OPTIMIZING THE EFFICACY OF COVID-19 PATIENT SATISFACTION SURVEYS IN INDIA: A DELPHI-BASED VALIDATION PROCESS

Shazina SAEED[1,2], Karuna Nidhi KAUR[1], Manmohan SINGHAL[2], Mohd SHANNAWAZ[1], Farah NIAZI[1], Bhavna KUMAR[2], Aanchal Anant AWASTHI[3]

[1]Amity Institute of Public Health and Hospital Administration, Amity University, Noida, India
[2]School of Pharmaceutical & Population Health Informatics, DIT University, Mussoorie-Diversion Road, Makkawala, Dehradun, Uttarakhand, India
[3]Amity Institute of Applies Sciences, Amity University, Uttar Pradesh, India

Corresponding author: Manmohan Singhal, e-mail: manmohan.singhal@dituniversity.edu.in

Introduction. The COVID-19 pandemic in India increased healthcare costs and reduced patient satisfaction. This study aimed at designing and validating a new questionnaire to assess patient satisfaction with health care services amidst COVID-19 in India. **Material and methods.** *An e-Delphi method was employed to design as well as validate a self-report questionnaire. The questionnaire included a total of 18 close-ended questions which were to evaluate patient level satisfaction in patients with the disease. A panel of experts, including healthcare professionals, researchers, and public health specialists, approved an instrument in a series of structured rounds.* **Results.** *The questionnaire developed in the study appears to measure patient experiences during episode of hospitalization and was implemented as a pivotal instrument for policymakers or healthcare providers focusing on the most relevant aspects that should be considered, which help achieve better understanding how they can respond more effectively to meet the respective needs. Further, as the questions had been framed in a contextual manner, considering linguistic and socio-cultural parameters of Indian population, they were designed to assess region-based healthcare practices, thereby enhancing relevance to contextuality.* **Conclusions.** *This study will address an important gap in the assessment of patient satisfaction during a health care crisis, as well highlighting the use of Delphi Technique for validation and obtaining valid patient perspective data that can be used further to make policies and understand perception towards improvement is survey-based studies.*

OPTIMIZAREA EFICACITĂȚII SONDAJELOR DE SATISFACȚIE A PACIENȚILOR PRIVIND PANDEMIA DE COVID-19 ÎN INDIA – UN PROCES DE VALIDARE BAZAT PE METODA DELPHI

Introducere. Pandemia de COVID-19 din India a cauzat scumpirea serviciilor medicale și scăderea satisfacției pacienților. Acest studiu a avut ca scop elaborarea și validarea unui nou chestionar pentru evaluarea satisfacției pacienților privind serviciile medicale în contextul pandemiei COVID-19 din India. **Material și metode.** *A fost folosită metoda e-Delphi pentru a elabora și valida un chestionar de autoraportare, care a inclus în total 18 întrebări închise ce urmau să evalueze satisfacția pacienților cu această maladie. Un grup de experți, care include profesioniști din domeniul sănătății, și evaluatori din domeniul sănătății publice au ratificat instrumentul printr-o serie de runde structurate.* **Rezultate.** *Chestionarul elaborat în studiu măsoară experiențele pacienților în timpul episodului de spitalizare și a fost implementat ca instrument esențial pentru factorii de decizie sau prestatorii de servicii medicale, concentrându-se pe aspectele cele mai relevante care ar trebui luate în considerare, care ajută la o mai bună înțelegere a modului în care aceștia pot răspunde mai eficient pentru satisfacerea nevoilor respective. Mai mult, deoarece întrebările au fost încadrate într-o manieră lingvistică și socio-culturală ai populației indiene, , sporind astfel relevanța contextualității.* **Concluzii.** *Acest studiu va elucida lacunele importante în evaluarea satisfacției pacienților în timpul unei crize de îngrijire medicală, evidențiind, de asemenea, utilizarea tehnicii Delphi pentru validare și pentru a obține date valabile privind perspectiva pacientului care pot fi utilizate în continuare pentru a elabora politici și a înțelege percepția de îmbunătățire a studiilor efectuate în baza chestionarelor.*

INTRODUCTION

Patient satisfaction surveys are important to conduct for assessing the caliber of medical service. During the COVID-19 pandemic, their importance was further carried out so that one can find new insights into patient's experiences in such situations. These surveys are an important aspect of understanding and sustaining patient footfall, along with understanding the healthcare frameworks while being flexible and reasonable especially when the healthcare domain is rapidly evolving.

Organizations, such as the Agency for Healthcare Research and Quality (AHRQ) and the National Quality Forum (NQF) have demonstrated the importance of patient satisfaction assessments (1). The World Health Organization (WHO) has always highlighted the absolute importance of care quality to an optimal level and provides frameworks for its evaluation (2). Nevertheless, in recent times, during the pandemic these surveys have become even more important owing to the presence of multidimensional challenges such as resource limitations, interruptions in healthcare delivery, and the adaptation of rapidly evolving protocols. The insights thus committed from patient feedback help to do the gap analysis in these services as well as identify potential areas for enhancement. Moreover, the pandemic has highlighted the necessity of give personalized patient approaches, thus ensuring that healthcare approaches will be in sync with specific desires and requirements of patients (3). Surveys help to gauge the level of understanding the information they have been given, enabling any necessary changes to communication strategies. They aid in evaluating the efficacy of educational resources prepared for COVID-19 prevention, symptoms, and immunization (4).

The pandemic highlighted the critical need of psychosocial assistance for patients, irrespective of their demographic variables. Healthcare discrepancies can sometimes get worse during times of crisis. Patient – experience based surveys help to design policies that provide equitable access to healthcare resources, especially to the most vulnerable and marginalized populations. Knowing that the dynamic nature of COVID-19 demands strong and flexible adaptive healthcare systems, such surveys will help to assess how much an organization has altered to accommodate new requirements, such as the introduction of telemedi-

cine, visitation laws, and modifications to the way care is delivered (5, 6).

This study aims to address all the above concerns regarding overall patient satisfaction. However, there is a need in India to develop a validated questionnaire to assess this accurately. Current instruments may not fully capture the bottlenecks in patient care, particularly given the distinct conditions and challenges faced during the pandemic and its aftermath on the Indian healthcare sector.

Patient Satisfaction Surveys
Patient satisfaction surveys have rapidly evolved since the 1950s, when they primarily focused on basic aspects of care, such as communication and cleanliness (7). Over the recent years, these surveys have expanded its horizons to other disciplines, such as technical competence of healthcare providers, interpersonal skills, responsiveness to patient needs, and the degree of patient involvement in decision-making (8). For example, the services marketing model views healthcare as a service, emphasizing the importance of meeting patient expectations to achieve desired satisfaction (9). The expectation disconfirmation theory refutes the same (10). Other models, such as the patient-centered care framework and the Donabedian model of quality, highlight the central role of patient perceptions in evaluating healthcare quality (7, 11).

Delphi Technique
It was in the 1950's, that the goal of the Delphi technique, was created by RAND Corporation researchers. They brought together experts to reach a point of consensus on certain problems through controlled and structured communication. It was initially used on military technology forecasting, but thereafter due to its strategies like group think and the dominance of outspoken individuals, it has then been widely used in many other disciplines including healthcare (12).

The Delphi process is a systematic approach to communication that incorporates several core ideas to match a certain objective and efficient consensus-building among experts. Essentially, the method maintains participant anonymity, thus reducing the impact of peer pressure and assists them to sincere beliefs. It uses a repetitive process with many rounds of changing and improving the questionnaires, controlled feedback

methods are used to support this process. Following each round, all the experts receive summaries of the group's responses, which allows them to revisit and amend their own responses considering the larger group perspective. The Delphi method's primary component is its dependence on an expert panel (13).

Delphi proves to be a useful system for facilitating professional discussions and reaching agreements on delicate issues, gaining popularity as a reliable method in the healthcare sector. Its sustained effectiveness across various research and operational disciplines will be ensured by recognizing both its advantages and disadvantages while embracing contemporary trends.

Questionnaire Validation in Healthcare Research

Validating questionnaires for healthcare research or surveys is a meticulous process that ensures the accuracy and reliability of the data collected. During the validation process, a rigorous analysis of the instrument is conducted to ensure it accurately reflects the selected variables. A validated questionnaire is a standardized approach to collection of data, thus ascertaining that the research findings are creditable and comparable across different studies and populations (14). While evaluating construct validity, statistical methods like factor analysis are done so that one can confirm the accuracy of the questionnaire and its correlation to the theoretical constructs that it aims to measure (15). On the other hand, criterion validity examines the methods correlation with established benchmarks within the field, 'thus acting like a litmus test for its accuracy (16). Moreover, statistical measures such as Cronbach's alpha are used to determine the consistency among the items within the questionnaire, thereby acting as the internal consistency and reliability tool for the instrument (17). Through validated questionnaires, researchers can robustly capture patient-reported outcomes, adverse events, risk perceptions, and other critical data, thereby enhancing the quality and reliability of their findings. A validated questionnaire not only raises the caliber of research but also informs more precise clinical interventions and policies, grounding them in solid empirical evidence.

The e-Delphi method

The present study utilized the e-Delphi methodology to develop and validate a questionnaire aimed at evaluating Patient Satisfaction Surveys related to healthcare delivery systems during the COVID-19 pandemic in India. As part of this methodology, a cohort of experts, consisting of accomplished public health professionals, was recruited to provide critical feedback by sharing their valuable insights and knowledge to finalize the questionnaire. A unique aspect of this study is that it substitutes a single representative's opinion with the collective diversity of the group. Traditionally, the Delphi method was paper-based for gathering information from the expert cohort, but it has since been replaced by a digital alternative known as "e-Delphi methods." The digital platform enabled the maintenance of anonymity and facilitated faster response times.

The primary aim of this research was to develop a survey designed to evaluate patient satisfaction with healthcare delivery systems during the COVID-19 pandemic in India. To validate and improve the questionnaire, the study also utilized the Delphi Technique to gather a panel of experts, including researchers, public health officials, and healthcare professionals. This approach ensures that the instrument reflects the diverse perspectives and experiences relevant to the Indian healthcare landscape. To enhance its effectiveness, the questionnaire was tailored to capture the cultural and contextual nuances of the Indian population. By addressing these objectives, the study seeks to fill a critical gap in assessing patient satisfaction during the COVID-19 pandemic in India, highlighting the importance of a validated questionnaire in obtaining accurate and meaningful data for healthcare improvement.

MATERIAL AND METHODS

Design

The study followed the Delphi methodology, consisting of three rounds of expert discussions to finalize the questionnaire. Instead of the traditional method of correspondence, an online survey protocol was used for the e-Delphi method, supported by virtual meetings and email to facilitate discussions and collect data.

In this study, a 75% consensus threshold was proposed as the standard for reaching agreement. It was planned that a consensus of 75% or greater on each question would be considered acceptable for the study. The flow of the Delphi process is shown in Figure 1.
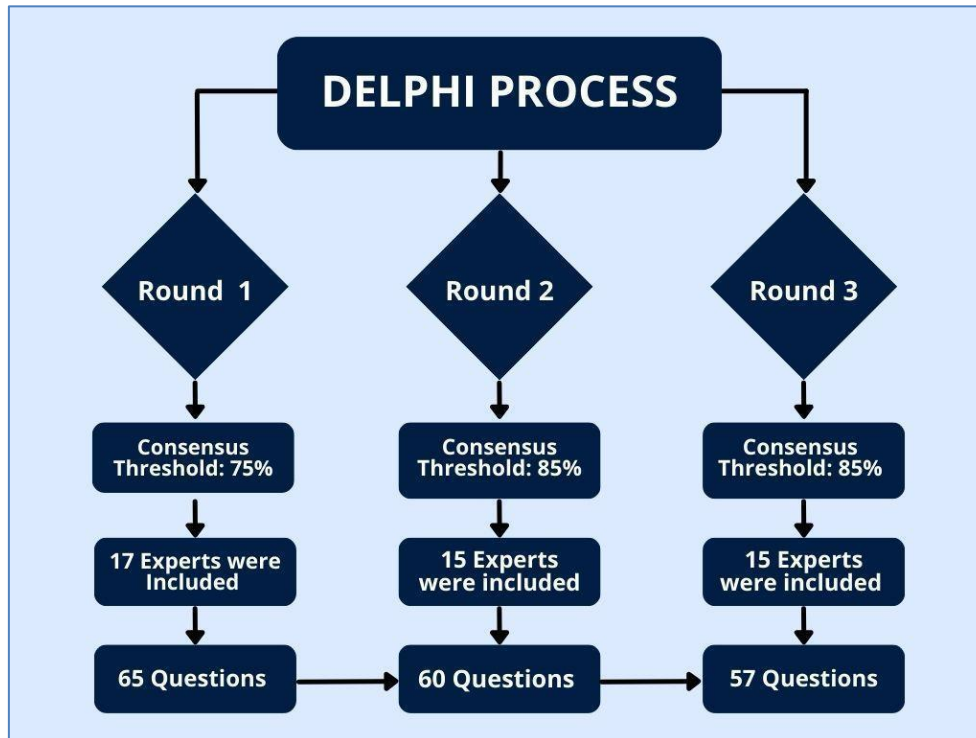
Three rounds of the Delphi process

Figure 1. The figure illustrates the progression of the Delphi process across three rounds.

Note: Each round is represented by a distinct column, showcasing the key activities and changes in thresholds.

Participants

The cohort of experts for this study was carefully selected, consisting of individuals with involvement in the Public Health field. An electronic invitation was sent to all the experts to participate in the modified e-Delphi study, which included study details and consent information. A follow-up phone call provided the opportunity to answer any further questions and offer clarifications related to the project. The participants were initially blinded to other members to encourage the expression of neutral opinions, particularly in the first round.

The criteria for selecting the expert cohort were as follows: (i) Public Health Experts with a minimum of 10 years of clinical experience in either non-communicable disease management or the healthcare sector, along with experience in conducting research related to COVID-19 and its impact on patient care and satisfaction; (ii) professionals with a background in research methodology, questionnaire development, or validation studies to ensure methodological rigor and validity; (iii) individuals who have access to an email

account; and (iv) those who are willing to participate. This diverse panel could provide an impartial reflection of current knowledge and perceptions in both the health and technology spheres.

Data collection

Three rounds of data were collected for the study, August and November of 2023 in the form of an online survey, an online group meeting and email communication. Ethical Clearance was obtained by Institutional Ethics Committee of Amity University (AUUP/IEC/2023/4).

Round 1: Introductory Research and Assessment

During the first phase of the Delphi procedure, experts were recruited in the study. The questionnaire was shared with them through the google forms to collect the survey data. The initial draft of the questionnaire had a total of 65 closed-ended questions that were designed to assess and evaluate the patient satisfaction levels among COVID-19 survivors who had been hospitalized. Structurally, the questionnaire encompassed three main sections: the socio-demographic pro-

file, details of hospital services provided with details of vaccination, and utilization of the validated satisfaction scale (PSQ-18) (5).

The preliminary questionnaire items were formulated in English and shared with each Delphi participant via email. The questionnaire was evaluated by the experts, and they provided feedback on the inclusion or exclusion of the question based on its relevance to the study. Each question was separately evaluated based on; whether the question is relevant on a dichotomous scale, whether the question was coherently worded (also on a dichotomous scale), and whether it needed rephrasing (open question). The questionnaire had an option to add comments next to each question. And propose any additional questions and make general comments.

After a four-week rigorous collection of data and follow up with the expert panel, the agreement rate was subsequently calculated for each question, along with the proportion of experts who thought that the question was relevant, worded coherently. Only after gaining 75% of the panelist's approval, were the questions included in the next round.

Round 2: Consensus-based finalization of the questionnaire

In the second round, all the approved questions from the first round were incorporated and some new questions were also included based on the expert's advice and critical feedback. After incorporating all the changes in the electronic survey forms, it was once again shared with the experts to once again allow them to assess the relevance, clarity and for changes in the verbatim of the questions. This entire process took four weeks to complete. At the end of this stage, the panelists were also asked to rate each question on a Likert scale where a score of 1- indicated irrelevance and 5 indicated relevance. The degree of agreement with each question in the final questionnaire was then evaluated, and all drafting and general remarks were compiled.

Responses rating questions as 4 or 5 on the Likert scale were defined recommendations for inclusion. The predetermined threshold for agreement was set at 85% of the panel.

Round 3: Final feedback and consensus on questionnaire

The questionnaire was further revised in round 3 and formatted as per the suggestions of the experts and then shared with all of them via email for individual reviewing. Each question was evaluated on the basis that if the question was recommended to be included in the final questionnaire, or if it required any revisions or needs to be excluded (with appropriate reasoning). Consensus was defined as 85% of the experts agreed on the final inclusion of the questions in the questionnaire. The consensus for the third round took approximately four weeks to collect and analyze.

In each Delphi round, the consensus rate of the experts on the inclusion of the questions were evaluated by calculating both the proportion and mean. Initially, a cut-off level for consensus was set at 75% in the round one. Subsequently, in round two, the experts rated their level of agreement for each question on a scale ranging from 1–5 (1 = the question can be excluded; 5=question is relevant to the questionnaire). At this round, the level of agreement threshold was set at 85%. In the third round, the agreement threshold was set at 85%.

The consensus among the experts, in conjunction with their critical feedback and suggestions for improvement, bolstered the internal and content validity of the questionnaire. A statistical software package known as SPSS was employed to conduct the statistical analysis.

RESULTS

The outcomes of the study indicate that a significant majority of the expert panel – 15 out of 17 members, representing 88.2% – recognized the necessity for a standardized patient satisfaction survey instrument specifically tailored for the assessment of healthcare services related to COVID-19. Five out of seventeen experts (29.4%) expressed that a new patient satisfaction survey questionnaire should be formulated, however a larger majority of 70.5 % suggested that question related to COVID-19 healthcare delivery can be added to the otherwise standard patient satisfaction questionnaire (PSQ-18), suggesting that certain items could be selectively incorporated as needed.

In the first round, thematic evaluation was done for the questions to be included in the survey for assessing the patient satisfaction related to healthcare delivery system among COVID-19 hospitalized survivors. The themes included the accessibility of healthcare services, clinical hazards

and resultant outcomes, caregiver cognizance, attitudes, and responsiveness towards patients afflicted with COVID-19, the socio-demographic attributes of the participants, as well as the phenomenon of vaccine hesitancy.

In the next round, the above-mentioned themes were applied, and an initial questionnaire was made after incorporating the questions identified in the initial round. In this round about 85% of the experts agreed upon the comprehensiveness of the questionnaire. However, 62% of the experts thought that the questionnaire was not feasible as it was too lengthy, in contrast to the above, over 47% among them regarded that almost every question was "important" or "essential".

In the third round of evaluation, the panel scrutinized the subsequent draft for precision and delineated a fundamental set of inquiries, encompassing sociodemographic aspects. An impressive 85% of the panel members designated all inquiries as "clear," leading to the exclusion of 8 questions from the initial pool of 65.

During the iterative Delphi rounds, the expert panel achieved a consensus on multiple critical aspects, including the significance of employing Likert scales for response measurement and the necessity of incorporating inquiries pertinent to COVID-19. In conclusion, a consensus was established on 57 distinct questions. Nonetheless, persistent discord was evident concerning the potential inclusion of focus group interviews with the younger demographic, specifically individuals aged 18 to 22 years.

The final version of the newly developed questionnaire, based on the findings from the Delphi survey, includes 57 questions related to COVID-19, healthcare provision during the pandemic, vaccination ambivalence, and sociodemographic attributes. It is methodically designed to utilize a 5-point Likert scale to quantify patient satisfaction indices, as depicted in Figure 1.

DISCUSSIONS

The development of a standardized patient satisfaction survey questionnaire tailored for COVID-19 healthcare delivery represents a significant advancement in understanding patient experiences during the pandemic. A similar strategy was adopted by Wu, Meng-San et al. in their study conducted in Liverpool, UK (18). Another study from

India (19) also evaluated patient satisfaction during the hospital stay of COVID-19 patients, but only in terms of psychometric evaluation, thus making it different from ours. Internationally, since the onset of the pandemic, several studies across the globe have been pioneers in using the Delphi process for questionnaire validation (19). However, this method has not been widely used in India. Our study utilized the e-Delphi method, which facilitated a structured and iterative process among a diverse panel of experts, including healthcare professionals, researchers, and public health officials. The consensus-driven approach ensured that the final questionnaire not only reflects the multifaceted nature of patient satisfaction but also aligns with the cultural and contextual nuances of the Indian healthcare system.

The results from the Delphi rounds indicate a strong agreement among experts regarding the necessity of a dedicated questionnaire for assessing patient satisfaction in the context of COVID-19. With 88.2% of the panel recognizing the need for such an instrument, it is evident that there is a critical gap in existing patient satisfaction measures that this study aims to fill. The identification of key themes – such as access to care, clinical risks, caregiver responsiveness, and vaccine hesitancy – highlights the unique challenges faced by patients during the pandemic and underscores the importance of capturing these dimensions in the survey. Another study from India (19) had highlighted the themes as daily need facilities, treatment and hospital appropriate facilities, thus having very different conclusions. Apart from the themes, their method of validation was purely systematic by conducting several qualitative interviews and evaluating it on a psychometric scale.

The iterative nature of the Delphi process allowed for continuous refinement of the questionnaire. In the second round, the incorporation of feedback led to a draft that over 85% of panelists agreed to include with all essential elements. However, the suggestion from nearly 62% of experts to shorten the questionnaire reflects a common challenge in survey design: balancing comprehensiveness with feasibility. The final version, consisting of 57 questions, successfully navigates this challenge by focusing on critical areas while ensuring that the instrument remains manageable for respondents. To the best of our knowledge, there is no questionnaire based on patient satisfaction re-

lated to COVID-19 which is so detailed and robust in nature. Moreover, the use of a 5-point Likert scale for quantifying each response enhances the questionnaire's ability to effectively summarize the data collected. This choice of survey design aligns with best practices in conducting surveys, allowing for nuanced responses that can inform healthcare providers about specific areas needing improvement. This is also the methodology followed by most studies (20). The emphasis on clarity and coherence in question wording, as evidenced by the elimination of 8 questions in the final round, further strengthens the validity of the instrument.

The implications of this study extend beyond the immediate context of COVID-19. By establishing a validated questionnaire, healthcare providers can gain valuable insights into patient experiences, which can inform quality improvement initiatives and policy decisions. Additionally, the findings underscore the importance of engaging diverse stakeholders in the development of healthcare assessment tools, ensuring that they are relevant and effective in addressing the needs of the population.

CONCLUSIONS

1. The questionnaire serves as an essential tool for evaluating and improving healthcare delivery to individuals, as it encapsulates the intricate experiences of patients during the COVID-19 pandemic. Opting for the e-Delphi technique, ensured the preservation of robust methodology while accurately depicting the cultural and healthcare-specific contexts of India.

2. The questionnaire has emerged as an indispensable resource for policymakers and healthcare practitioners, serving a profound understanding of patient needs. It has helped to foster resiliency within the healthcare system, thereby arming the healthcare fraternity to recognize and manage health crises in the future. Future research should focus on the implementation of this questionnaire in clinical settings and its potential impact on enhancing patient care and satisfaction.

LIMITATIONS

Despite the methodological strengths of this study, certain limitations are present. A primary concern is the relatively small size of the expert panel, which was selected based on domain expertise. This limitation may constrain the diversity of perspectives and experiences represented, potentially affecting the questionnaire's generalizability within the broader healthcare context. Furthermore, the questionnaire, developed specifically to capture patient experiences during the COVID-19 pandemic, is tailored to the circumstances of that period. Consequently, its relevance, while aligned with the context of the pandemic, may not encompass the subtleties of evolving public health scenarios or the spectrum of future patient experience.

CONFLICT OF INTERESTS

There is no conflict of interest.

ETHICAL APPROVAL

The Institutional Ethical Clearance (IEC) was obtained by Amity University, Noida, India (IEC approval number: AUUP/IEC/2023/4).

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Shazina SAEED, SCOPUS ID: 57193236455; WoS Researcher ID: ABI-1699-2020
Karuna Nidhi KAUR, SCOPUS ID: 58485537900; WoS Researcher ID: JVO-3468-2024
Manmohan SINGHAL, SCOPUS ID: 57667083200; WoS Researcher ID: C-7725-2011
Mohd. SHANNAWAZ, SCOPUS ID: 56349680200; WoS Researcher ID: AAY-3219-2020
Farah NIAZI, SCOPUS ID: 57223949830; WoS Researcher ID: AAF-9702-2020
Bhavna KUMAR, SCOPUS ID: 57209177097; WoS Researcher ID: AAY-3219-2020
Aanchal Anant AWASTHI, SCOPUS ID: 5721717429