

ORIGINAL ARTICLES

Co-design application and consideration for health technology intervention in Vietnam

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ABSTRACT

Objectives: Co-design or participatory design is an approach to design attempting to actively involve all stakeholders in the design process to help ensure the result meets their needs and is usable. Participatory design is an approach which is focused on processes and procedures of design and is not a design style. With the idea of redesigning healthcare processes from patients' perspectives, co-design in health research provides end-users an even platform with researchers in leading service design. The application of co-design in healthcare aims to address the misalignment between researchers' aims and end-users' needs, which is the main reason of research waste. The purpose of this paper was to inform available co-design approaches in health care and discuss contextual factors affecting the application of codesign in consideration of the Vietnamese health context.

Methods: The application of co-design approaches in health technology intervention was developed from the synthesis of existing literature and the comments from all stakeholders regarding the Vietnamese health context.

Discussion: Co-design has been developed long time ago, however its application in health care has started recently. The involvement of 'patient', 'stakeholder', or 'public' in designing and redesigning healthcare services is the signature of co-design approaches. While it is hard to define the most effective co-design approach to use, healthcare providers, health researchers and health policymakers should prioritise services-users' perspectives and needs as well as consider contextual factors in health care in Vietnam.

Keywords: Codesign, health technology intervention, health technology assessment, eHealth, healthcare context, Vietnam.

INTRODUCTION

Since the 1970s, the goal of the manufacturing industry has transformed from designing services for the benefits of providers (supplier-centered design) to designing products around the people and eventually to involving users, stakeholders and practitioners into the designing process that eventually have formed co-design approaches (1). In healthcare, co-design focuses more on redesigning healthcare services in considering

the service-users' (i.e., patients) perspectives and combining it with the contributions of individuals who provide the services (i.e., healthcare staff) as well as those who directly create the services in terms of technology (i.e., IT personnel) (2). With this change, patients and other end-users are able to attend stakeholder workshops, undertake surveys or participate the mapping process of creating healthcare services (3). Since the fundamental aim of healthcare services, is to enhance health



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outcomes and patient satisfaction, the unique and insightful experience from patients can be used as a feedback tool for future service improvements (4). Therefore, the inclusion of individuals on both the providing and receiving ends in designing a service would utilize the knowledge and expertise of all those involved to achieve more well-rounded health services with improved efficiency and successful outcomes.

Each year, billions of dollars have vanished due to countless healthcare researches that fail to prove any meaningful findings for the healthcare system (5). Chalmers and Glasziou (5) found that an astounding 85% of health research is wasted through projects that are poorly designed, unpublished, and inadequately reported. The key of this issue is speculated to be the limited value and relevance of the questions that these researches are attempting to address (6). This means that the process of selecting the research question has not been done with the needs of patients, clinicians, and other end-users in mind (2). Decisions made at this stage are crucial in terms that they could influence all the remaining stages of the research process. Researchers might not even be aware of how little of their findings that patients and healthcare professionals find useful. This emphasizes the importance of end-user participation in the research process, especially during the initial stage of identifying the prioritized area that would be addressed. The successful implementation of research codesign could lessen the current gap between researchers' aims and end-user needs while addressing the issue of research waste and improving research outcomes (5,6).

In the context of co-design for applied health research, one might consider the Health Technology Assessment (HTA) processes, as these have been playing an important role in terms of approving and adopting new health technologies in local contexts, and so the co-design process can consider the expectations

of its local HTA body early-on during development in order to increase the chances of successful adoption of a new technology or intervention in the long run.

To give an example from the UK perspective, HTAs have grown up together with Evidence-Based Healthcare and the need for cost savings in the context of rising customer expectations. HTAs essentially provide a mechanism for supporting the compilation and analysis of relevant research on the effectiveness and cost-effectiveness of a given health technology (7).

In the UK, cost-effectiveness will be generally relevant to cost-effectiveness for the National Health Service; in other countries it may be that cost-effectiveness decisions are made in support of private healthcare systems, individual hospitals or other settings. The HTA Programme in the UK is funded by the National Institute for Health Research (NIHR) (8), which is itself funded by the Department of Health and Social Care.

HTA programmes have also grown together with NICE (the National Institute for Health and Care Excellence) in England, Wales and Northern Ireland and share the goal of providing guidance and decision-making support for effective and cost-effective health care. While the HTA initially assessed new interventions such as mammography screening, since 1996 this scope has expanded to include, for example, the National Coordinating Centre for Health Technology Assessment—to manage priority setting, funding for studies and evaluation of results (8). It may be that, as health technologies continue to emerge and multiply, that the focus of HTAs will change somewhat from basic effectiveness analyses to comparative effectiveness analyses (9).

How might this play out in Vietnam in the near future in relation to co-design and co-

production? Firstly, for example, HTAs involved with assessing service effectiveness, cost effectiveness, and health care interventions' extensive impact (including new tests, pharmaceuticals, devices and procedures) could be contacted by co-design project leaders in order to ask how the work they produce might be evaluated before it can be approved for system-wide use. On the other hand, co-design project leaders can also influence the development and further refinement of HTAs in Vietnam by providing evidence in support of co-design and related concepts, as a way of contributing to and promoting best international practices locally.

The application of codesign approaches to health technology intervention in Vietnam can align patients' needs with the aims of researchers through end-user input in turn, will enable better healthcare services and improve health outcomes. This paper aims to: (1) Inform available co-design approaches which are currently used in healthcare; and (2) Identify contextual factors influencing the application process of codesign in health technology intervention in Vietnam.

CODESIGN IN HEALTH CARE

Co-design is a type of participatory action research, in which the active involvement of stakeholders or service/ end -users (e.g. patients, families, customers etc.) in the service design process help ensure that the outcome serves their needs and expectations (10). In health care, co-design has been used much in health technology interventions that aim to make better experiences for patients, caregivers and staff (11). Tracing back to over 15 years ago, healthcare and design found their common ground in making service experience better for users (3). That was when healthcare design was emerged with the aim to have good design of healthcare services. Healthcare

has been always associated with the use of evidence-based practice, which is considered as design pathways, and mechanism, which is related to clinical governance and care standards for patients. Recently, redesigning human experiences has been brought to the consideration as another aspect of healthcare design. The human experiences of healthcare service can be perceived as good for a poor-quality process. Reversely, a fast and efficient process can result in very poor experience that make the service is meaningless.

Co-design does not mean eliminating the traditional frameworks of designing healthcare services, but rather expanding the concept of service development along with the well-established techniques and tools in use before. Tracing back since 2005, the earliest co-design project was first used in a cancer care service at Luton & Dunstable hospital (3). Ever since then, continuing the footsteps of the first co-design project, at least 59 more projects were undertaken across various clinical settings along with an additional 17 projects planned for future implementation (12). Since the model of codesign in healthcare have been gaining traction, the role of patients has expanded from passive recipient of healthcare to active participant of the service redesigning process. However, it is not to be mistaken with the concept of 'patient-led' or 'publicly led' since the 'co' indicates a shared leadership where healthcare professionals, patients and designers all contribute to leading service design alongside each other (13). Stories and storytelling can be considered the foundation of experience design. As they serve as an archive for patient experience, they are necessary for healthcare professionals to recognize and understand what is working and what needs improvement in medical care from the patient's standpoint (14). The goal of co-design is to facilitate meaningful end-user involvement in redesigning services across various stages of

research and its approaches ranges from surface involvement to active engagement. End-users can provide useful feedback on research protocols, especially with the research planning phase and deciding which research outcomes would matter to patients.

Within the healthcare context, approaches to co-design all revolves around the involvement with at least one group of non-research end-users including 'patient', 'stakeholder', or 'public'. These approaches use different terms for description such as 'participatory research' or 'inclusive health research' but overlap substantially in scope (15). However, there were certain distinctions amongst co-design approaches regarding the target of research and the groups of end-users involved. With 'inclusive health research', the end-users involved are restricted to those who have learning disabilities. A study conducted by Drahota et. al (16) practiced the approach of 'consumer-academic partnership' which emphasized the collaboration limited to between academic researchers and end-user organizations. The level of end-user engagement might also vary between codesign approaches, ranging from 'consultation', where consumer involvement is only on surface level, to 'significant engagement', where strong partnership between researchers and end-users is maintained throughout the research process. Co-design approaches can also differ in the research stages that end-user input is needed. For example, in the 'stakeholder engagement' approach, end-users are involved in the process of results interpretation and distribution whereas in 'participatory methods research', input from stakeholders are used in the designing and conducting phases (17, 18). The lack of a standardized terminology and consistent definitions for co-design approaches can be an obstacle in understanding the relevant literature and applying the concept in various contexts.

Slattery (2) has identified a variety of activities included in research co-design processes that differ mainly in objectives, timing and participants involved. The objectives of different projects emphasize the use of co-design in different phases of the research process, whether it is the prioritization in research planning stage, the review of proposals or the input for design and outcomes of the study. Across many reviews, end-users' opinions during the identification of what outcomes would be meaningful for patients were highlighted as of significant importance in research protocols, which could help address the issue of research waste (5).

The specific types of activities carried out during co-design ranges widely from individual to group meetings using various methods. It was reported that the most common form of activities in co-design include interviews, surveys and focus groups whereas more formal and less convenient methods such as conferences or symposia were not used as frequently (19). The selection of appropriate activities for different co-design projects depends mostly on the group of target end-users, whether they are children, the elderly or the disabled (20). However, healthcare practitioners, including doctors and nurses, although identified as end-users, are not provided with any explicitly tailored activities for co-design. Despite the extensive variance in co-design activities, there was limited information to describe the specific procedures of these activities. This raises a need for better documentation of activities explaining the specifics on interview strategies, or how contradicting opinions are mediated. Few articles are able to describe the specific procedures in each stage despite claiming to have strong stakeholder engagement (17, 19, 21).

Evaluation of the effectiveness of co-design application in health research consists of

analysing the benefits towards both researchers and end-users, and co-design impact on the research process. As for the researchers, many found that the adaptation of co-design into the process produce more relevant and applicable research questions and materials (22). Furthermore, the application of co-design can help researchers build important connections with the research subjects and improve the response rates (4). From the perspective of end-users, many were satisfied that their contribution in the research process had instilled in them a sense of accomplishment and increased knowledge on their medical condition (24). Nevertheless, certain shortcomings are still present, including the additional time and resources invested in the process, failure to reach mutual understanding between end-users and researchers or having to forego research vigor for the sake of end-users' preferences (4). These findings imply that the integration of co-design into health research can serve certain benefits for both researchers and end-users but still need to address issues of time delays and increased inconvenience in the research progress as well as mediating conflicts between all sides involved.

Recommendation to involve end-users in co-design

According to Good Things Foundation (24), an effective co-design model in healthcare is constituted of three stages. The first step requires understanding and defining of users and stakeholders' needs. An important task in this step is to encourage open and honest communication from both sides, and that includes allowing people to contribute their experience and expertise fully as well as being open to new ideas and solutions. The next step 'Prototype' involves gathering all the insights from the previous stage and relevant information readily available to put together a set of recommendations that could be put into test. This step requires meticulous

sorting of ideas from user and stakeholder workshops into themes and identifying areas for improvements in the redesigning process. The recommendations also need to be quick and easy to test, taking into consideration healthcare professionals' time pressures. After this, the final stage brings the recommendations to test with a small group of people in a live situation and evaluate its outcomes. Whether the idea is worth taking forward or what is working and what still needs improvements are essential questions to be addressed in this stage. Once changes have been made and concept is proven, the revised ideas should be put into test again in a larger group until desired outcomes are achieved. Finally, data relevant to the project's goals are collected as well as case studies to be used as support for statistical evidence so that stakeholders can be well informed with the progress.

Based on a systematic review, Green et. al (15) also developed a set of specific recommendations for using experience-based codesign (EBCD), which is an approach to create healthcare services and quality improvement. The review suggested an EBCD framework including eight stages along with three main phases: 1. Setting-up; 2. Information-gathering phase; 3. Co-design phase. While in setting-up (i.e., pre-EBCD) involving only stage 1- site observations, the information-gathering phase comprises two stages focusing on gathering experiences from both service provider and users (mainly through interviews), then creating trigger film of recorded interviews to generate touchpoints or lists of what the service experience should be. Co-design phase has several planning stages, such as feedback event of service-providers and -users as well as joint workshop. The planning stages help to contextualise the ideally service experiences into feasible experiences, which will be turned into reality during the implementation stages. Some suggestions could be taken in using the EBCD approach including spending

a short time in information-gathering phase to move on with co-design phase that helps to minimize the dropout of service-provider and -users' participation. Interview method is recommended to use rather than focus groups in gathering information. The implementation of joint workshop should consider the equal in giving service experiences between service-provider and users.

Consideration for applying co-design approaches in the Vietnamese healthcare context

Advancing into the digital era, Vietnam is openly embracing technological interventions in health care. Evidently, throughout the Covid-19 pandemic, numerous technological initiatives were implemented, including the various digital health mobile applications that were developed and received positive reactions from the public. The Bluetooth-based application- BlueZone gave a new meaning to the concept of contact tracing and was widely used during the social distancing period. The usage of the application was highly encouraged by the government as a data source for identification of individuals affected and those at risk (25). According to a study by Do et. al (26), even though not many smartphone users were reported to be using health-related applications, 66.4% of those that have already used such apps described the applications as incredibly useful. This indicate a considerable potential of smart health applications in being further utilized as an intervention for improved quality of life. With the implementation of codesign into designing health applications, meeting the needs of target populations through optimizing the contents and interfaces of these apps would be feasible. Therefore, it could be said that Vietnam is currently in a good position with supportive technological environment to welcome new health-technology interventions.

However, there exists certain shortcomings that can be a barrier in the success of codesign application in Vietnamese healthcare system. First, all the interventions/models should comply with the government's policies and regulations. The research team should review the current policies and regulations not only within health sectors but also regulations on information security, ethics and other related policies in order to assure the application of the co-design successfully. In Vietnam, the policies may change steadily and this factor may be a challenge. Another challenge is the information security and the lack of ownership and leadership of the collaboration network. Good leadership of the co-design should be focused and maintained during the project.

Second, it involves limited human resources capacity and time consuming. In Vietnam, almost one-fifth of clinical nurses suffer from occupational stress and exhaustion due to the presence of the overcrowding issue in most healthcare facilities across the country (27). For this reason, implementing co-design in healthcare can be a challenging venture when the organizational environment is already burdened in terms of workload and funding. Healthcare professionals' participation in co-design projects would be extremely limited, leading to insufficient time to engage with patients within the processes of co-design. Not only healthcare workers, patient recruitment for lengthy and intensive projects could also be challenging. If this fails, co-design projects would have to rely on pre-existing batch of patients that have already been familiarized with the concept of co-design through previous projects. Although their contributions still hold certain values, the range of viewpoints that they can offer is constrained, and most likely would exclude the perspectives of unrepresentative groups such as minority, disabled or vulnerable patients.

Third, in activities involving multiple stakeholders across various professional disciplines, it is inevitable that conflicts would arise from contradicting opinions (28). However, these conflictual events can be productive if the dynamic shifts between stakeholders are managed rather than suppressed (29). For innovations to emerge from conflicts, it is important to present clearly diverged positions and negotiate perspective tensions by provoking reflections and action (30). By acknowledging the differences and setting boundaries to navigate within, stakeholders can explore the opportunities and challenges while avoiding escalated conflicts. In the collaborative environment where stakeholders stay clear of confrontations and unpleasant conflicts by pleasing the other collaborators, innovations are constrained. In contrast, in groups where power dynamics clash, overt power struggles persist. Therefore, imbalance of conflict management in either directions can impede the process of utilizing stakeholders' perspectives and expertise to produce meaningful results.

This discussive paper has some limitations. Firstly, there are not many co-design interventions/projects in Vietnam. Therefore, references are limited to discuss the pros and cons of this model in development, process and evaluation stage for health services in Vietnam. Secondly, the application of co-design requires the building of trust, the input information and the facilitation of all stakeholders. However, this paper has opened up the perspectives of both the clients and those who planned and executed co-design activities. The paper also provides some knowledge for the health training programs in Vietnam.

CONCLUSION

The application of co-design approaches in designing health services and improving quality of care is crucial. This paper discussed

how co-design has been utilised in healthcare services and health research and highlighted the most used co-design approaches as well as important suggestions in the co-design application. There is no standardised co-design approach to follow but rather to focus on both service -providers and -users' perspectives and needs as well as to take into account the contextual factors that might influence the co-design process.

REFERENCES

1. Sanders & Stappers. Co-creation and the new landscapes of design. *CoDesign*. 2008; 4(1): 5-18.
2. Slattery P, Saeri A. K, Bragge P. Research co-design in health: a rapid overview of reviews. 2020; 18(17): 1-13.
3. Bate S. P, & Robert G. Experience-based design: From redesigning the system around the patient to co-designing services with the patient. *Quality and Safety in Health Care*. 2006; 15: 307-310
4. Brett J, Staniszewska S, Mockford C, Herron-Marx S, Hughes J, Tysall C, Suleman R. Mapping the impact of patient and public involvement on health and social care research: a systematic review. *Heath Expect*. 2014; 17: 637-50.
5. Glasziou P, Chalmers I. Research waste is still a scandal. *British Medical Journal*. 2018; 363: k4645
6. Ioannidis J, P, A. Why most clinical research is not useful. *PLOS Medicine*. 2016; 13(6): e1002049
7. Stevens A, Milne R, Burls A. Health technology assessment: history and demand. *Journal of Public Health Medicine*. 2003;25(2):98-101.
8. Health Technology Assessment [Internet]. [cited 2022 Feb 25]. Available from: <https://www.nihr.ac.uk/explore-nihr/funding-programmes/health-technology-assessment.htm>
9. Banta D, Jonsson E. History of HTA: Introduction. *Int J Technol Assess Health Care*. 2009; 25 Suppl 1:1-6.
10. Lee J.J., Jaatinen M, Salmi A, Mattelmäki T, Smeds R, & Holopainen M. Design choices framework for co-creation projects. *International Journal of Design*. 2018, 12(2).
11. Robert G. Participatory action research: using experience-based co-design to improve

- the quality of healthcare services. In editor. Understanding and using experiences of health and illness. Oxford University Press; 2013.
12. Donetto S, Pierri P, Tsianakas V & Robert G. Experience-based co-design and healthcare improvement: Realizing participatory design in the public sector. *The Design Journal*. 2015, 18(2): 227-248
 13. Esmail L, Moore E, Rein A. Evaluating patient and stakeholder engagement in research: moving from theory to practice. *J Comp Eff Res*. 2015, 4: 133-145
 14. Borgstrom E, Barclay S. Experience-based design, co-design and experience-based co-design in palliative and end-of-life care. *BMJ Support Palliative Care*. 2019; 9.
 15. Green T, Bonner A, Teleni L, Bradford N, Purtell L, Douglas C, Yates P, MacAndrew M, Dao H Y, Chan R J. Use and reporting of experience-based codesign studies in the healthcare setting: a systematic review. *BMJ Qual Saf*. 2019; 0: 1-13
 16. Drahota A, Meza RD, Brikho B, Naaf M, Estabillo JA, Gomez ED, Vejnoska SF, Dufek S, Stahmer AC, Aarons GA. Community-Academic Partnerships: A Systematic Review of the State of the Literature and Recommendations for Future Research. *The Milbank Quarterly*. 2016 Mar;94(1):163-214. doi: 10.1111/1468-0009.12184. PMID: 26994713.
 17. Camden C, Wilson B, Kirby A, Sugden D, Missiuna C. Best practice principles for management of children with developmental coordination disorder (DCD): results of a scoping review. *Child Care Health Dev*. 2015; 41(1):147-59. doi: 10.1111/cch.12128.
 18. Haijes, H., van Thiel, G. Participatory methods in pediatric participatory research: a systematic review. *Pediatr Res*. 2016; 79, 676–683. <https://doi.org/10.1038/pr.2015.279>
 19. Verbiest MEA, Corrigan C, Dalhousie S, Firestone R, Funaki T, Goodwin D, Grey J, Henry A, Humphrey G, Jull A, Vano M, Pekepo C, Morenga LT, Whittaker R, Mhurchu CN. Using codesign to develop a culturally tailored, behavior change mHealth intervention for indigenous and other priority communities: A case study in New Zealand. *Transl Behav Med*. 2019; 9(4):720-736
 20. Kaulio MA. Customer, consumer and user involvement in product development: A framework and a review of selected methods. *Total Quality Management*. 1998;9(1):141-9.
 21. Bird, M., McGillion, M., Chambers, E.M. *et al.* *A generative co-design framework for healthcare innovation: development and application of an end-user engagement framework*. *Res Involv Engagem*. 2021; 7(12). <https://doi.org/10.1186/s40900-021-00252-7>
 22. Boyd H, McKernon S, Mullin B, Old A. Improving healthcare through the use of co-design. *N Z Med J*. 2012;125(1357):76-87.
 23. Minkler M, Fadem P, Perry M, Blum K, Moore L, Rogers J. Ethical dilemmas in participatory action research: a case study from the disability community. *Health Education & Behavior*. 2002; 29: 14– 29.
 24. Stone E, Nuckley P, Shapiro R. Digital Inclusion in Health and Care: Lessons learned from the NHS Widening Digital Participation Programme (2017-2020). Good Things Foundation. 2020. [Internet]. [cited 2022 June 30]. Available from: <https://www.goodthingsfoundation.org/wp-content/uploads/2021/04/DigitalInclusioninHealthandCare-LessonslearnedfromtheNHSWideningDigitalParticipationProgramme2017-2020.pdf>
 25. Nguyen V Q, Cao DA, Nghiem SH. Spread of COVID-19 and policy responses in Vietnam: An overview. *International Journal of Infectious Diseases*. 2021; 103:157-61.
 26. Do, T.T.T., Le, M.D., Van Nguyen, T. et al. Receptiveness and preferences of health-related smartphone applications among Vietnamese youth and young adults. *BMC Public Health*. 2018; 18(1), 764. <https://doi.org/10.1186/s12889-018-5641-0>
 27. Nguyen HTT, Kitaoka K, Sukigara M, Thai AL. Burnout Study of Clinical Nurses in Vietnam: Development of Job Burnout Model Based on Leiter and Maslach's Theory. *Asian Nursing Research*. 2018;12(1):42-9.
 28. Lee H-Y, Nguyen TT-T, Park S, Hoang VM, Kim W-H. Health Technology Assessment Development in Vietnam: A Qualitative Study of Current Progress, Barriers, Facilitators, and Future Strategies. *International Journal of Environmental Research and Public Health*. 2021;18(16):8846.
 29. Mowles CM. *Managing in Uncertainty: complexity and the paradoxes of everyday organisational life*. Pearson; 2015.
 30. Stacey R. *The Tools and Techniques of Leadership and Management: Meeting the challenge of complexity*. London: Routledge; 2012.