SCHOOL HEALTH EDUCATION FOR COVID-19 PROTOCOL ADHERENCE: APPLICATION OF PRECEDE-PROCEED AND HEALTH BELIEF MODELS BY HEALTH RESEARCHERS

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ABSTRACT

The use of theories and models have been an herculean task for researchers in health education due to dearth of materials plus absence of the required knowledge on how to apply theories to researches and practice by practitioners. The emergence of COVID-19 pandemic became a global threat requiring the efforts of all professionals to maximally put a stop to the spread of the virus by adhering to all the precautionary measures to limit the contagiousness of the infection. The application of PRECEDE-PROCEED and Health Belief Models (HBM) were explicitly discussed in the paper while comprehensive information is provided on the place of health education and school health programme in limiting the spread of communicable and non-communicable diseases through adherence to WHO Protocols. The two models were lucidly discussed and how they can be used in carrying out health intervention researches. How health education intervention can be applied to modify health behaviour positively were exhaustively narrated and school health education was recommended to be taught by certified health educators in school for health behaviour adjustment among learners at their formative age.

Key Words: School Health, Covid-19, Protocol Adherence, Precede-Proceed, Health Belief Models.

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Introduction

Health as a multidimensional term is more than mere absence of diseases hence, to be healthy involves several scopes among which are: physical, mental, social, spiritual, political and emotional statuses, which are meant to be functioning at the optimal levels every time. Ever since human beings have lived, health has been a great concern of every individual, community, society and country hence an age-old concept (Sharma, 2017).

Having perceived good health should not be the main goal of life but instead a vehicle to reaching one's goals of life (Cottrell, Girvan, Seabert, Spear & McKenzie, 2018). Children are said to be prone to various injuries and infections because of their level of vulnerability occasioned by immature immune system, lack of adequate knowledge about preventive precautionary measures available to prevent diseases and injuries which can be caused by accident and other behaviours predisposing them to disease conditions. Therefore it is important for health researchers to regularly beam research efforts towards preventing ill-health conditions among the children to reduce incidences of diseases among the young population. Human health is very important for optimal performance and functions.

Health Education as panacea to COVID-19 Protocol Adherence

The Joint Committee on Health Education and Promotion Terminology in the year 2000 as quoted by Gold & Miner(2002) defined health education

as "any combination of planned learning experiences that is based on sound theories which provide individuals, groups, and communities the opportunity to acquire information with the skills needed to make quality health decisions which implies that adherence to the lists of COVID-19 protocols requires sound knowledge that will inform positive health behaviour changes directed at disease prevention." The World Health Organization (1998) defined health education as "comprising consciously constructed opportunities for learning involving some form of education put in place to enhance health literacy: knowledge enhancement, and life skills improvement that are friendly to personal and communal health".Green and Kreuter (2005) adopting PRECEDE-PROCEED model defined health education as **"**any planned combination of learning experiences designed to predispose, enable, and reinforce voluntary behavior conducive to health of people at every locations and milieus." We can therefore posit that the principles of health education are systematic in nature involving designed application that works with scientific principles. Also health education delivery involves sets of strategies instead of one, such as pamphlets, use of health education brochures and audio visual devices; enhancing simulations; case studies analysis; taking part in group discussions. Health education is not limited to the responsibilities of specialists but one of the tasks of adults in charge of children's education, primary among them are parents and teachers. Experts, particularly those from the health system, are subordinates in the education process, which is led by parents and teachers. Health education has been defined in several ways. Moronkola (2002) described health education as a concept, discipline, course of study, approach or method by which right health information is made available to people and simultaneously stimulating positive health attitude and practices in them to promote personal and community health.

Education is one of the primary tools used to assist people and community members in developing health friendly behaviors and in modifying lifestyle patterns that predispose people to health risks. Health instruction helps individual in attaining health knowledge and skills to develop positive health attitude that are vital to success in school and the workplace, such as setting personal health goals, resolving conflicts, solving complex problems, and communicating effectively (Schoener, Guerrero, & Whitney, 1988). This implies that health education is an eye-opener to the way of success in daily events. Health education according to Bolajoko (2004) is the chief approach for preventing the introduction of predisposing or risky health behaviours which should take place at all levels. Health education may be by informing the public on mass media and better still in school-based programmes. It also includes the appraisal of what is known about diseases, habits' assessment and population attitudes in relation to epidemic nature of diseases as well as proffering solution to noticed deficiencies. Likewise, in the National School Health Policy, Health instruction is for life to promote health at all levels; therefore importance should be placed on necessary skills for enhancing suitable health behaviours and practices as against just theory-based teaching. Skill-based Health instruction that is to promote the advancement of sound health awareness, personal disposition and other indices among the learners as this is geared towards achieving the goals and developmental needs of learners.

Health education then became the process of assisting individual in making knowledge able plans on issues affecting the learners' personal health and that of the community such as adherence to COVID-19 protocols which is what is primordially required to prevent the spread of the disease globally. It involves giving health instructions both at home, schools and other public places: churches, mosques, market, stores and health/medical outlets. Delivery of health education through School health programmes could become one of the most efficient means to significantly improve the well-being of young people because it will afford them the opportunity to learn concepts relating to health and wellness issues(Osuorah, Ulasi, Ebenebe., Ekwochi .,Onah., Ndu & Asinobi, 2016). Health education assists students to become knowledgeable of the nitty-gritty of good health. School health education components are: to manage stress and conflict, a set of skills to assist students to develop sound consumer health knowledge and to make better

decisions in the face of contradicting information, thereby making them live healthier lives. For these reasons, school health education ought to be an academic subject demanding suitable resources. School health instruction programmes are most efficient when family members are co-participants. Family members can complement on what children are exposed to in school as learning contents and interaction at home. The schools are meant to give basic message about carrying out health friendly decisions. Great numbers of parents are poorly knowledgeable to educate their children about the physiology of puberty, procreation, sexuality education, and sexually transmitted diseases and general disease prevention strategies. Parents require being aware on how important their roles are.

Developing positive health behaviours during childhood is always much easier and comprehensively effective when compared to changing behaviour during adulthood which agrees with the traditional statement which states that; dry fish is not malleable and hence can't be easily bent and molded to a newly desired structure/shape. It is a known fact that school captures a huge amount of the population in most communities of the world. Emphasis on school health is desirable because recognizing that the understanding of the knowledge of health information, attitude, practice and behavior begins at early in life which is better domiciled in school. This means that educating learners on health matters and hygiene, through incorporation of health instruction into the curriculum, and education of stakeholders are needed for healthy community which can be maximally utilized in preventing infectious diseases especially COVID-19 pandemic.

Corona Virus are class of viruses that causes ill-health condition ranging from common rhinitis to other diseases such as 'severe acute respiratory diseases syndrome' (SARS) and 'middle east respiratory syndrome'(MERS) (WHO, 2019). The novel corona virus was discovered by Chinese authority on January 7, 2020 and has been named SARS-CoV-2, it is a newly identified strain been previously identified in man. Not much has been known about it hitherto, though; human-to-human spread has been recognized. The acronym COVID-19 has been explained to mean: "CO" which stands for Corona, VI stands for virus, 'D' stand for disease while '19' stands for 2019- the year it was first diagnosed (WHO, 2019). The signs and features of the disease include cough, fever, shortness of breath, and dyspnea which may progress to inflammation of the lungs, multiple organ failure like renal system failure and death in severe cases. It has incubation period of 14 days. Infected individuals often exhibit symptoms within five to six days of exposure and sometime, an infected person may be asymptomatic.

The virus spread primarily through respiratory droplets, such as those generated when an individual incubating the virus, cough or sneezes. The virus multiplies when it gets to the upper respiratory tracts-nose, pharynx and upper part of the larynx. The mild cases of covid-19 looks and presents like rhinitis/common cold with symptoms like sore troth, running nose and fever (WHO, 2020). Some of the patients exhibit atypical symptoms such as diarrhea and nausea (Wang, Hu,& Hu, et al, 2020). The critically ill patients were older and had other underlying conditions such as diabetes and hypertension with other chronic cardiovascular diseases. It is also reported that the younger patients who died from the disease were said to die from cytokine storm which is a severe immune reaction in which the human body produces resistant cells and proteins that can damage other organs. It was reported that statistics from China revealed that some people in their 30s, 40s and 50s that died without prior medical conditions suffered from cytokine storm (Huang, Zhao, Cheng & Yin, et al, 2020)

Corona virus infection has spread throughout the globe producing a pandemic situation within a span of 20weeks spanning December, 2019 to April 2020, the virus has progressed from an epidemic outbreak in Wuhan, China, to cluster of cases in many countries of the world with over 149 countries reported outbreak of cases (WHO, 2020) becoming a serious pandemic. So far, the total fatality rate is more than 3% which is said to be high among the aged and people with underlining diseases. It became clear in the first week of March the explosive epidemic probable of the virus in the Middle East and Europe. The disease is rapidly spreading in areas with high population densities including urban areas, camp and camp-like settings and often overburdening weak health system. It is

now clear that the virus does not differentiate between settings and seasons (United Nations, 2020). The UN noted that if the world body fail to be proactive, the spread of the disease will be massive globally. Several countries of the world are ill equipped to support the health care staff and provide the necessary materials to treat the sick.

COVID-19 global infection has tremendously increased the global rate of infection ravaging the world with an ongoing humanitarian reaction, such as cholera, HIV, tuberculosis, malaria and measles. The importance of the assessment of COVID-19 into a global health issue is geared towards the call for action geared towards building behaviour that will develop a more health friendly behaviour in responding to pandemics. All important neighbouring, nationwide and world response to save lives, the societies and economies must be quickly stepped up.

School Health Education and COVID-19 Prevention

The School health education is part of planned scientific strategy put in place to enhance the optimal performance of learners in all ramifications such as physical, social, emotional and educational development. School health education was therefore planned to inspire and assist students to uphold and advance their health, prevent disease, and reduce health related risk behaviors (Wikipedia, 2018). Likewise, it is a skill-based education which enables learners to increase and reveal more and classy health-related information culminating into good practices that will also help to prevent diseases like COVID-19.

School health education is the combination of learning experiences initiated by school staff to widen the behavioral skills required by learners to cope with the challenges to health expected in, and the cognitive skills required to appreciate the further learning listed for, the student's immediate years ahead (Lawrence, 1982). School health education is the division of health education useful in schools and colleges, but is not necessarily restricted to classrooms or instructive methods to the health problems of childhood and teenagers.

School health programme is a key for achieving good and healthy life style for children and a sure way of nurturing them for future challenges in any nation (Okueso and Adekoya, 2018 a & b). School Health Education, as part of School Health Programme, will yield the following advantages to the community: increased school enrolment; enhancing excellent performance in school; Improving health conditions of adolescents and disease control. The afore-listed points can be possible using world health organization's (WHO) and United Nation International Children Fund's (UNICEF) approaches of School health education Figure 1. The approaches are described in health-promoting school and child friendly schools. These two approaches used pedagogy method as they are child or learner centered. So, school health education provides learners with the required awareness to thrive physiologically, emotionally and socially (Okueso, Olusesi, Adekoya, & Oparaeke, 2018). It contributes to students' strength to actively adopt behaviour that defend and uphold health and abhor/reduce health risks. With sound school health education, learners study fundamental health principles and widen the skills necessary to gain, assume, perform and uphold health-promoting and safe behaviors, including: analyzing the consistency and strength of media.

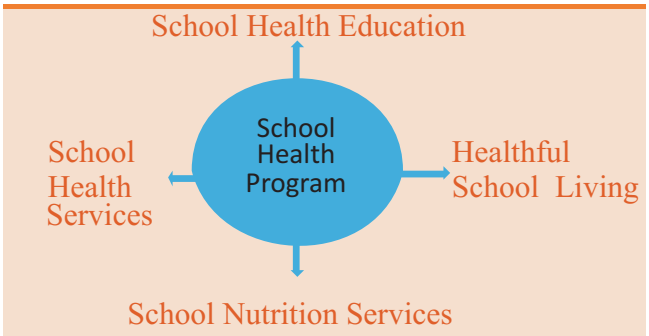

Figure 1: The school Health Program

Objectives of the review:

1. To succinctly discuss the concept of health education and school health
2. To vividly discuss how PRECEDE-PROCEED model can enhance positive behaviour change towards infectious disease prevention
3. To explain how HBM can be adopted for improving adherence to COVID-19 WHO protocol.

Statement of Problem

Adherence to the World Health Organisation COVID-19 protocols has been a very serious problem to both the Government and public health practitioners for several reasons because the actions involved are many and requires serious education and knowledge for the community members and also require some economic understanding for the people at both the rural and urban centres. Because comprehensive health education/health promotion indices are involved, it is therefore significant for health education and health promotion researchers to comprehend how theories and models can be applied to improve the knowledge of the community members towards preventing the spread of COVID-19 pandemic.

Application of PRECEDE-PROCEED Model for protocol Adherence

The PRECEDE-PROCEED was first applied in managing hypertension in the 1970 (Green, Levine & Deeds, 1975; Green, Levine, Wolle & Deed, 1979) Family planning strategies (Green, 1970) and for cost benefit evaluation of health education programmes (Green, 1974). The model was at that stage referred to as PRECEDE, acronym which stands for-Predisposing, Reinforcing and Enabling Constructs in Educational Diagnosis and Evaluation which constitutes the diagnostic and assessment component of the model. The aforementioned name remained trendy and was in use all through the 1980s (Green, Kreuter, Deeds & Partridge, 1980)

Spanning through the 1980s, the practice and profession of health education/promotion grew tremendously and consequently, the model progress and wide with good amount of health promotion benefits were included, hence it metamorphosed and referred to as PRECEDE-PROCEED. The PROCEED part is rule, Regulatory and Organisational Construct in Educational and Environmental Development which designates the intervention and evaluation phases. In the 1990s, the role of socio-environmental approaches was strengthened even further and the model emphasized ecological approach (Sharma, 2017). In this paper on COVID-19 adherence of protocols, the most recent part of the model available in 2005 was considered (Green & Kreuter, 2005). The model (figure 2) is divided into eight phases.

The 1st phase is called 'social assessment' which is concerned with the assessment of people's perception that can serve as the foundation for recognizing the quality of life in existence, and strategies such as available resources such as hand washing materials, face masks, and space for social distancing, social inspection, traditional grouping style, focus groups, central location intercept intervention, survey may be employed, physical data collection strategies. On the first phase, the assessing available resources may involve measuring the qualities of the available resources, human capital resources available that can be deployed for use. On social inspections, the point of entry into the location is chosen and the local participants are easily acknowledged, followed by assemblage of research resources and materials including human leadership and representatives.

The 2nd phase is referred to as 'epidemiological assessment', and it involves diagnosing the exact health issues contributing to or relating with the quality of life concerns acknowledged in the measurement such as the issues relating to the contagiousness of COVID-19 and how to reduce proneness to the infection. This phase identifies the aetiological factors in the three categories of hereditary, behaviour like poor sanitation both personal and environmental. The epidemiology evaluation consists of two parts-descriptive and explores to identify the incidence and prevalence of the disease to look at the pathological and aetiological determinants of infectious diseases such as Covid-19.

The 3rd phase referred to as 'educational and ecological evaluation', these are elements that deals and referred to as the trademark parts of the precede model as identify vulnerable elements which includes behaviour that makes people vulnerable to COVID-19 such as poor personal and environmental hygiene practices, enabling or reinforcing factors such as living in a crowded environment and failure to adhere to social distancing principles, failure to wear face mask and not regularly washing hands.

The 4th phase is 'administrative and policy assessment and intervention alignment'. Here, the programme of research meant to solve the problem of the study are identified and aligned with the priorities based on the available human and material resources such as identifying how water can be made available for hand washing and how

public members can be trained on how best the hand can be washed to limit the spread of the virus through contact. Motivation by providing nose masks and hand washing resources, challenges that may affect the proogramme are addressed and plans needed to assist the programme are highlighted such as poverty and lack of knowledge on what to do and what not to do and when.

The 5th phase is 'implementation'. In this phase several variables can affect or support the effect of the project such as investigating factors enhancing adherence such as enforcement and motivation by providing enhancing resources and assess the impacts of these enhancement. These variables relates to the project in which case available materials and objectives, the process outfits like the characteristics of the workers, the management's target, and organisational environment, the supporting environment, are also put into perspectives.

The 6th phase is 'process evaluation'. In this phase, the primary assessment evaluation is to investigatethe level upon which the project has been able to adhere to its preplanned process without any derailment. Take for instance, if four stages were designed to be followed, have all the stages been implemented as planned, and to what precision have these been strictly carried out for better evaluation. Also, the acceptability of the programme by the people it was meant to serve should be assessed.

The 7th phase is 'impact evaluation'. This evaluate instant effects of the intervention on its aimed behaviour change and sometimes environment with all its attendant predisposition and enhancing background. Such as programme intended to promote adherence to COVID-19 protocol would measure the rate at which people use face mask and social distancing protocol with the placement of hand washing equipment in all offices and how public members make use of the materials.

The 8th the last phase is 'outcome evaluation'. In this phase, health status assessment is carried out involving the morbidity, disability, health manpower assessment and other indices and the type and quality of life are evaluated to determine success or failure.

The rareness of PRECEDE-PROCEEDlies in its mutual style in taking records of the entire interrelationship between the population and their surroundings which agrees with the fact that activities geared towards health behaviour change should be of the same feature, and must be of several strategies not adopting a single strategy. PRECEDE PROCEED is hinged on health features within an environment, sociological theory, and economictheory to direct multifaceted thoughts. Using PRECEDE-PROCEED model require critical analysis of the various components and researchers that wants to apply this model in health education and health promotion research must be critical and analytical because the model involve high cost in the process of data collection, it is exhaustive and the evaluation process is herculean. Therefore the use of PRECEDE-PROCEED model has been limited by human and material resources need (Pasick & Burke, 2009) also; methodological issues are also noted in the use of the model such as the identification of relevant varied factors

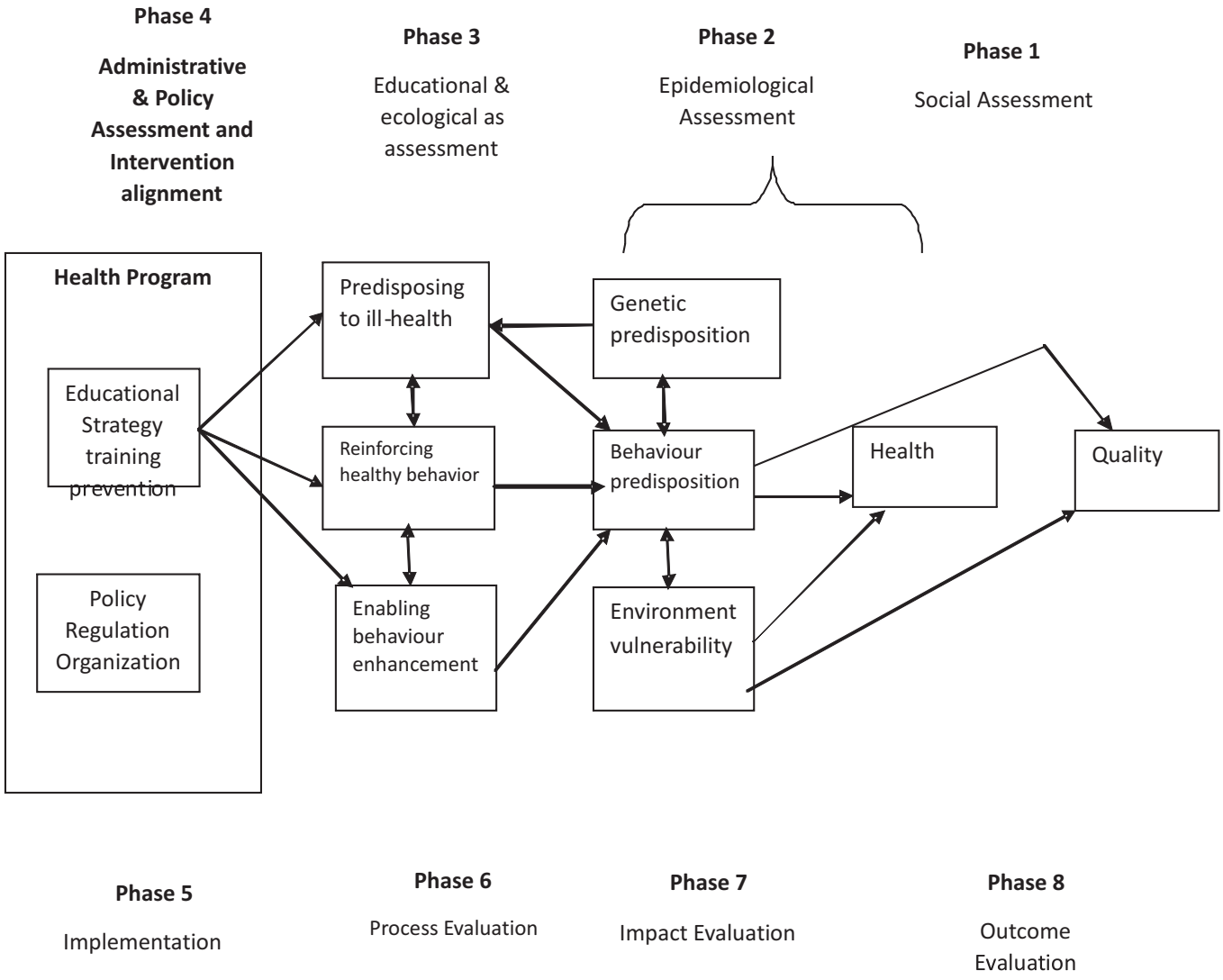

Figure 2: **PRECEDE-PROCEED Model for protocol Adherence .Adapted from Sharma, (2017)**

determining health behaviour change indices. Knowledge of these variables promotes detailed appreciation of the predictors of health behaviour which will help health education and health behaviour strategies explicitly.

Application of Health Belief Model (HBM) for WHO COVID-19 Protocol Adherence

For over eleven decades, HBM remained very useful and frankly speaking, a popularly applied conceptual model useful in health education and health behaviour intervention researches. Most of the time, it has been applied to explain changes and sustenance of positive health behaviour change and also as to guide health behaviour intervention research strategies for better understanding of the research framework.

Health Belief Model was used expansively in establishing the connections existing among health behaviour and health beliefs and also to create a loophole for research interventions (Champion & Skinner, 2015).

Association of HBM Construct with Adherence to COVID-19 WHO Protocols

WHO protocols include: i. thorough hand washing with soap and water very regularly, use of alcohol–based sanitiser. ii. Avoidance of crowd places, iii. touching of eyes, nose and mouth prohibited, iv. Adherence to respiratory system hygiene such as covering mouth and nose with your bent elbow or tissue when you cough or sneeze, v. stay home or self isolate even with minor symptoms

such as cough, mild fever of head ache until you recover, vi. Seek medical attention as soon as you are feverish, coughing and having difficulty in breathing 'dyspnea' (WHO, 2020). The general protocol has an adjustment in some specific situations such as: protocol for schools, for office and at workplace as it relates to individual community situations to limit the spread of the virus and also to contain the pandemic.

In this work, health belief model is for key preclusion through the health information regarding diseases avoidance or for specific immunity against susceptibility to communicable/infectious disease (Sharma, 2017)

Health belief model predicts that community members will be more likely to adhere to the WHO protocols of COVID-19 if they feel prone to the novel corona virus infection, and feel that COVID-19 is a severe acute disease, and perceive the threat that if there is poor adherence to the WHO protocols and perceive the benefit of adherence and have higher self-efficacy for developing resistance to the infection, and receive a cue to action such as environmental predictors to adherence including organizational and administrative principles. Adherence to positive health instruction guidelines has been appreciably connected with greater perceived susceptibility, lower barriers, higher benefits and cue in the form of counsel from health care specialists (Champion, Ray, Heilman & Springston, 2000; Philips, Kerlikowske, Baker, Chang, & Brown, 1998; Champion & Menon, 2004; Champion, 1984). The previous researches have indicated relationship between susceptibility and adherence to WH protocols.

Previous studies conducted using HBM as a construct among different populations of diverse ethnic, racial and socioeconomic status have resulted in different types of idea about vulnerability, beliefs and hindrances. People of diverse background have diverse perception about the deadly and virulent nature of covid-19 and the need to adhere to the preventive protocol. Because the infection is novel, most people are not aware of the nature of the disease and are not aware of the lethal nature of the disease hence the feeling of low susceptibility. Associated perception of low benefit from adherence to preventive instructions such as social distancing, hand washing use of masks will prevent infection. Economic factor, lack of knowledge, belief and poor education are likely to be barrier to adherence among the market men and women in Nigeria. Differences in specific perception about susceptibility to COVID-19 like the northern Hausas that drink water used in washing hand and converging in great number during burial to proof non-susceptibility to COVID-19 and unwilling to adhere to the WHO protocol, researchers in the field of health promotion education have reported dissimilarity by culture on descriptive authority of HBM theory (Skinner, Tiro & Champion, 2015) figure 3 is a building description on health education intervention procedure using health belief model (HBM).

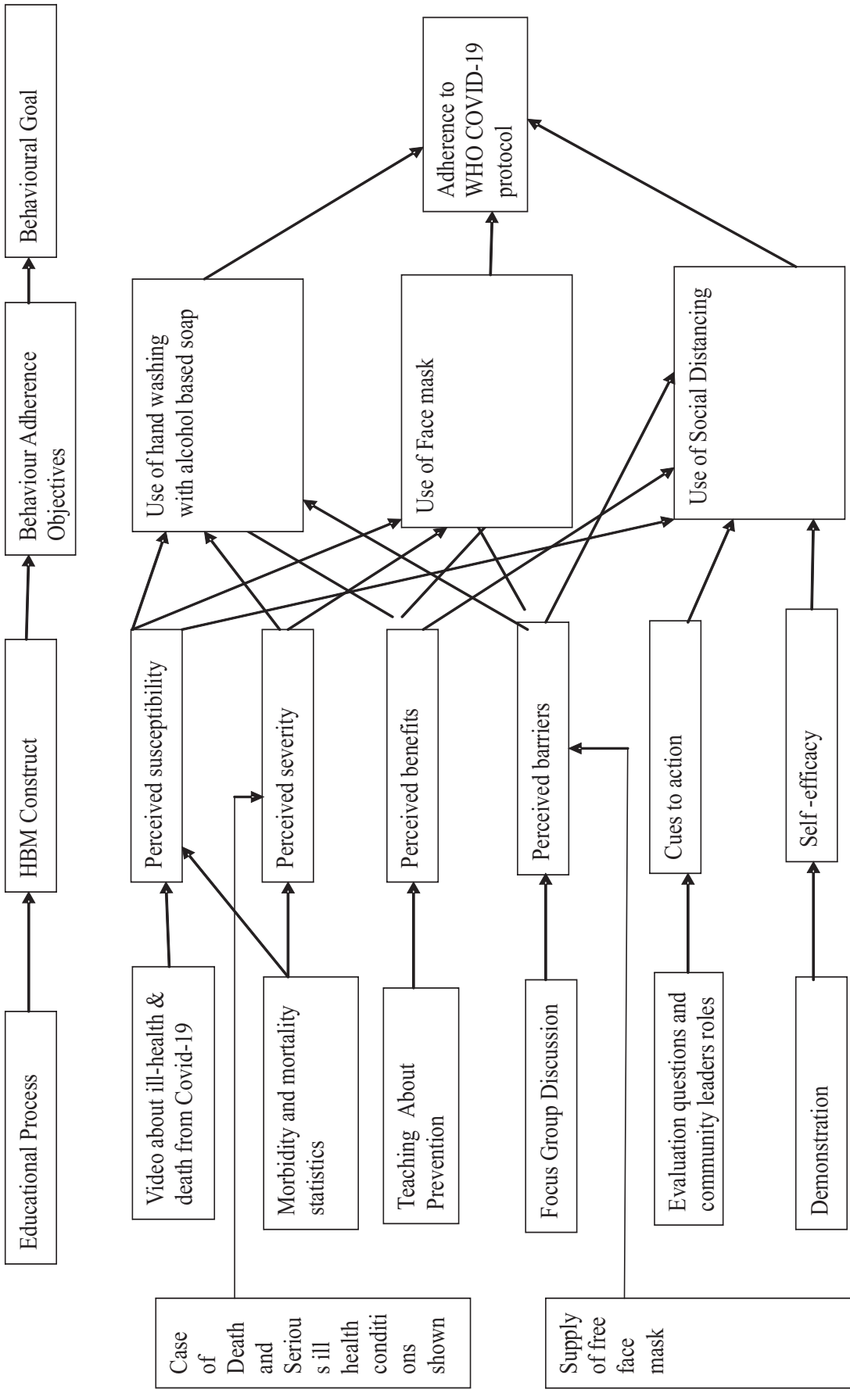

Figure 3: Application of Health Belief Model (HBM) Construct to Promote Adherence to WHO Protocol in Preventing the Spread of COVID-19

When applying HBM, health education research involvement would commence with restructuring the first independent variable of *perceived susceptibility,* which can be done by explaining disease severity through video of sick people and those death resulting from Corona virus disease especially from countries where health care facilities are adequate and functional, the video should provide explicit information on how people could contact the disease and show those reasons that makes people more vulnerable to the infection and it must also show that the disease has no border of ethnic, gender nor age identification towards segregation. Presenting data on the mortality and morbidity rate of Covid-19 which can be used to build construct on the *perceived severity* which will underscores the serious negative effects and consequences of failure to adhere to the prevention protocols. To influence the *perceived benefits*, information on the use of hand washing with process with alcohol based soap, access to face mask and explanation on how to use it, importance of its usage and the consequences of its poor uses, importance of social distancing the benefits of all the prevention strategies should be explicitly discussed to enhance the understanding of the need for adherence. For *perceived barrier*, participants should be involved in focused group discussion of five members each to brain storm on both the real and imagined barriers and after this, a larger group of ten should meet to discuss each of the barriers and how they can be surmounted to improve adherence to the use of facemask, hand wash, social distance and prevent touching of face and as incentive, the participants can be provided with hand washing equipment and standard facemask. To influence *cues to action*, the market men and women can be presented with evaluation questions to serve as reminder to help improve on the positive health behaviour of adherence to WHO protocols. To build *self-efficacy,* demonstration by a community leader in a small dramatized form to show example and shows the importance of adherence to the chosen positive health behaviour. Reinforcing the message about the need to wash hand with soap and water, use of hand sanitiser, social distancing and use of face mask.

For conducting research intervention in health education using health belief model following the six basic constructs, the following steps can be followed: i. on perceived susceptibility, the following educational methods can be applied- discussion highlighting the negative consequences of health behaviour, data presentation to buttress vulnerability, case study with risky outcomes, video films, role-play and drama on negative consequences, excursion to see the negative consequences. ii. on Perceived severity, the following educational methods can be applied- lecture, demonstration, video film, data presentation all audio-visual strategies, iii. On perceived benefits, the following educational methods can be applied- lecture method, interview guide, focused group discussion, problem solving strategies, iv. On perceived barrier, the following educational methods can be applied- brain storming, target group discussion, motivation through incentives, in-depth interview guide, v. on cue to action, the following educational methods can be applied- evaluation questionnaire, visual reminders, calls for action, group reminder, personal reminder, short message reminder, vi. On self-efficacy, the following educational methods can be applied- call for demonstration, demonstration by significant others, role play, stress reduction strategies.

Conclusion

Health education is an integral part of school curriculum. It is meant to be used through school health programme to provide the required knowledge and the required materials towards the improvement of health knowledge and application of theories that can help to improve adherence to the required protocols for the prevention of the diseases. Health researchers can apply both or either of the discussed models to elucidate and critically analyse research interventions following scientific principles.

Recommendation

The following recommendations are suggested:

(i) Schools should be a health–promoting milieu and also be child friendly to achieve school health education objectives.

(ii) Researchers in health education and health behaviour change should create the environment through which the appropriate theories can

be applied for positive health behaviour change.

(iii) Health education should be taught in all levels of education to inculcate the culture of positive health behaviour right from the school age.

(iv) Only the trained and qualified heath educators should be engaged in the teaching of health instructions in school

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