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Original Article

Complexity in public health interventions – Stakeholders' perspective: A qualitative analysis

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ABSTRACT

Background: Public health interventions are mostly composed of several interconnected actions and hence they are popularly referred to as “Complex”. The domain of complexity lacks clarity and the conceptual framework needs to be simplified and strengthened as till date most of the issues/concepts relating to this domain remain unexplored. This paper investigates the perception about complexity among people working in the area of public health.

Study design and methodology: We adopted a qualitative study design and conducted unstructured interviews/dialogues/focus group discussions among people working in the public health domain on their perception about complexity. The process was audio-recorded and the interpretations were summarised. Responses were consolidated on the basis of five major sources complexity as depicted by Medical Research Council, UK guidance.

Results and conclusion: This paper provides an outlook of people on how they perceive the complexity in public health interventions. Participants perceived complexity in a diverse manner which was evident from the varying responses obtained. Therefore there is a need for a strong theoretical base to understand complexity and also a concrete methodological framework to tackle it. The external validity of a public health research can be seriously affected in presence of complexity. Therefore it is necessary to adopt effective strategies to tackle complexity to obtain valid results.

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1. Introduction

“An intervention is a set of activities with a coherent objective to bring about change or produce identifiable outcomes”. Public health interventions involve collective actions to promote or protect health or prevent ill health in communities or populations.¹ These interventions differ from the usual clinical interventions in terms of (1) the target population (2) composition of the intervention (3) Implementation of intervention and finally (4) evaluation of outcomes. Unlike the latter, the former is not directed to a closely monitored group of people and is meant to cater to a wider group of people and in many cases the community itself. Further, they are typically composed of several interconnected actions.² Formulation or composition of such an intervention is judged by the context in which it takes place. Context is likely to change with time and place making it difficult to achieve a standardized intervention.³ As it is hard to define the “active ingredient” of a public health intervention, it is not possible to determine which is more important, the component itself or a combination of components to bring about the desired outcome/s.⁴ Due to the above stated reasons, public health interventions are deemed to be complex.

What is complexity?

“Complexity is the tendency of existing in a closely knit network wherein, it is very difficult (or even impossible) to dissect or isolate and study the influence of constituent parts”.⁵

According to Medical Research Council (MRC), UK guidance, “the complex interventions are those interventions that contain several interacting components”.⁶ The MRC guidance depicts five important sources of complexity;

1. The number of interacting components within the experimental and control interventions.
2. The number and difficulty of behaviours required by those delivering or receiving the intervention.
3. Number of groups or organizational levels targeted by the intervention.
4. Number and variability of outcomes.
5. Degree of flexibility permitted in the tailoring of the intervention.

Other than the above mentioned elements, presence of non-linear causal pathways between intervention and outcome (i.e., change in outcome not proportional to change in intervention) is an additional and a key source of complexity.⁷

Complexity acts as a barrier for not only generalizability of results of public health interventions but also for the evidence consolidation. Till date most of the concepts relating to complexity remain unfamiliar and therefore there is a need for it to be explored and the conceptual framework requires to be strengthened.⁷ This paper attempts to probe into various aspects of complexity and excerpts views of several people associated with the public health domain, in an effort to bring more clarity towards understanding the term complexity in public health interventions.

2. Methodology

A qualitative study design was adopted and a combination of in-depth interviews or unstructured dialogues and focus group discussions were incorporated. We primarily identified 42 public health professionals, who are closely associated with the discipline of public health either as public health stakeholders, students, researchers, faculty, statisticians and systematic reviewers. All the participants were institutional and recruited mainly through academic contacts i.e., the people in our professional network were requested to participate in our study. Ethical committee approval was not sought as we thought it is a general perception study which does not involve any ethical issues. A verbal informed consent was obtained and the sessions were audio-recorded. No incentive was provided for participation. We conducted 20 sessions in all, which included three focus group discussions and 17 in-depth interviews. The participants were queried on their perceptions about complexity in public health interventions. It was decided to continue with the sessions till information saturation (no emergence of new information or repeated occurrence of same information) was attained. The interviews/focus group discussions involved a moderator and a co-facilitator. Role of the moderator was to involve in conversation, where as co-facilitator was assigned the responsibility of audio-recording the conversation and summarizing entire discussion.

3. Data analysis

Views shared by participants were transcribed into a document. We made broad divisions of the perceptions based on opinions or ideas. The five sources of complexity as depicted in MRC guidance were regarded as themes for the consolidation of perceptions. This approach of qualitative data synthesis where the themes are derived from literature is referred to as “Deductive approach”.⁸ Particular codes were assigned for themes to facilitate easy consolidation of responses. Coding was performed manually.

4. Results

Out of the 20 sessions conducted, 17 were in-depth interviews, while three were focus discussions. Students and faculty who are closely involved in public health research were involved in focus group discussions. First focus group discussion was performed on a batch of 18 students, followed by the second one on a group of four faculties. The third focus group discussion also included three faculties. Each session lasted for an average of half an hour; maximum being 1 h 20 min and minimum being 24 min.

The broad divisions of perceptions about complexity in public health interventions along with corresponding explanations are as presented below:

4.1. Perception 1: “Complexity is the lack of control”

Unlike clinical interventions, public health interventions are not confined to an individual and not implemented in a

customized environment, where the sources of variation can be balanced in a robust way. Public health interventions are uncontrolled interventions, which lack replicability or generalizability and possess multiple components acting at different levels.

4.2. Perception 2: “Complexities are the difficulties that occur while implementing a public health program”

Public health interventions are conducted in an open environment, thereby making their implementation complex. While clinical trials involve homogenous groups that can be strictly monitored to achieve a high response rate, public health interventions on the other hand involve diverse population. Therefore, framing and implementing an intervention for a heterogeneous population that is uncontrolled is bound to be more difficult, requiring lot more resources in terms of time, manpower and funding. Uncontrolled nature of intervention contributes to difficulties such as poor response rate, high attrition rate and high switch over rate. Further, it is not guaranteed that observed outcomes are contributions of intervention alone; role of confounding factors such as social, economical, cultural, political and environmental influences cannot be undermined.

4.3. Perception 3: “Complexity is due to lack of representativeness of the intervention”

Public health interventions are guided by population characteristics and feasibility (mainly budget). In most cases, public health interventions are tailored according to feasibility, neglecting the standard requirement. Mismatch between these two aspects i.e., what is required to be delivered and what is delivered creates complexity. Composition of a public health intervention has to be based on ground realities. Resource allocation has to be prioritized according to evidences from the field.

4.4. Perception 4: “Complexity is created by population dynamics”

Public health interventions are “Pragmatic” and rely more on people's actions. In other words, they are people centric. Diversities in culture, customs, literacy and other factors lead to disparities in the uptake of intervention.

4.5. Perception 5: “Complexity is due to the competition from co-interventions”

Public health interventions are not standardized i.e., they cannot be delivered in a similar manner in all settings. Further, it is impossible to restrict the actions of people; people may receive the same intervention from several other sources as the promotion of a public health intervention can happen in many ways.

4.6. Perception 6: “Complexity lies in the research question or the problem”

Since the determinants of lifestyle related problems are multidimensional, the interventions to bring about a change

will also be multidimensional. This in essence makes these interventions rather complex and difficult.

4.7. Perception 7: “Complexity from the perspective of a health provider is different from that of the beneficiary”

From the perspective of the health care provider, complexity is in terms of achieving a wide coverage of the intervention, ensuring peoples' compliance and mechanistic of providing health care. In other words, implementation of intervention is complex.

For a beneficiary, complexity finds its roots in the utilization. The utilization process depends on various factors such as culture, belief, previous experiences, faith, fear, need and many others.

5. Consolidation of perceptions

Responses of participants have been consolidated on lines of the five major sources of complexity as put forward in MRC guidance.

5.1. The number of interacting components within the experimental and control interventions

Public health is complex because it is a very broad term. Public health deals with health of the population or community. Health by itself is complex. It is easier perhaps to study the health of an individual as compared to that of a community as it adds a layer of complexity. There are many parts or entities interacting with one another in ways not easy to predict. Establishing cause and effect relationship under such a situation is difficult.

5.2. The number and difficulty of behaviours required by those delivering or receiving the intervention

Public health interventions mostly seek a wide coverage and are directed to a population or a community. Heterogeneity/diversity/dynamics of population contributes to complexity. Diversities exist among people in terms of their age, gender, ethnicity, knowledge, attitude, decision making, needs and many other factors. Consequently, there is no way to obtain a standardized reaction to a given intervention. In other words, the responses of the participants to a given intervention cannot be identical and there will be variations in the way the people perceive and accept the intervention.

5.3. Number of organizational levels targeted by the intervention

A public health intervention has to be composed in accordance to the social, political, economic and political factors of its place of implementation. All these factors are broadly referred to as “contextual factors”. The context has a profound influence on behaviours and actions of people. The behaviours and actions of individuals are highly attributable to the environment in which they live. Consequently, as changes occur in the surroundings, it is very much likely to reflect on

the responses of people. The contextual factors also hinder generalizability/replicability of public health interventions i.e., the same intervention when implemented in different place or time is likely to produce different outcomes. Interactions among components of intervention also vary with the context.

5.4. Number and variability of outcomes

Due to the fact that public health interventions possess multiple components and are delivered at community level, it is difficult to have outcome measures which are valid and reliable across such a wide and heterogeneous population. Also, it will be impractical to have a primary outcome measure which measures the totality of effectiveness of entire intervention. Apart from this, complexity can be attributed to the fact that the observed outcomes are subjected to influence of other factors in addition to intervention (dilution of the intervention due to influence of co-interventions) and lack of clarity in the study methodology.

5.5. Degree of flexibility permitted in the tailoring of the intervention

Public health interventions always seek large coverage, are need based, require community participation and co-ordination with many other sectors thereby making it a complex exercise. i.e., the public health intervention delivered has to be compatible with/tailored according to the social, political, cultural, economical and environmental conditions of its place of implementation.

6. Discussion

The complexity in public health interventions is an important issue.⁹ Present study was conducted with an objective of understanding the perspectives of stakeholders of public health about complexity. Twenty discussion sessions were held with identified public health professionals and their opinion about the complexity in public health interventions has been documented and summarized. Broad divisions of the opinions have been made and each division has been elaborately explained. Consolidation of the perceptions has been conducted based on the five major sources of complexity identified by Medical Research Council (MRC), UK.

Views of stakeholders about complexity are diverse and all of them consider it to be a serious concern. Population characteristics, multi component intervention, numerous outcomes and contextual factors jointly contribute to complexity. One of the important responses about context is that it hinders the applicability of findings of a public health intervention study in other contexts or populations. This tallies with the observation made by Belinda et al in their article “Assessing the applicability of findings in systematic reviews of complex interventions can enhance the utility of reviews for decision making”.¹⁰ The major consequence of complexity is that, it causes difficulties in assessing whether the intervention is really acting in the way that it was supposed to. Other consequences include lack of generalizability of intervention and

failure to obtain desired data leading to the conclusion of poor effectiveness of intervention programme. Noyes et al⁵ and Anderson et al¹¹ also have a similar observation. Petticrew et al¹² agree to the research question being complex and Squires et al¹³ recommend a strong logical frame work for its formulation.

Therefore, from this study it is evident that complexity is not only due to the characteristics of the intervention alone. Complex nature is the property of the entire system. Characteristics of target population, context and varying outcomes are also the potential contributors for complexity.

7. Conclusion

The present study provides an insight into the stakeholders concept and perception of complexity in public health interventions. The varying responses obtained affirm the lack of clarity towards understanding the term complexity.

In the present era, where all health care decisions are based on firm evidence, the policy decisions pertaining to health of the public are not an exception. Public health evidence synthesis is a crucial task for which the complexity acts as a barrier. Therefore there is a need for a strong theoretical base to understand complexity and also a concrete methodological framework to tackle it. Clear cut definition of the target population, involvement of higher level administrators, local leaders and community leaders as the stakeholders, use of appropriate sampling technique, conducting pilot studies to understand ground realities and choosing an appropriate research question supported by a strong logical framework are some of the effective strategies to be adopted to handle complexity.

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Conflicts of interest

All authors have none to declare.

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