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Behavioural Change Wheel to Scale Up Diabetes Care in Delta State Nigeria: Perspectives of Stakeholders

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ABSTRACT

Background: Intensive diabetes care educational programs improve self-management outcomes of the disease. However, the challenge remains the behavioural change wheel (BCW) of stakeholders for the scaling-up and sustainability of these programs.

Objective: To investigate the perceptions of stakeholders about their BCW in scaling-up diabetes self-management (DSM) programs in health facilities in terms of capacity, motivation and opportunity.

Methods: This mixed method study was carried out on two different opportunistic occasions. First, was the convenience sampling survey on individual primary healthcare stakeholders attending a diabetes research workshop in Novena University, Nigeria. The quantitative and qualitative data were analyzed descriptively and thematically, respectively. Second, was behavioural naturalistic observation of health institutions from 2018-2024 and the data were analyzed descriptively.

Results: The study observed poor-fair perception towards the capacity (poor-fair 59%, good 41%), motivation (poor-fair 98%, good 2%) and opportunity (poor-fair 72.1%, good 27.9%) of stakeholders. Naturalistic observations show that health facilities were able and willing to collaborate with academics to deliver diabetes care through outreaches. Yet, labor turnover was a common threat, whilst there are varying strengths, weaknesses, and opportunities with all organizational behaviours.

Conclusion: The study shows that private and public healthcare facilities can work with academics in providing sustained DSM programs. However, the perception of poor attitude by participants towards various stakeholders is one component of the BCW to investigate. Furthermore, organizational behaviour appears to indicate that private healthcare facilities with adhocracy or clan cultures are less supportive than those with hierarchical structures.

Keywords: Behavioural Change Wheel; Capacity; Motivation; Opportunity; Diabetes Patients; Intensive Education; Delta State

Abbreviations: BCW: Behavioural Change Wheel; DSM: Diabetes Self-Management; LMIC: Lowe-Mid-Income Countries; CMO: Capacity, Motivation and Opportunity; GMRDO: Global Medical Research & Development Organization; CMHS: College of Medical and Health Sciences; PCH: Public and Community Health; NR: Non-Responses

Introduction

Diabetes is on the rise across the globe, and poorly resourced lowe-mid income countries (LMIC) are at the mercy of sustainable diabetes self-management (DSM) programs (Shirinzadeh, et al. [1]). Globally, an estimated half a billion people suffer from diabetes with the burden more prevalent in LMIC (International Diabetes Federation, [2]). Nigeria, the most populated country in Africa has over 1.7 million people with the disease and compounding the problem is the number of undiagnosed or untreated cases, which constitute the high percentages of those with diabetes (Fasanmade, et al. [2,3]). In Delta State of Nigeria, a study carried in Ndokwa West Local Government Area reported a diabetes prevalence of 5.40% (Nwose, et al. [4]), while another screening reported 56.8% prevalence of hypertension (Anyasodor, et al. [5]). Though there is yet to be a gold standard for lifestyle interventions in some populations (Gamble, et al. [6]), the primary goal in management of diabetes is to maintain metabolic control and to reduce the risks of diabetes related complications (Miller, et al. [7,8]). However, to achieve acceptable and optimum metabolic control, patients should exhibit DSM behaviours, consistent and sustained for life. This confers responsibility on the patients hence, diabetes patients must be empowered with knowledge and skills to take responsibility for management of the disease (Weitgasser, et al. [9]).

Consequently, there is a shift among healthcare professionals and other stakeholders in diabetes care to the establishment of programs to educate patients about DSM (McGill, et al. [10-12]). Sustainability of DSM education programs is key to reducing the prevalence of the disease in Nigeria including Delta State (Okonofua, et al. [13-15]). In achieving and sustaining a systemic i.e., well-coordinated diabetes education program, stakeholders including the ministry of health, hospital management board, health care professionals, diabetes patients, academicians, non-governmental organizations have a crucial role to play (The Federal Ministry of Health, [16]). In the context of organizational stakeholders' role, the BCW of each organization is a factor that impacts on the operations and success of the DSM program. There are four known types and archetypes of organizational behaviour (Table 1), and organizations could have a mixture of the behaviours. This study therefore assessed the perception of stakeholders towards sustainability of DSM programs in health facilities using the behavioural change wheel (BCW) concept of capacity, motivation and opportunity (CMO) (Johnson, et al. [17]).

Table 1: Summary of types and indications.

Types (Chalmers, et al. [27,28])	Archetype synonyms (Chalmers, et al. [26,28])	Healthcare emphasis (Chalmers, et al. [28])
Adhocracy	Developmental	Innovation and adaptation. Novelty, research and technology
Clan	Group	Cooperation and teamwork. Mentorship and facilitations
Hierarchical	Hierarchy	Control. Compliance to standard protocols to ensure patients' care and safety
Market	Rational	Profit consciousness. Patient volume with triple bottom line

Specific Objectives

1. To assess the perceptions of individual stakeholders in DSM on BCW
2. To determine organizational BCW for sustainable DSM program.

Methods

Study Design

This was a mixed methods study. Individual participants were recruited by convenience sampling during a research workshop, which occurred at the Novena university in June 2018 (Akuopha [18]). For the first specific objective, a survey was employed using a questionnaire with Likert-scale and open-ended components. For the second specific objective, observations were made by the Global Medical Research & Development Organization (GMRDO), following the descriptive naturalistic approach. In this method, observation of participants in their natural setting i.e., without intrusion or influence on the behaviour was carried out (Rogelberg [19]). Studies note that the researcher may be required to enter the natural environment of subjects to observe actions of interest (Scholes [20]), and the observation can occur over the years i.e., takes a long time and applicable to healthcare providers (Carcone, et al. [21,22]). Hence, this report covers 7-years (i.e., July 2018 to July 2025) period of GMRDO's collaboration with five (5) organizations in running diabetes outreaches (Ezenwa [23]).

Ethical Considerations

Ethical approvals for diabetes self-management were granted by relevant authorities of Novena University as well as Delta State Ministry of Health. For the survey, consent to participate was assumed by voluntary response to the survey questions, and this is evident in level of response and non-response rate being less than the total participants (Table 2). In the naturalistic observation, ethic of non-interference was followed.

Study Area

The study was conducted in communities surrounding Novena University in Delta State, Nigeria, located approximately a two-hour drive from the state capital, Asaba. The primary collaborating body was the College of Medical and Health Sciences (CMHS), particularly the Department of Public and Community Health (PCH). In addition, four health facilities within the Ndokwa/Ukwuani community served as collaborating organizations.

Study Population

The survey involved individual stakeholders such as health care professionals, academicians, health students, civil society organizations who attended the workshop from 4th to 6th of June 2018. For the observation of organizational behavior, besides the CMHS, four collaborating organizations comprised health facilities and included:

- Novena Health Centre. Facility of CMHS offering primary healthcare services
- Donak hospital Kwale. A private facility offering primary and secondary services
- Catholic hospital Abbi. A mission facility offering primary and secondary services.
- Community Health Centre, Ushie. A public primary healthcare facility

Instrument for Data Collection

For the first objective, quantitative survey instrument for data collection was a developed BCW Likert scaled questionnaire of four sections. Section one comprised the capacity, motivation and opportunity of the ministry to health to sustain diabetes care education programs. Section two comprises the capacity, motivation and opportunity of the state hospital management board to sustain ongoing diabetes care education programs. Section three comprises the capacity, motivation and opportunity of the healthcare professionals to sustain ongoing diabetes care education programs. Section four comprises of the capacity, motivation and opportunity of the diabetes patients to sustain ongoing diabetes care education programs. Qualitative data comprising of notes were also taken during the data collection. For the second objective, another Likert scale was used to grade the organizations.

Sample Size

The sample size comprised all participants who attended day-3 of the workshop, for the first specific objective; and all 5 collaborating organizations for the second specific objective and duration of study.

Method of Data Collection

The survey data were collected after the workshop in 2018; and the participants responded to questions on a Likert scale of 1-3 where 1= poor, 2= Fair 3= Good of the various groups (ministry of health, hospital management board, health care professionals and diabetes patients) in their ability to adjust to the BCW to sustain ongoing diabetes care educational programs in Delta State in terms of capacity, motivation and opportunity. Participants' responses to poor, fair or good were counted and documented. In addition, the verbal responses of the participants on suggested ways of improving diabetes care in Delta State during the discussion sessions were also documented. For the second objective, three of the research team members who are not directly employed or involved in day-to-day business of any of the five organizations used Likert scaled tables to grade each of the organizations on specific behaviours.

Data Analysis

The data were analyzed descriptively with Microsoft excel and presented in frequencies, percentages and mean.

Results

In the survey, there were 15 respondents comprising 64.3% males and 35.7% females. However, it is observed that none of the questions received 100% responses. The non-responses (NR) in the survey averaged 19% (Table 2). Responses to the various questions varied for the different stakeholders, but the perceptions are generally poor (Table 3). Overall, 59% of respondents indicate less than good level of capacity, while poor motivation and opportunity are indicated by 97.5% and 75% of responses, respectively; with motivation/ attitude being lowest (Figure 1). In the naturalistic observational evaluation among the six organizations (Table 4), EBGH and NHC are deemed to have similar behavioural traits. The remaining four were found to exhibit varied distributions in types of behavior (Table 5). A further critical review revealed that Donak Hospital recorded the highest overall score, followed by CMHS.

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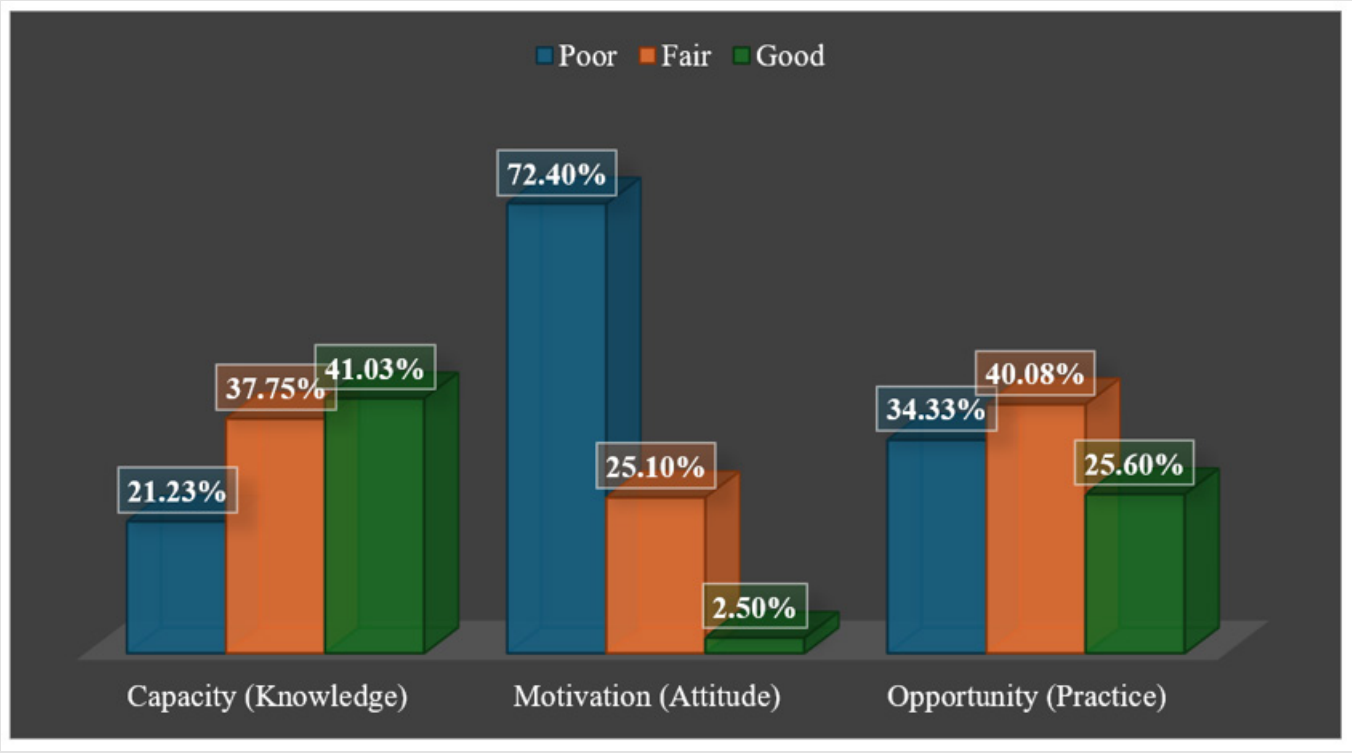

Figure 1: Overall perception of behavioural change wheel among the respondents.

Table 2: Proportions of responses and non-responses in the survey.

Stakeholder	BCW components	NR	Response	NR rate
Ministry of Health	Capacity (Knowledge)	6	8	40%
	Motivation (Attitude)	2	12	13%
	Opportunity (Practice)	2	12	13%
Hospital management	Capacity (Knowledge)	1	13	7%
	Motivation (Attitude)	3	11	20%
	Opportunity (Practice)	4	10	27%
Healthcare professionals	Capacity (Knowledge)	0	14	0%
	Motivation (Attitude)	1	13	7%
	Opportunity (Practice)	4	10	27%
Patients	Capacity (Knowledge)	5	9	33%
	Motivation (Attitude)	4	10	27%
	Opportunity (Practice)	3	11	20%
Average		2.92	11.08	19%

Table 3: Perceptions of the stakeholders regarding behavioural change wheel.

Stakeholders	BCW components	Poor	Fair	Good	Average
Ministry of Health	Capacity (Knowledge)	0.00%	25.00%	75.00%	100%
	Motivation (Attitude)	75.00%	25.00%	0.00%	100%
	Opportunity (Practice)	0.00%	16.70%	83.30%	100%
Hospital management	Capacity (Knowledge)	0.00%	53.80%	46.20%	100%
	Motivation (Attitude)	60.00%	30.00%	10.00%	100%
	Opportunity (Practice)	20.00%	70.00%	10.00%	100%
Healthcare professionals	Capacity (Knowledge)	7.10%	50.00%	42.90%	100%
	Motivation (Attitude)	84.60%	15.40%	0.00%	100%
	Opportunity (Practice)	90.00%	10.00%	0.00%	100%
Patients	Capacity (Knowledge)	77.80%	22.20%	0.00%	100%
	Motivation (Attitude)	70.00%	30.00%	0.00%	100%
	Opportunity (Practice)	27.30%	63.60%	9.10%	100%
Average		42.65%	34.31%	23.04%	100%

Table 4: Summary evaluations.

Criteria	CHA	Donak	EBGH	NHC	P' PHC	CMHS
Adhocracy	2	1	3	3	4	4
Clan	1	2	4	4	3	2
Hierarchical	4	3	2	2	2	3
Market	3	4	1	1	1	1
Total	10	10	10	10	10	10

Table 5: Likert scaled comparison on factors of organizational behaviour.

	Criteria	CHA	Donak	EBGH	NHC	PHC	CMHS
Determinants (scale of 3)	Employee interaction	2	1	3	3	3	3
	Leadership engagement	3	3	1	2	1	2
	Result focus	3	3	1	1	3	3
	Research interest	2	2	3	2	1	2
	Financial support‡	1	2	2	2	2	3
Changes – personnel turnover	Leadership*	1	3	2	2	1	2
	Trained staff*	2	3	2	1	1	1
	Decision making delegates*	2	3	1	1	1	2
	Response to meeting	2	3	1	1	2	3
	Events 2022-2024**	2	3	1	2	3	3

Note: ‡1: financial beneficiary, 2: in-kind benefactor; 3: financial benefactor.

*Occurrence rating: 1. ≥5; 2. 2-4; 3. ≤1.

**Number of events in last 3years.

Discussion

In the overall perception of the Behavioral Change Wheel, respondents showed limited capacity to scale-up and sustain diabetes self-management programs in the state indicated by 59% of respondents; poor motivation and lack of opportunity indicated by approximately 97.5% and 75% of responses, respectively.

Overall, the respondents exhibited a negative perception of the capacity, motivation, and opportunity of the ministry of health, hospital management board, health care professional, and diabetes patients to scale-up and sustain diabetes care education program in Delta State. The study recommends increased working synergy among the various stakeholders to scale-up and sustain diabetes education program in Delta State. Ministry of health and hospital management should consider increasing allocation of resources to manage the rising prevalent non-communicable diseases such as diabetes. Healthcare professionals should be further encouraged to specialize in endocrinology in order to expand the pool of endocrinologists within the state Also, multidisciplinary approach including team work should be encouraged among health care professionals in sustaining diabetes care at health facilities. For the patients, increase awareness of all aspects of the disease should be embarked upon regularly while equipping the patients with skills for DSM.

On the second objective, it is observed that Donak hospital has the highest summative score, followed by CMHS. It is also observed that EBGH and NHC, closely followed by PHC have the lowest behavioural traits. It is noteworthy that on one hand, Donak hospital and the CMHS are similarly rated for hierarchical behaviour but opposite in terms of clan and market focus, while EBGH, NHC and PHC are very closely rated to possess the same distribution of behavioural characteristics. It is inferred from the observation that while no single organizational behavioural trait may determine potential to support sustainability of diabetes self-management outreach program, the hierarchical trait could be positive, while adhocracy and clan traits would be the opposite. It has been known that behavioural and economic factors influence the success of collaborative relationships between organizations (Brechan [24]). Organizational behaviour is underpinned by the cultural perspectives of the institution, which is influenced by external and internal factors. The external factors are environmental forces beyond the organization's control e.g., economy, politics, and technology (Hassan, et al. [25]). Internal factors include broad range of determinants that make or mar a project such as employee interactions, leadership and result orientation amongst others (Hassan, et al. [25-27]). Organizational changes and culture are very associated with each other, and these influences staff turn-over (Tadesse Bogale [27]).

Implications for Further Research

"The four organizational cultures are adhocracy, clan, hierarchical and market (Chalmers, et al. [27,28]). These are synonymous with archetypes that are referred to as developmental, group, hierarchical and rational (Chalmers, et al. [26,28]).

- Adhocracy/Developmental culture focuses on risk-taking innovation and change. This has an external focus and emphasizes flexibility.
- Clan/Group culture focuses on norms and values associated with affiliation, teamwork, and participation. This archetype has an internal focus and emphasizes flexibility.
- Hierarchical culture reflects the values and norms associated with bureaucracy. This has an internal focus and emphasizes control.
- Market/Rational culture focuses on efficiency, productivity, and achievement. This archetype has an external focus and emphasizes control" (Sasaki, et al. [26]).

It is noteworthy that employees are the only factor that keeps the organization running. When individuals in positions of leadership show respect for their subordinates, it inspires them to contribute" (Tadesse Bogale [27]). Moreover, adhocracy culture is indicated to be better for external integration, hence, internal factors constitute a precondition for external relationships to achieved desired outcomes (Talib [29]). In terms of moderating organizational culture to enhance successful collaboration, it has been recommended to have collaborative decision-making, including but not limited to negotiation of constraining policies, with reciprocal representation collaborating partners (Lower-Hoppe, et al. [30]). The Competing Values Framework evaluation model dichotomizes the organizational cultures along 2 x 2 perspectives (Chalmers, et al. [28]):

- **Factors:** internal (clan & hierarchy) versus external (adhocracy & market) foci
- **Leadership:** control (hierarchy & market) versus flexibility (adhocracy & clan) foci

Nigeria has a National Guideline on the Prevention, Control, and Management of Diabetes Mellitus (Orji, et al. [16,31]). However, this guideline would need to consider integration of potential collaboration between non-governmental organizations and university-based researchers with private and public health facilities. This is important considering the necessity of collaborative decision-making, which impacts on policies that could make or mar public health outreaches (Lower-Hoppe, et al. [30]). Perhaps, it is pertinent to reiterate that internal determinant factors include employee interactions, leadership, result orientation, and staff turn-over (Hassan, et al. [25-27]).

Limitation of Study

First, the survey is based on convenience sampling during a research meeting. Recruitment was limited to attendees to the event hence a small sample size. Further, response rate averaged 11.08/14,

but cognizance is given to non-response bias (19%) as below the acceptable limit of 30%. Second, the evaluation of organizational behaviour is discretional or subjective and hereby acknowledged as a limitation.

Conclusion

This study has investigated the perceptions of individual stakeholders in DSM on BCW and determined organizational BCW for sustainable DSM program. On the first objective, it is observed that the BCW for all stakeholders are poor, but poorest of all components is motivation. On the second objective, it reasoned that healthcare facilities with a predominant hierarchical behavior may be more amenable to supporting the sustainability of DSM program. These observations could be integrated into the existing National Guideline on the Prevention, Control, and Management of Diabetes Mellitus.

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