Understanding of meaning and importance of priority setting in policymaking	3	1	15	22	8	49	3.63
Knowledge of efficacy of policy dialogue in policymaking	0	4	18	21	9	49	3.59
Knowledge of the sources of evidence relevant for policymaking?	5	12	17	8	5	47	2.91
Describe your understanding of the importance of evidence use in policy context	1	4	14	20	9	48	3.66
Knowledge on the role of research/researchers in policymaking?	0	3	11	24	10	49	3.77
Describe the level you and your organization consider the use of research evidence in policymaking	3	17	12	10	5	47	2.93

Key: *GI=Grossly Inadequate, IA=Inadequate, FA=Fairly Adequate, AD=Adequate, VA=Very Adequate. Each question is coded with the first letter of the keywords.*

Table 3 presents results of stakeholders' knowledge of the ideals of evidence-informed policymaking, where the understanding of the meaning of policy and considerations for the different policy processes such as context issues, priority setting, policy dialogue etc recorded mean rating ranging from 3.59–4.0 indicating good standing. There is however shortfall in terms of knowledge questions regarding what constitutes reliable evidence and authentic/verifiable sources of evidence record mean rating ranging from 2.77–2.93.

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Table 4: Stakeholders Capacity For Computing Approaches In Evidence-Informed Policymaking

Questions	GI	IA	FA	AD	VA	Total	Mean
Describe your ability & frequency of using the internet to search for information relevant for policymaking	4	9	18	10	8	49	2.57
Capacity to use electronic databases such as pubmed, google scholar, IEEE, etc in searching for information	7	16	13	7	5	48	2.71
Capacity to identify/obtain research evidence relevant for policymaking using computing tools	1	4	23	16	5	49	3.41
Capacity to extract & synthesize information for policymaking with the aid of computer	1	12	19	11	5	48	3.11
Ability to access and use existing research evidence from online journals, internet and other sources	2	12	15	10	10	49	3.28
How would you rate your ability to transform evidence into policy useable form?	4	15	17	6	5	47	2.85
Capacity for optimizing relevant computing approaches & tools in generally advancing policymaking process	3	14	13	15	4	49	3.06
Willingness to adopt and advance computer-aided approaches/tool in promoting EIP process.	0	0	5	19	25	49	4.40

Key: GI=Grossly Inadequate, IA=Inadequate, FA=Fairly Adequate, AD=Adequate, VA=Very Adequate. Each question is coded with the first letter of the keywords.

Table 4, presents the results of stakeholders' capacity for uptake and optimization of computing approaches in evidence-informed policymaking. The result provided the mean rating ranging 2.51–3.41 for a variety of parameter bothering on capacity for robust internet navigation in search critical information, searching electronic databases, ability to identify/obtain relevant research evidence, capacity to audit and synthesize information including those from online journals and how to transform them into useful formats.

On the other hand, ability to optimize relevant computing approaches in generally advancing policymaking process recorded mean rating of 3.06, whereas the willingness to adopt and advance computer-aided approaches/tools in promoting EIP process appreciably recorded 4.40 mean rating.

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Table 5: Stakeholders' General Approach To Health Policymaking & Implementation

Questions	GI	IA	FA	AD	VA	Total	Mean
Describe your level of involvement in the task of policy making process	0	3	18	22	6	49	3.63
Describe your perceived agreement to the importance of policy pre-test before implementation	2	-	-	14	33	49	4.55
Describe the adequacy of organizational pre-test mechanism	4	15	16	11	3	49	2.95
Level at which organization engage with manual process to assess prospects of policy documents	2	4	2	12	29	49	4.26
Describe the level of considerations accorded to policy methodology	3	6	13	19	8	49	3.50
Describe your level of the use of policy monitoring, evaluation & supervision in policymaking process	0	10	14	18	7	49	3.81
What is the extent of your consideration for advocacy and policy dialogue as instrument for EIP	1	5	15	23	5	49	3.53
Describe your level of consideration for policy analysis technique in policymaking	1	8	18	17	4	48	3.31
Engaging policy implementation strategies	0	8	12	20	7	47	3.60
Describe the extent of deployment of organization's performance metrics	1	11	7	23	6	48	3.51

Key: GI=Grossly Inadequate, IA=Inadequate, FA=Fairly Adequate, AD=Adequate, VA=Very Adequate. Each question is coded with the first letter of the keywords.

Table 5, was used to present the results addressing stakeholders' roles and undertaking in respect of general dealings associated with health policymaking & implementation.

The result indicated mean rating values ranging from 2.95–3.81 touching general policymaking perspectives that are typical of our conventional process. In aligning with the purpose of this study, it could be observed that stakeholders' approach in the task of policymaking recorded a mean rating of 3.63 and their use of policy monitoring, evaluation & supervision recorded 3.81, which are both reasonably crossing the high benchmark.

Agreement on the importance of policy pre-test before implementation and stakeholders' organization routine practice of engaging with manual assessment process to determine prospects of policy documents recorded 4.55 and 4.26 mean rating respectively. This points to the fact that though they are favourably disposed to policy pretest/assessment prior to implementation decisions, they have only been stalked with manual approach highlighting the import of computer-aided tool in a twenty-first century health system.

4. DISCUSSION OF RESULTS

The findings in this study has provided some useful insight to guide the advocacy for uptake of computing technique that will strengthen evidence-informed policymaking process in low-and-middle income countries such as Nigeria. From the outcome of this study, there is strong indication of participants possessing a relatively fair knowledge the ideals of computing technology literacy and the internet as veritable source for gathering policy relevant information. This aligns with a study finding that viewed policymakers' computer literacy as task of responsibility where one seek to be enriched with the know-hows supports in the line of duty (Uneke et al., 2011). It tends to affirm the fact of the increasing wider reach of computing dynamics permeating virtually every sector through self-development endeavor.

Studies suggest a correlation of knowledge proficiency and improved awareness of higher work efficiency arising from computer assisted engagements (Khan et al, 2012; Nyambane & Nzuki, 2019). In a similar turn of outcome, there was very stronger indication as to the stakeholders' knowledge of the ideals of health policymaking but limited in grasping the evidence sources and use process. Though it generally suggest high know-how proficiency in primary area of operation, perceived deficiency in evidence knowledge is a serious red flag. Findings in this study suggest the stakeholders' inadequacy on computer operational perception and knowledge of electronic databases for obtaining policy relevant research evidence, which needs to be improved upon.

The study findings suggests a very weak stakeholders' capacity for uptake of computing approaches and optimizing them in promoting evidence-informed policymaking. Assessed parameters were on the capacity to identify relevant research evidence, audit/synthesize information, and navigate the internet, electronic databases and online journals in search of policy relevant information. With constraints of this scale on almost all aspects poses a serious danger requiring urgent intervention. In a study, emphasis was made in tailoring intervention to address capacity shortfalls as a conceptual approach to personal development that enhances measures for tech-innovation (Neely 2015; Paiva et al 2022).

At a time computing dynamics is diversely ruling the world, policymakers need brace to responsibilities of dressing up to health systems' life wire by improving their digital competence. Taking this conscious step will bring policymakers and stakeholders at par with their counterparts in developed economies. (Chigozie *et al.*, 2015; Timotheou *et al.*, 2023). A major contributing factor to the reported capacity deficiency in exploring computer-aided approaches for advancing evidence-informed policymaking could be as a result of less interest and lack of trust in its suitability.

The outlook of findings of roles and stakeholders observance of conventional policymaking perspectives is fairly high. This finding suggests that policymakers' give due considerations to methods and practice of policy monitoring, evaluation and supervision was fairly in line with their mandate and aligns with postulations of Neely (2015). Other variables associated with the commitment to the ideals of policymaking were relatively in good standing except the inadequacies of policy pretest mechanism and policy analysis techniques. In a study,

Ongolo-Zogo et al. (2015), noted non adherence to review and evaluation of government policy documents in compliance to the policy operational framework. The importance of policy pre-test before implementation was adjudged very appropriate, along with policymakers' organization routine practice of engaging with manual assessment to determine prospects of policy documents. This speaks to the fact that though pretest/assessment was been considered, going on manual approach hinders precise outcome. The study, observed the inaccurate measures taken to determine the appropriate policy option among several alternatives if the decision is not informed by a substantial evidence (El-Jardali et al., 2012; Oliver et al., 2014). A development that highlighting the import of optimizing computing centered approaches in a twenty-first century health system policymaking process reducing the errors due to latency of assumptions (Ghavifekr & Rosdy, 2015; Gartner, 2019).

5. CONCLUSION

The bane of evidenced-informed policymaking is ability policymakers to locate, access, assess and audit information at their disposal for uptake in decision-making. Findings in this study tells how computing techniques and its subsequent emerging innovations proves to be very instrumental supports in realizing this purpose. It highlighted the inevitability of diverse computing technology approaches that aid and facilitate evidence-informed policymaking process, where key stakeholders are supposedly well equipped to optimize them.

Unfortunately, this study revealed high capacity constraints among health policymakers' in terms of engaging the computing dynamics to manage and transform information into relevant evidence for policymaking. A pool of information may end up being useless or misleading except it is subjected to scrutiny through appropriate computer-aided scientific auditing process for validation. The near absence of this process in most sensitive sectors of the public service poses grave concerns and a pointer to the crises-like situations across socioeconomic domains – probably a factor of evidence-striped policy vacuum.

Policymakers requires an improved and routine capacity enhancement in this regards to get abreast with current and evolving trends in policymaking in Nigeria. The record of overwhelming willingness to adopt and optimize computer-aided technique in this study is quite assuring, envisaging a swift switch that strengthens the policymaking process for great impactful outcomes. It presupposes an inquest of competitive alternatives of several policy options geared towards abating numerous health inequities in Nigeria.

6.Recommendations

What follows are reccomendations based on the findings from the research

1. Government should prioritize routine capacity enhancement training for policymakers to up-skill in computing technology dynamics, as well as make deliberate investment in critical infrastructures that facilitates innovations in technology.
2. Policymakers should be mandated to prioritize the optimization of pertinent computing techniques and ensure regular utilization of same in refining evidence tool for policymaking.
3. The government should provide appropriate policy direction in the health sector by defining and championing a strategic computing innovation pathway to policymaking and implementation.
4. The government to routinely orient/refresh policymakers' consciousness towards evidence use in policymaking and create a computer-driven rapid response mechanism for evidence demand and uptake among policymakers.

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