Using the concepts of positive deviance, diffusion of innovation and normal curve for planning family and community level health interventions

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ABSTRACT

In medical schools across the globe, students are taught about the “THE NORMAL CURVE” as a part of statistics unit of Public Health, Community, and Family Medicine. However, its potentials for explaining the subject of health education and behavior change are grossly underutilized. Through this article, we attempt to demonstrate that this can be sorted out by integrating theories of Positive Deviance and Diffusion of Innovation through extrapolation of the concepts of “THE NORMAL CURVE” for explaining or planning things and events in Public Health, Community, and Family Medicine.

Keywords: Diffusion of innovation, normal curve, positive deviance

Introduction

Public Health is defined as, “The science and art of preventing disease, prolonging life, and promoting health and efficiency through organized community effort.” Thus, active involvement of people is needed to ensure optimum public health. It is understandable that for any worthwhile community effort and active involvement of people will involve a change in behavior of public at large. However, in syllabus of medical schools across the globe, there is hardly any focus on behavior change-related teaching. Though there is brief exposure to the concepts of beliefs, attitude, taboos, norms, etc. as a part of the teaching related to Social Medicine/Medical Sociology/Family Medicine, there is lack of focus on integrated teaching, for example, use of the concepts of statistics for explaining this subject. Though in unit of Family Medicine/Community Medicine/Public Health students are taught by statisticians about the “THE NORMAL CURVE” (NC), its potentials to illustrate the concept of behavior change are grossly underutilized. Through this article, we attempt to demonstrate how this gap can be filled.

For example, main aim of all our health education efforts is behavior change in the target population. This is an important field of interest in Family Medicine, Community Medicine, and Public Health. Sometimes, it involves promotion of a new idea, which does not get diffused with the same speed across the whole population. The idea itself may take time to be accepted. Initially, it is a bit slow. Then it gathers pace. As far as people are concerned, some of them are quicker to adopt the innovation as compared with others.

In this context, Diffusion of Innovation (DOI) Theory was developed by Rogers in 1962, to explain how, over a period, an idea spreads through society. Here, the change implies that people demonstrate a different behavior than what they had been doing previously. For example, women may start using sanitary napkins instead of cloth. Here, for acceptance of the idea, people...
must perceive the innovative idea as useful to them. The more the perceived benefit, the quicker is the diffusion.

This theory categorizes and labels the adopters of innovation in any community as follow:—

1. Innovators (2.5%) – They are adventurous and interested in innovations, very enthusiastic about to take risks, and are frequently the first to adopt the new thoughts.

2. Early Adopters (13.5%) – They represent opinion leaders. They are next in line to adopt the new idea. They enjoy leadership roles and are very relaxed adopting newer ideas.

3. Early Majority (34%) – They adopt new thoughts before the average person. However, they need proof that innovation is helpful to them, before adopting it. Success stories and evidence of the effectiveness of innovations influence them.

4. Late majority (34%) – In routine life, they are usually critical of any new idea. They only adopt it after the majority has tried it. Information regarding how many other people have successfully tried the new idea appeals to them.

5. Laggards (16%) – They are very orthodox and conservative, the hardest group to convince. Either they do not adopt the idea or do it very late. Pressure from other adopter groups influences them.[4]

In Figure 1, the innovators (2.5%), lie on left hand side of a time frame (horizontal axis). Vertical axis denotes the number of acceptors. The curve describes the natural history of acceptance of a single innovation in a specific population.[4]

As per this theory, the adoption of an innovation is dependent on five main factors:—

1. Competitive advantage – The extent to which a specific new idea is seen as better than the previous idea, program, or product.

2. Compatibility – Whether the innovation is compatible with the values, cultures, and needs of the potential adopters in a specific population.

3. Complexity – Whether the innovation is complex to understand and use.

4. Testability – The level to which the innovation can be tested with before a commitment for adoption can be made.

5. Observability – Whether the innovation provides tangible results or not.

This theory has been used successfully in many fields like communication, agriculture, etc. In Family Medicine, Community Medicine, and Public Health also, DOI theory can be used to devise strategies to accelerate the change in the health behavior of a society.[4]

To explain this, we may use an example of doctors–patients interaction witnessed in hospital OPD settings in India. These days, lack of patient satisfaction from hospital services is being highlighted in media. In 2018, British Medical Journal reported that doctors in India see patients for barely 2 minutes. Such a short consultation adversely affects the quality of patient care. Over last 15 years, globally, new concepts have emerged about doctor–patient interaction, for example, patient-centered care and social prescription.[9]

These concepts were used in gynecology OPD settings in the Multi-Purpose Behavior Therapy (MPBT) room at PGIMER, Chandigarh, India [Table 1]. The main focus was upon active collaboration and shared decision-making between patients, family members, and health care providers. Here, after referral from the main OPD, patients were provided face-to-face as well.
as mobile phone/laptops-based counseling on nonmedicinal treatment, behavior therapy, exercises, yoga, dietary advice, and healthy lifestyle. The beneficiaries included antenatal women, cases of dysmenorrhea, uterine prolapse (degree I, II, and IIIa)/urinary incontinence, menopause, infertility, or osteoarthritis patients (mild/moderate). Here, women are counseled together with their family members. Queries are resolved at a leisurely pace with sufficient time devoted to each patient. This approach helped in empowering the women in self-care.

Initially, gynecologists were reluctant to refer cases to MPBT room and very few patients turned up. After a few weeks, with feedbacks from satisfied patients, there was drastic increase in attendance. Even doctors now regularly refer cases to us.\cite{7,8}

Thus, the knowledge of DOI theory can help in reducing the frustration of implementers when their efforts fail to elicit quick results initially. Despite some limitations of DOI theory, it is well documented that except for laggards, most people (84%) have a positive attitude for change, though the acceptance rate might be different. It is may be explained by the inherent variability in people’s behavior.\cite{9}

Another area where the idea of NC can be used for the explanation of people’s behavior is the positive deviance (PD) concept, coined by Marian Zeitlin in the 1990s. It fills the implementation gap of DOI theory by focusing on the behavior change agents. PD concept posits that often an idea to solve a tricky sociocultural problem lies within the society.\cite{10} PD approach aims to identify positive behaviors so that these may be used as examples to be emulated by the community. Diffusion here is an inside–out process with behavior change occurring through internal agents.\cite{11}

PD is defined as an approach to social change that enables communities to discover the wisdom they already have and then to act on it. Initially, PD gained attention when Zeitlen from Tufts University working on nutrition in 1980s observed that few children in poor societies were not malnourished like others. Based on her ideas, various social change interventions based on PD theory were imparted across the globe.\cite{12}

The key recommendations were made:–
1. Practicing PD develops strong sense of ownership within the community during implementation
2. PD is an effective communication tool to communicate at-risk groups
3. PD process helps us to understand the right content, context, and subjective norms. This enables us to develop tailor-made interventions for people
4. PD approach is culturally appropriate (respect the local knowledge), hence, easily acceptable for changing the behavior of a community
5. PD approach builds capacity and leadership in volunteers
6. PD is dependent on soft skills
7. Regular monitoring and supervision are involved in PD.

The team focused on what was going right in relation to children whose nutrition was significantly better than other malnourished children. There was less focus on community-wide issues. The knowledge gained from that experience were used to improve nutrition status across the society.\cite{13}

Another example is from a project “Malaria Consortium piloting PD in Cambodia (Sampov Loun) [Table 1].” This included meetings and storytelling for community orientation to explain the PD concept. Situation analysis was done by focus group discussions, establishing normative behaviors; and identifying potential positive deviants and successful PD behaviors and strategies. PD inquiry was done by In-depth discussions with potential PD candidates. Feedback session was conducted at the end to share the identified PD behaviors through interactive role plays and by identifying volunteers. It was found that a migrant worker (female) who has been visiting malaria-prone villages for 3–4 years never had malaria. She was considered as a role model of PD.

It was revealed later that her certain practices like using insecticide-treated net during sleep, wearing long-sleeved clothes, covering her legs and feet with krama (checked scarf) to prevent mosquito bites, and getting her blood test during fever were found quite useful for preventing malaria.

During the project, regular training of volunteers on communication skills and PD behaviors was also given. The implementation package included monthly meetings, on-the-job training of volunteers, participatory monitoring using maps, acknowledgement of volunteers, and handing over the project to community.\cite{13}

Lessons learned were as follow:–
1. Practicing PD develops strong sense of ownership within the community during implementation
2. PD is an effective communication tool to communicate at-risk groups
3. PD process helps us to understand the right content, context, and subjective norms. This enables us to develop tailor-made interventions for people
4. PD approach is culturally appropriate (respect the local knowledge), hence, easily acceptable for changing the behavior of a community
5. PD approach builds capacity and leadership in volunteers
6. PD is dependent on soft skills
7. Regular monitoring and supervision are involved in PD.

Again here, it is important to realize how the DOI, PD, and NC concepts concur.

PD concept:–
• As per this concept, 2.5% of people in any society will be positive deviants in consonance with “NC” perspective
• They will be the leaders, that is, the change agents
• Most (95%) of the members of a community will oscillate within the “normal” rage of expected behavior because of the “mass inertia”. They tend to ignore the values/norms which do not come under the 95% area of the “normal” distribution
• Remaining 2.5% of people will be negative deviants
• The innovators and early adopters (2.5% +13.5% as per DOI) welcome positive changes.\cite{14}
As per the NC concept, in any statistical distribution, some data will exist at the extremes (2.5% on either side). These are the deviants who show very different (positive or negative) outcomes as compared with the majority. Here, positive deviants will always be on the “right” side. They will create new “normal” which will shift the mean, always to the “right” side. Here, “time” dimension is disregarded [Figure 2].

Usually, we react to any idea/object/action as per its dichotomous classification by us as NORMAL (95%) or NOT NORMAL (5%), that is, OK or not OK. So, our perspective regulates our reaction or behavior to these to these ideas/objects/actions. If it is within our perceived range of “Normality,” we endorse it otherwise we oppose it. This sort of arrangement helps us in the enforcing the norms in the society. Also, usually, we maintain the SOCIAL ORDER by suppressing the deviants by ignoring/ridiculing/punishing them. Thus, identification of “normal” and “non-normal” behavior among the people can help us in adjusting our behavior change strategies accordingly. This will increase our chances of success.

The DOI theory is fundamentally premised on the following views:
1. Any innovation is external
2. It is expedited or pushed by a catalyst
3. It fills the existing knowledge attitude and practice gaps among the audience by the use of effective communication strategies
4. It is propagated by the influence of opinion leaders for the nonadopters.

Both PD/DOI concepts focus on behavior change [Table 2]. This PD approach for diffusing “new ideas and practices” has been employed in over 40 countries over the past two decades to address difficult social problems. Dramatic reduction in hospital-acquired infections in US hospitals is another successful example of a PD approach. According to Singhal and Greiner in 2008, adherence to hand hygiene protocols in US hospitals was between 35% and 40%. In that time, methicillin-resistant Staphylococcus aureus (MRSA) infections were quite common in US hospitals. Due to prolong survival and easy transmission, MRSA was considered as one of the dangerous pathogens among all other bacteria causing nosocomial infection. During sharp increment of nosocomial infections in US hospitals, some hospitals showed sharp declines in MRSA infections.

These hospitals were actually focusing on local solutions in the form of simple yet uncommon behaviors that prevented MRSA transmission in their hospitals.

The uncommon behaviors were as follow:
1. Patient refused to make eye contact with a doctor or nurse if he did not convince about hand washing of nurse before their checkup
2. An intensive care unit nurse who was not afraid to confront if surgeon breached the hand hygiene protocol in the hospital.

These individuals were “positive deviants” and they made important contributions to enhancing quality of care and patient safety.

In the PD approach, contributions of the positive deviants are collectively mobilized as well as amplified. Thus, norm across the organization begins to shift as more people discover these positive deviants among them (social proof) and learn how they practice safety.

PD approach is now being applied diversely to address issues like diabetes control, end of life diagnosis, medication reconciliation, HIV/AIDS prevention, malnutrition, childhood anemia, the eradication of female genital mutilation, curbing the trafficking of girls, increasing school retention rates, and promoting higher levels of condom use among commercial sex workers.

Thus, the concept of “NC” can be used to understand the profile of the people whose behavior we intend to change for improving their health.

The disadvantage of the classical DOI approach is excessive dependence on specialist-driven, top-down approaches to address local problems and deliberately ignoring/rejecting simple local solutions. Slowly, over a period of time, the picture has been changed. Now DOI experts are increasingly believing and giving weightage to local proficiency and perception for finding solutions to community problems which are culturally appropriate.

In the PD approach, local solutions are easy to diffuse in the local community. When adopters are forced or imposed to adopt
a certain behavior by an outside expert, they tend to resist it. In general, it has also been seen that, in general, people are status quoists. They resist change, because it disturbs their comfort zone of what they have been used to.

The PD approach challenges the conventional method of DOI because wisdom to solve the problem lies within the community. It is opposite of DOI approach, social change experts usually make a community diagnosis to identify their uncommon yet effective practices, help them to find the positive deviants, identify gaps, and then employ external solutions to alter them by designing an appropriate community intervention to convert them into tangible actions.

In the PD approach, internal change agents (common people) should lead, without any access to extraordinary caliber or excessive resources. They represent homogeneous characteristics of their groups and obey the group norms. Then the consensus can be easily formulated within the groups that “If they can do it, others can too.” If the PD behaviors are already in practice in a community, the solutions or interventions can be implemented very quickly and without access to external resources. This is the Unique Selling Proposition (USP) of this approach. Furthermore, the benefits become more sustainable, as the solution resides locally.\[10,14,20\]

**Table 2: Comparison of Positive Deviance and Diffusion of Innovations theory approaches**

| Diffusion of Innovations theory | Positive Deviance theory |
|--------------------------------|--------------------------|
| Solutions are outside the community | Solutions are present within the community |
| Leader imposed solutions | Community self-discovers solutions |
| Community ownership absent | Community ownership present |
| Change agents works as an advisory capacity | Change agents listen and facilitate |
| Identifying gaps are the main goal | Identifying and amplifying assets are the main goals |
| Moves from problem-solving to solution identification | Moves from solution-identification to problem-solving |
| Adopters are influenced | Adopters learn by doing |
| Highlights the charismatic opinion of the leaders | Emphasis given upon behaviors of ordinary people |
| Implementation takes times | It can be implemented in no time as the solution resides in the community |
| Needs substantial resources | Needs limited resources |

**Conflicts of interest**

There are no conflicts of interest.

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