Original Article

Understanding Precautionary Behaviors among Neighbors of COVID-19-Positive Patients Using Health Belief Model: An Analysis from Available Evidence

Nilanjana Ghosh, Sudip Bhattacharya[1], Tulshi Pramanik[2], Indranil Chakrabarti[3]

Department of Community Medicine and [3]Pathology, North Bengal Medical College, Siliguri, West Bengal, [1]Department of Community Medicine, Himalayan Institute of Medical Sciences, Dehradun, Uttarakhand, [2]Deputy II CMOH, Darjeeling District, West Bengal, India

Abstract

Background: COVID 19 pandemic is a unique public health challenge affecting millions globally. Asymptomatic carriers are a primary concern. Prevention is the only cure. Interruption of transmission dynamics is identified and accepted as a key containment strategy to prevent community spread. Risk perceptions influence precautionary behaviors which subsequently affect adherence to lockdown and home quarantines. The presence of positive patients in locality creates panic as many contacts have to undergo testing and quarantines/isolations. **Objectives:** The present study assesses the perception of close contacts in the neighborhood applying the health behavior model after one of their neighbors tested positive. **Materials and Methods:** A mixed-method month long study was conducted among close contacts of a proven positive case. Data were elicited using online questionnaires after necessary consent and permission and analyzed accordingly. **Results:** The perceived stress and susceptibility were high. Risk perception was high, and health care workers were considered a potential threat to the community. Similar studies have been compared. The residential complex was declared a containment zone. **Conclusion:** Researchers concluded risk perceptions as high and emphasized the need for pandemic preparedness. A larger study is recommended.

Keywords: Community experiences, health behavior model, precautionary behaviour, risk perception

Introduction

The coronavirus pandemic has spread worldwide. However, preventive aspects were not initially emphasized since the World Health Organization had initially dismissed the use of masks and cited an animal to human transmission only to refute the theory later. Human-to-human transmission was established as the main cause, and masks became a mandatory part of social existence.[1] Lockdown, masks, hand hygiene, sanitization, cough etiquettes, special protective gears for health-care workers, testing, contact tracing, awareness generation, isolation, quarantine became household terms overnight, and the whole world witnessed empty roads, shut market places, closed schools, jeopardized economies, and curtailed movements for months. Since everyday life had come to a screeching halt, interrupting transmission dynamics was the only key to preventing and treating the disease. Moreover, as various studies noted people's beliefs control infectious disease perceptions, it became essential to have an insight into it so that a sustaining preventive behavior model can be formulated.

The classical health belief model considers risk perception as one of the key influencers of health behavior,[2,3] though its extent and severity varies. Awareness and anticipated benefits of isolation, quarantine needs to be spread more, especially in remote hilly terrains of Darjeeling district. The regular tourism being hit, they are prone to disown the preventive models unless anticipated benefits and associated risks of not adhering to them are clarified. Ignorance and social media

Access this article online

Quick Response Code:

Website: www.medjbabylon.org

DOI: 10.4103/MJBL.MJBL_45_20

Address for correspondence: Dr. Indranil Chakrabarti, Department of Pathology, North Bengal Medical College, Sushrutanagar, Darjeeling - 734 012, West Bengal, India. E-mail: drinch@rediffmail.com

Submitted: 18-Jul-2020 **Accepted:** 30-Jul-2020
Published Online: 16-Sep-2020

How to cite this article: Ghosh N, Bhattacharya S, Pramanik T, Chakrabarti I. Understanding precautionary behaviors among neighbors of COVID-19-positive patients using health belief model: An analysis from available evidence. Med J Babylon 2020;17:278-81.

have unfortunately contributed to fear and panic among the residents and have wrongly implicated health-care workers as potential threats of infection in the ongoing pandemic. However, notwithstanding the limitations, appropriate precautionary behaviors are undertaken by the majority of citizens. However, since people act only when convinced and not by law enforcement, assessment of precautionary behaviors according to six components of the health behavior model (HBM) was attempted to understand their attitude and perceptions. Hence, the study was conducted to assess the perception of close contacts in earlier months of the pandemic when one of them tested positive. It will also aid to enlighten researchers on anticipated preventive behavioral outcomes in similar settings.

Materials and Methods

Study design

A study was conducted among study participants to assess their risk perception, precautionary behavior, vaccination intent, along with understanding extent of behaviors adhering/conforming to the Health Belief Model. A month-long study in April was conducted among neighbors of two health-care workers working in a tertiary medical college and hospital, who tested positive for COVID. They stayed in a residential complex near to the college. All study participants were flat owners of the complex, willing to opine and healthy. The study was conducted by a detailed telephonic interview using predesigned, pretested semi-structured questionnaires that had identified broad themes. In addition, a soft copy was sent by E-mail to each study participant, and their responses recorded. Ethical clearance was sought. Voluntary verbal permission was obtained. Study participants were explained the intent and benefit of the study priory. One respondent from each of the neighboring flats responded.

Ethical clearance

Permission was taken from the Institutional Ethics Committee. Voluntary verbal consent was taken from the residents. The concerned higher district officials were intimated regarding study purpose, and due permission was taken prior. Study purpose and benefits were explained to study participants during sensitization. Anonymity and confidentiality were ensured. As ensured data were used for academic purposes only.

Results

Twenty observations were noted. The majority were males, literate, employed, and flat owners residing in the complex for over 5 years and had known the two affected families for more than 2 years.

They stated that strict quarantine was enforced in the complex and guard was given strict entry-exit rules since lockdown was declared. The society committee regularly sanitized the complex and wearing masks were mandatory. No external vehicles were allowed to commute inside and all cafeteria and shops were closed. Even domestic helps were not allowed inside the campus. Moreover, residents had been urged to walk on rooftops. Community hall, playground, and Joggers Park were sealed. No community gatherings were allowed inside the campus, and everyone stayed indoors due to strict vigil. There was only one grocery shop inside the complex which was kept open for supplying essentials.

However, interviewees unanimously opined that since both affected health care workers were working in the hospital, they got affected and now were a potential threat to their neighborhood as well. Their panic made them believe they were under threat as health-care workers lived in their flat complex. It reflected a silent resentment for health-care workers.

Risk perception of residents was high as they were hearing it on national television for the past 3 months when cases were being reported from Wuhan and Italy. They felt foreign travelers posed a risk and had quarantined families who had nonresident Indians. They also urged local councilors to declare it a containment zone when their neighbor health care worker tested positive. She was even asked to vacate the complex.

Precautionary behavior was taken from their end and they maintained social distancing in every possible manner even during marketing at the local shop inside the complex. Few had stocked medicines in advance and underwent preventive health check-ups, which speaks volumes of their health-seeking behavior. Hand hygiene and cough etiquette were maintained and any severe acute respiratory illness case was immediately referred.

They did not use lift. The neighbors panicked as they treated themselves as close contacts of the tested positive health care workers and sought district health officials' support to seal off the complex totally. However, ration stock was not done as local ration shop inside stayed open, but unfortunately, the shopkeeper displayed symptoms lately and were advised for testing after admission. This led to more fear among residents and they took hydroxychloroquine tablets prophylactically. Financial rearrangements were done, cash at hand was kept, and functions and festivals were not celebrated but postponed. Restricted social media access, however, was not practised leading to mental agony and depression in few.

Assessing the extent of precautionary behaviors conforming to health belief models was prerogative to understand the extent of preventive behavior residents. The questionnaire was based on HBM, and it was found that perceived "seriousness," of the disease was very high and people even went to the extent of maintaining strict social distancing, buying masks at extraordinary prices. They felt that once infected, they will lose touch with their families forever and will lead to inevitable death. Perceived "susceptibility," was higher as the complex is situated close to a medical college campus, having many in-house doctors and nursing staff. Hence, the organizing committee was stringent in enforcing the rules and regulations. Personal susceptibility they thought was more as

health care workers lived in their same block, but comparative susceptibility was not perceived more as none of them were immunocompromised.

Perceived "benefit," was less as most of them were not convinced among residents varied. The majority felt that lockdown, complete restriction of movement, masks, and handwashing would help them prevent contracting the virus unless exposed to contacts. The risk will be less if they avoid touching fomites which are in contact with many, but if the administration does not declare it as containment zones, it is difficult to tide over the crisis. Perceived "barriers" or obstacles were high. It was felt that the opening of the grocery shop was a potential threat as many customers visited it. Moreover, the residence of health care workers in the complex also generated panic as they were thought of as sentinel points of infections. Lack of adequate knowhow on how to sanitize material objects, absence of clear cut guidelines, incongruent health communications by social media on the topic seemed very distressing and confusing. "Cue to action," was not much present at all. However, as the nursing staff tested positive and few developed runny noses, the apprehension of the disease led them to take hydroxychloroquine, seek healthcare and testing. They started following rules more strictly and avoided all possible contacts.

"Self-efficacy" was not very high initially but with looming fear and daily practice they felt confident in maintaining the norms. Masks slippage and going out for daily works was the commonest mistake, but with time, they felt confident in their personal ability to perform the said preventive measures.

Discussion

Many models exist on predicting precautionary behavior among humans. They were applied on other settings with different success rates.

COVID-19[4-10] is a new challenge posing a global threat unprecedented. It's the biggest public health threat that history will remember and its combating needs a multipronged strategy where each person has to stand for the other. Interrupting transmission is the only key. However, reckless behavior increases need for stringent law reinforcement by lawmakers and bring short-term changes by coercion. On the contrary, a deep understanding of HBM can predict and modify human behavior in accordance, a time taking but long-lasting welcome change. Good communication research is needed for the same.

HBM is a model that has been used to study behaviors related to preventing or mitigating disease as in influenza. It posits that messages will achieve optimal behavior change if they successfully target perceived barriers, benefits, self-efficacy, and threats.

Hence, perceived seriousness (how the person thinks that a disease could be serious for him), perceived susceptibility (how a person considers himself at risk to have a disease) has two components "personal susceptibility and comparative susceptibility," perceived benefit, (individual opinions of value and usefulness of new behavior in decreasing risk of developing a disease), perceived barriers (evaluation of impediments to adoption of action/behavior that person executes to protect oneself), cue to action (involves all variables that can move people to change their behavior), and self-efficacy (concerns confidence in personal ability to perform preventive measure) need to be understood.[2,3]

The brief study done by the researcher showed though risk perception was high, mostly due to proximity of the residential complex from the hospital and health-care workers residing in the campus. Nothing was manifest against the health-care workers until the nursing staff tested positive. They also took self-medication of hydroxychloroquine unprescribed in wrong doses and suffered from serious side effects. This indicates panic rather than preparedness.

Precautionary behavior was taken in all possible measures. The only shop supplying essentials was also closed down under suspicion of the shopkeeper being a COVID-19 suspect. Unnecessary gatherings under any pretext were discouraged by the administrative authorities inside the complex who had declared it a containment zone.

As personal beliefs lead to the adoption of precautionary behaviors, HBM was applied to check ground reality among close neighbors of those affected. It was reiterated that staying nearby to health-care professionals was the biggest threat to all residents. Perceived benefits were lower as although they were abiding complete lockdown yet were unsure of its positive outcome as cases were seen to be rising in social media. Lack of awareness generation on public health issues, no emergency contact number, and inadequate testing seemed to be the biggest barriers. Contact tracing seemed inadequate, as well. Moreover, congruent, coercive, collaborative health communication from senior officials of health would have developed self-efficacy among the study participants. Hence, the positive test report acted as a cue for action, and many families moved out of the complex during lockdown in search of safer abode. Findings and its ramifications reflect the need for a comprehensive health awareness session where their queries will be addressed, and fears allayed. Baffling social media bombardments should be restricted and a public health awareness session on television by experts where two-way communication is feasible may be arranged as authentic data and reports would help contain the situation much better and create favorable circumstances with desirable outcomes. Moreover, the complacency of getting tested and treated if circumstances arise gives a sense of relief.

Perceived barriers as the most powerful single predictor of preventive health behavior was noted across all studies, whereas perceived severity was the least powerful predictor. Both perceived susceptibility and perceived benefits were important predictors of protective health behavior; however, perceived susceptibility was a stronger predictor of preventive health behavior.

The health belief model was originally formulated to model the adoption of preventive health behaviors in the United States. A recent study of which investigated the influence of self-efficacy and risk perception on behavioral intentions related to the Avian/H1N1 flu pandemic showed that culture affected self-efficacy and risk perception. According to the authors, the way in which people perceive and respond to risks varied across nationalities and cultures. They found that self-efficacy and risk perception had stronger effects on behavioral intention in the American than in the Korean people.

Precautionary behavior studied in a large population-based survey of perceptions of pandemic influenza risk in eight regions suggested large numbers of persons would try to reduce their risk of acquiring pandemic influenza. Approximately 75% of respondents said that they would avoid public transportation, and similar numbers would avoid places of entertainment and restrict their shopping to the essentials. These reported actions are in agreement with those reported in similar hypothetical studies and recorded behavior in the face of an epidemic. A recent survey of public health professionals in the United States indicated that almost half would avoid work, a proportion similar to that reported by the general public in our survey. A survey of the Chinese community in the Netherlands, conducted just after the severe acute respiratory syndrome (SARS) epidemic, indicated that 84% had avoided travel to SARS-affected areas and 50% had avoided large gatherings of people (unpublished data), results that are comparable to those reported here.[1]

Mass media scholars in various contexts that mere physical proximity to electronic media or time spent with it does not guarantee any meaningful engagement with information.

Conclusion

COVID-19 situation is an unprecedented unique challenge in the face of the modern world. Risk perception among study participants is very high. On applying the HBM it was found that perceived stress and susceptibility were very high. However, self-efficacy and perceived benefits were not very high. It indicates that the close contacts of the tested positive case were panicked and thus were adhering to the lockdown. However, clarity in understanding the benefits of lockdown will require intensive awareness generation. It is recommended that to understand the constructs of HBM in influencing and adopting precautionary behavior a larger study with a more representative sample and adequate funding is required.

Acknowledgment

The study acknowledges the support of the study participants who gave their valuable time among the crisis.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Sadique MZ, Edmunds WJ, Smith RD, Meerding WJ, de Zwart O, Brug J, *et al*. Precautionary behaviour in response to perceived threat of pandemic influenza. Emerg Infect Dis 2007;13:1307-13. Available from: http://www.cdc.gov/eid/content/13/9/1307.htm. [Last accessed on 2020 Apr 10].
2. Bish A, Michie S. Demographic and attitudinal determinants of protective behaviours during a pandemic: A review. Br J Health Psychol 2010;15:797-824.
3. Briss PA, Rodewald LE, Hinman AR, Sheffer AM, Strikas RA, Bernier RR, *et al*. Review of evidence regarding interventions to improve vaccination coverage in children, adolescents, and adults. Am J Prevent Med 2000;18:97-140.
4. World Health Organization Department of Communications. Novel Coronavirus (2019-nCoV): Strategic Preparedness and Response Plan; 2019. Available from: https:/www.who.int/internal-publications-detail/updated-country-preparedness-and-response-status-for-covid-19-as-of-19-march-2020. [Last accessed on 2020 Apr 10].
5. Centers for Disease Control and Prevention. Implementation of Mitigation Strategies for Communities with Local COVID-19 Transmission; 2020. Available from: https://www.cdc.gov/coronavirus/2019-ncov/downloadds/community-mitigation-strategy.pdf. [Last accessed on 2020 Apr 10].
6. Alimohamadi Y, Taghdir M, Sepandi M. Estimate of the basic reproduction number for COVID-19: A systematic review and meta-analysis. J Prev Med Public Health 2020;53:151-7.
7. Wu Z, McGoogan JM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention [published online ahead of print, 2020 Feb 24]. JAMA. 2020;10.1001/jama.2020.2648.
8. Zhao X, Zhang B, Li P, Ma C, Gu J, Hou P, et al. Incidence, clinical characteristics and prognostic factor of patients with COVID-19: A systematic review and meta-analysis medRxiv 2020.03.17.20037572; doi: https://doi.org/10.1101/2020.03.17.2003757. Available from: https://www.medrxiv.org/content/10.1101/2020.03.17.20037572v1.full.pdf+html. [Last accessed on 2020 Apr 10].
9. Remuzzi A, Remuzzi G. COVID-19 and Italy: What next?. Lancet 2020;395:1225-8.
10. Champion VL, Skinner CS. The health belief model. Health Behav Health Educ Theory Res Pract 2008;4:45-65.