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ORIGINAL RESEARCH

Adopting an Integrative and Co-Design Process to Contextualize Management Capacity Building in Hospitals

Zhanming Liang[1], Hui Zhang[2]

[1]College of Business, Law and Governance, James Cook University, Townsville Campus, Townsville, Queensland, Australia; [2]School of Public Health, Sun Yat-Sen University, Guangzhou, Guangdong, People's Republic of China

Correspondence: Hui Zhang, School of Public Health, Sun Yat-sen University, No. 74, Zhongshan 2nd Road, Guangzhou, 510080, People's Republic of China, Email zhanghui3@mail.sysu.edu.cn

Introduction: Context plays a critical role in shaping how interventions are designed and implemented, and must therefore be considered prior to implementation. There is consensus that the relationship between contextual factors and intervention outcomes is best understood using qualitative and quantitative methods, the process for considering and incorporating context remains unclear. Drawing on a recently completed study focusing on building hospital management capacity, this paper describes and discusses the benefits and learning from the implementation of an integrative and co-design approach.

Methods: This sequential mixed-methods study included managers and clinicians from two district hospitals in China. Focus Group Discussions [FGD] are a critical step in guiding the adaptation of several validated tools in the local hospital context. Data collected from FGDs and online surveys provides a comprehensive understanding of the current state of hospitals.

Results: This study identified a wide range of difficulties faced by mid-level managers and clinical staff in two hospitals. While managers reported hospital-specific challenges, staff across both sites consistently cited issues such as inadequate support, lack of recognition, and lack of patient trust. Survey results also revealed low levels of psychological empowerment, job satisfaction, and perceived leadership effectiveness. Self-assessment using the MCAP tool highlighted significant competency gaps among mid-level managers, particularly in operations management and leading change.

Discussion: The use of a co-design approach broadly engaging relevant key stakeholders from the design and implementation of the project and formulation of improvement strategies is key to enabling project success and maximizing and sustaining project impact.

Keywords: focus group discussions, health managers, leaders, competency, capability, hospitals

Introduction

Roles of Context

Context affects how intervention and change processes should be designed to generate pre-determined outcomes.[1] At the same time, economic, cultural, and social factors at the system level and history, culture, specific structures, and processes at the organization level can influence how and the extent to which intervention can generate outcomes.[2–5] The relationship between contextual factors and intervention outcomes can be understood through research using either qualitative or quantitative methods. Qualitative studies such as focus groups and interviews help understand the process and interaction between contextual factors, interventions and outcomes is best understood by qualitative studies such as focus groups and interviews.[6] Hence, mixed-method studies can generate an in-depth understanding of the experiences of those affected by interventions and intervention outcomes gained from a much broader views.[7,8] For applied and action research aimed at identifying solutions to problems and formulating strategies for service improvement, the consideration of the local context prior to the finalization of intervention is critical to ensure the relevance and applicability of the proposed actions that suit the local context.[9] A qualitative approach, drawing on participants' lived experiences through

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public forums, focus groups, or interviews, is one of the most appropriate ways to develop an insightful understanding of issues.[10] Despite growing recognition of the importance of context, many improvement initiatives overlook local factors, organisational culture, and system-level dynamics. There is limited guidance on how to systematically identify, assess, and integrate contextual factors into the design phase of interventions/improvement strategies. Context is often not treated as a dynamic and evolving influence on implementation and outcomes. This can lead to misalignment between intervention strategies and the environments in which they are deployed, reducing their effectiveness and sustainability.[2,4]

Collaborative and Qualitative Approach in Intervention Design

Constructivism in qualitative research acknowledges multiple subjective realities and encourages exploration of multiple perspectives.[11] In healthcare research, the pragmatic approach focuses on practical solutions that improve health and health outcomes[12] and generate actionable knowledge to inform evidence-based interventions and policies.[7] For its success, collaboration between key stakeholders such as practitioners, researchers, and policymakers is emphasized to ensure that the suggested solutions and research outcomes are relevant, applicable, and practical. A pragmatic approach is extremely useful for adapting solutions/interventions in the local context[9] by understanding the perspectives of key stakeholders and the complex factors that may affect the outcomes of solutions/interventions. This pragmatic approach reinforces the importance of building trust between the project teams and key stakeholders (or collaborative partners) for its sustainability.[9] However, the pragmatic approach may overemphasize practical outcomes which potentially conflict with the values and priorities of key stakeholders.[7] Adopting a collaborative co-design approach creates opportunities for all key stakeholders to actively engage in project design, implementation, and evaluation processes to address concerns, solve conflicts, and develop a sense of ownership which is critical for addressing resistance and improving compliance.

Adopting a Co-Design Approach in Building Organization Management Capacity

Co-design has emerged as an effective approach in designing and implementing research that can inform the formulation of service improvement strategies and development of policies in health and community care.[13] Going beyond the commonly known participatory approach,[14] co-design is an active process of bringing key stakeholders together in partnership with each other throughout the research process. It is a powerful approach for taking local context into consideration, getting stakeholder buy in, developing ownership and ensuring the delivery of sustainable outcomes.[15–17] It also empowers the more vulnerable and those who are often left out of the consultation process to become active partners.[18,19] Typically, co-design is guided by the following principles: inclusive, participative, respectful, interactive and outcome-focused.[20] Several frameworks have been proposed in previous studies. After studying these frameworks via a systematic literature review process, Greenhalgh et al,[21] suggest the following five taxonomy for co-design framework: "power-focused, priority-setting, study-focused, report-focused, and partnership-focused—based on their primary focus and intended purpose." (p.796). Although many co-design toolkits have been developed by government and non-government agencies which are accessible online, the research co-design process and its associated benefits have not been adequately described or evaluated in detail.[13] In addition, studies on co-design vastly focus on consumers' and patients' engagement in service design and delivery, as confirmed in the scoping review conducted by Slattery et al.[13] In studies aiming at building organizational management capacity, where policymakers, managers, and clinicians are the key stakeholders, no study has yet been found that describes the use of the co-design approach.

Importance of Management Capacity Building

Hospital managers, particularly those with dual managerial and clinical roles, are instrumental in providing consistent and high-quality patient care.[22,23] International evidence has positively linked a supportive work environment and a clear vision that empowers staff retention and job satisfaction.[24–26] Globally, in both the developed and developing world over the past two decades, there has been increasing momentum and investment at both the system and organization levels in developing a competent health management workforce. Such investments can be demonstrated in the reinforcement of mandatory training for health managers, an increased number of management competency studies and relevant publications,[27] transitioning management development from an ad hoc basis to more formal efforts. For example,

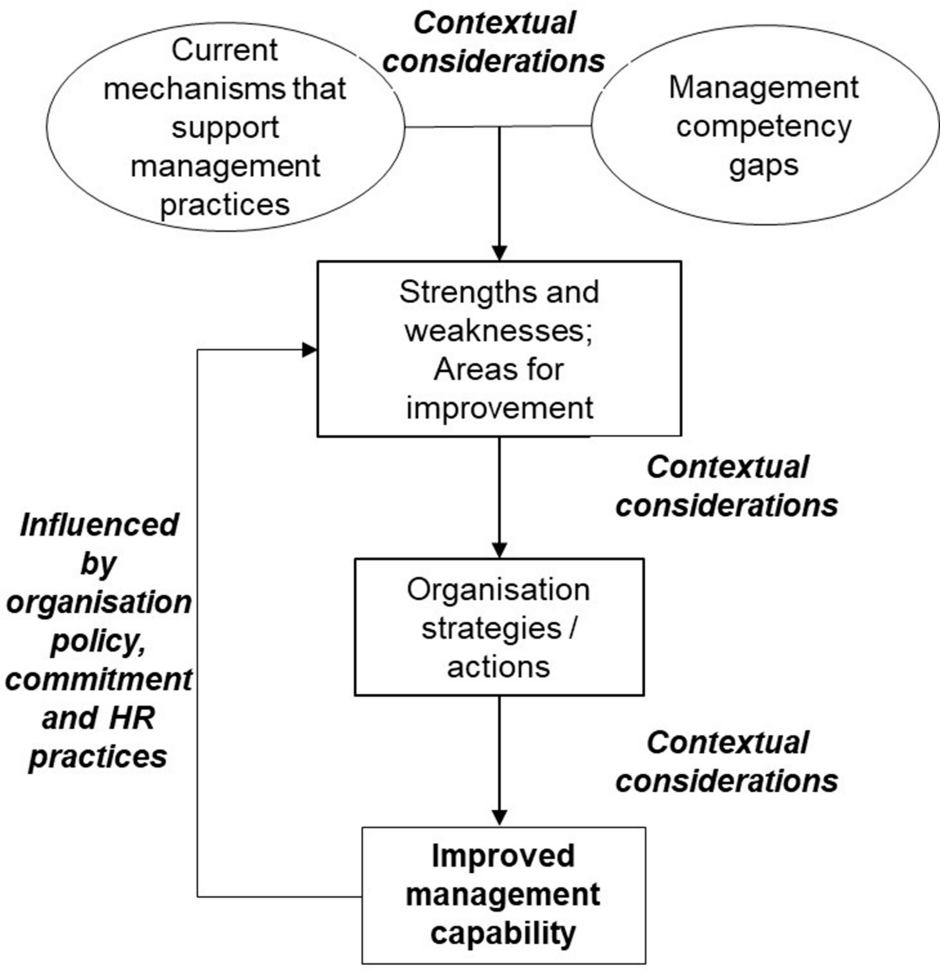

Figure 1 Contextualisation vs management capability development.

a recent desktop search in Australia confirmed that 24 postgraduate health management programs are currently being offered, with the majority of them being established no more than 20 years ago.

Despite increasing efforts, health service managers, particularly those at the mid- and lower-management levels, often lack opportunities to develop their management capability before and after taking up management roles.[28–30] This issue is more significant in countries where health management positions are generally filled by clinicians based on their clinical seniority rather than their competence and experience in managerial roles. This directly affects their confidence in their managerial role and their ability to lead both the organization and the team successfully.[31,32] At the organizational level, developing managers' capabilities and filling management positions with competent managers are core parts of human resource management policies. Creating an environment that enables managers to apply management competencies to their management roles and translate them into positive management outcomes is of utmost importance. Figure 1 illustrates how context may influence improvement efforts in management capabilities at the organisational level.

Learning from Existing Evidence on Management Capability Development

In a resource-constrained healthcare environment, learning from the experiences gained and adopting tools that have been developed in other healthcare contexts are critical to improving the effectiveness and efficiency of managing healthcare organizations and quality care provision.[33,34] In health service research, such as management competency studies, it is common and cost-effective to adopt tools and methods developed and tested in other target groups or countries.[27] A systematic scoping review of management competency studies conducted by Kakemam and Liang[27] in

both the health and non-health industries reinforced the importance of learning and "borrowing" rather than recreating the wheel to propose a framework to guide future management competency studies. They developed a framework that supports the adoption of management competencies identified in studies in various healthcare contexts. It also highlights the importance of considering the context in which managerial tasks are performed by adopting either a qualitative or mixed-method process. The management competency assessment partnership tool (MCAP Tool) originally developed and validated in the Australian health context between 2011 and 2014 has been used globally to generate new knowledge and to guide the development of the health management workforce by leading professional institutions.[27,31,32,35–37] The MCAP Tool has already been translated in Chinese language with both content validity and internal consistent being confirmed.[31,32] Hence, it has been adopted by the current study. Focus groups are commonly adopted to elicit managers' views on competency requirements and the difficulties they encounter in their roles. However, many studies failed to provide adequate details on how such studies were implemented, participants' engagement strategies, and the applicability of the research results were considered.[27]

Focus of the Paper

Using a recently completed project aimed at building hospitals' management capacity as an example, this paper describes and discusses the benefits and learning from the integration of a co-design, active engagement, and mixed-method process to ensure that the adapted tools and the developed improvement strategies have given the local context full consideration – an innovative approach in health management research. The integration process, which takes cultural, economic, social, and organization/system specifications into consideration, can guide contextual adaptation.

Contextual Background of Two Public Hospitals

To develop unified views on patient experience and staff job satisfaction in public hospitals, the Chinese Government implemented an annual National Public Hospital Patient Satisfaction Survey (NPHPSS) in 2017. The survey data from 2021 indicated that the mean satisfaction scores of both patients and staff at two local hospitals (ZXYH and RMH) located in the same District were well below the mean scores of the 496 hospitals that completed the survey in the same province. This District is one of the three regional health districts in a Level III city in Guangdong Province, China. District hospitals, ZXYH and RMH, are the only two hospitals that provide medical services to a population of 374,700 in the the District. The District Health Department identified the pressing need to address low staff job satisfaction and low patient satisfaction with care by building the management capacity of hospitals. The two authors of this paper were tasked with gathering evidence to guide strategy formulation via an active engagement approach, with broad engagement across hospitals.

Material and Methods

Guided by the principles of the co-design and qualitative research approach and the benefits of combining a quantitative approach in getting a much broader view, a sequential mixed-method study was implemented (refer to Figure 1) involving both managers and clinicians of both hospitals. The project also adopted a validated management competency development process[35] with the inclusion of a number of validated tools. Figure 2 illustrates the conceptual framework and the project flow. Table 1 provides the details of each key step in terms of purpose and participants.

Specific Consideration in the Design of the Study

The study included three primary target groups: mid-level managers, clinicians, and non-clinical staff (technicians and administrative staff). Data collected from these groups via focus group discussions (FGD) and online surveys provide a comprehensive understanding of the current state of hospitals. The two FGDs were conducted separately with mid-level managers and clinical/nonclinical staff in each hospital. All members of the primary target groups from both hospitals were invited to complete online surveys. To enhance the rigor of the study, selection and response bias and bias resulted by facilitation of focus group discussion were considered throughout the research design and implementation. All mid-level managers, clinicians, and non-clinical staff from both hospitals were invited to participate in the FGDs and online surveys. This inclusive approach would minimize selection bias. In addition, reinforcement of the voluntary nature of the study and confidentiality and

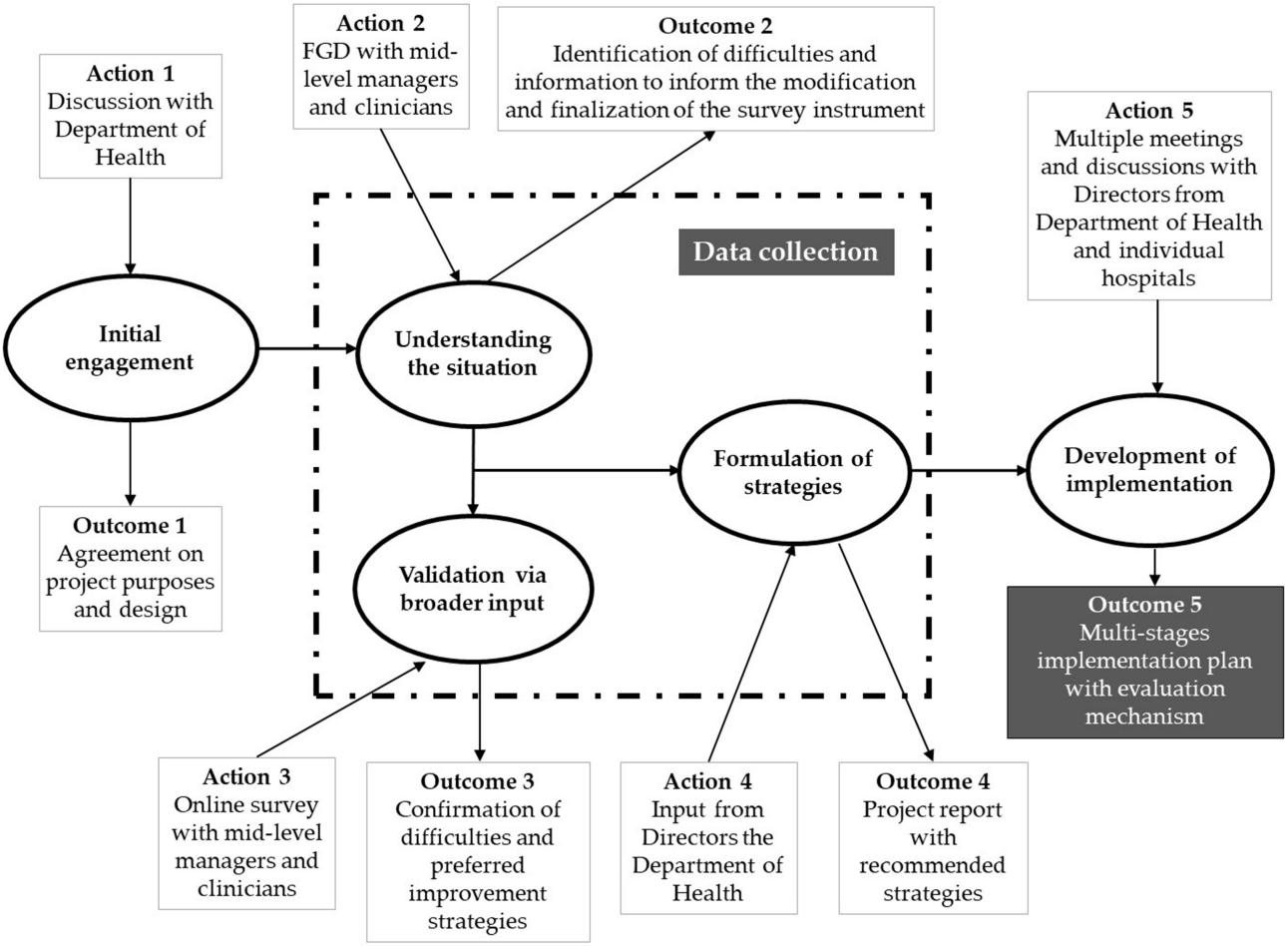

Figure 2 Multi-phase project design with associating actions and outcomes.

anonymity in both FGDs and surveys encourage responses without coercion. The use of validated instruments (eg, MCAP Tool, psychological empowerment scale) further supported the reliability of responses. In addition, FGDs were facilitated by trained and experienced members of the research team who followed a semi-structured guide to ensure consistency across sessions. Facilitators were able to maintain neutrality, avoid leading questions, and encourage open dialogue.

The key questions for the FGD and the key components of the two survey instruments are included in Table 1.

Focus group discussions not only gathered important information that contributed to the development of the two online survey instruments but also increased the momentum of change and improvement across the organization. This momentum is directly attributed to the high response rate of both the online surveys. Focus group discussions and online surveys were conducted separately at each of the hospitals which were critical for gathering information to inform the formulation of plans for individual hospitals and at the District Health level. The details are shown in Figure 2 and Table 2.

The secondary target groups were officials from the Health District and the senior executives of both hospitals. The groups primarily contributed to project design, the process of formulating strategies, and the implementation plan. The groups did not participate in either the FGDs or online surveys but were engaged in interactive discussions and meetings with the research team.

Data Analysis

Common qualitative and quantitative data analysis techniques were applied, including thematic content analysis of qualitative data collected from FGDs, open-ended questions included in online surveys, and descriptive analysis of quantitative data collected from surveys.

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Table 1 Key Focus of the FGD and Online Survey

Data Collection	Key Questions / Components
FGD with mid-level managers	**Questions** • In order to fulfil your management responsibilities at a satisfactory level, what key skills/knowledge do you need to demonstrate or apply in the role? • How did you develop the above skills and knowledge? • Are you able to fully apply the key skills in your management role? Why or why not? • Are there any other difficulties that you often encounter that made it hard for you to fulfil your management responsibilities? • In your opinion, does the hospital have the capacity to innovate? In what way/areas must the hospital make changes to develop such capacity?
FGD with clinical staff	**Questions** • What do you see in a manager who can best support and encourage you to do your job better and easier? • What made you feel or will make you feel valued by the hospital and hospital management? • What changes can the hospital make to support you to provide good quality of care to patients? • Are there any difficulties that you often encounter as a clinician in the process of providing good quality care to patients? • What can be done to help you address these difficulties? • In your opinion, in what way/areas must the hospital make changes to develop capacity in adopting innovation?
Online survey with mid-level managers	**Core components** • Demography, educational background, previous and current work experience, past and current management related training; • Difficulties commonly encountered in the management roles as identified in FGD; • Competency and associating items assessment from the validated MCAP Tool[35,36]
Online survey with non-management staff	**Core components** • Demography, educational background, previous and current work experience, past and current management related training; • Difficulties commonly encountered in the process of providing good quality care to patients as identified in FDG • Psychological empowerment[37] • High performing work systems[38] • Leadership (behaviour of supervisor)[39] • Job satisfaction[39]

Table 2 Detailed Project Steps, Purposes and Participants

Timeline	Steps	Key Steps	Purposes	Participants
May - June 2023	One	Initial consultation	Seeking input from the District Health Department in co-designing the research process	Executive Director, Director and key personnel of the District Health Department (n = 4)
Late June and early July 2023	Two	Focus group discussions	Conducting four focus group with managers and clinicians separately at each of the hospitals to understand "difficulties" commonly encountered by both managers and staff, organization level deficiencies and "expectations" on organisational level improvement	32 mid-level managers, 14 from ZXYH and 18 from RMH; 23 doctors, 13 from ZXYH and 10 from RMH; 17 nurses, 7 from ZXYH and 10 from RMH.

(*Continued*)

Table 2 (Continued).

Timeline	Steps	Key Steps	Purposes	Participants
July – August 2023	Three	Developing and pilot testing survey instrument	Developing, pilot testing and finalising the two online survey instruments for mid-level managers and clinicians informed by findings of the FGDs; Adapting the MCAP survey instrument and translating all the tested tools to confirm content validity and ease of completion. Finalisation of survey implementation strategies	Research Team; key personnel from the District Health Department (n = 2) and mid-level managers (n = 3) and clinicians (n = 6) from similar hospital
September – October 2023	Four	Conducting online surveys	Conducting online surveys	75 mid-level managers, 133 doctors, 250 nurses, 90 technicians and 63 administrative staff in both hospitals (>90% response rate)
November 2023	Five	Production of report with recommendations	Developing detailed report to the District Health with recommendations based on findings from FGDs and online surveys	Research team; Directors of the District Health Department
April 2024	Six	Formulation of strategies and implementation plan	Presenting and discussing findings and recommendations to the District Health and ZXYH and RMH Hospitals. Formulating targeted strategies and implementation plan for each of the hospitals with support from the the District Health.	Key personnel from the District Health (n = 3) and Executives Directors, 12 deputy Executive Directors, selected Mid-level managers from each of the two hospitals (n = 24)

Results

Confirmation of Difficulties via FGDs

This study generates a large amount of rich qualitative and quantitative data. The FGDs with mid-level managers identified 18 difficulties encountered in their management roles. The following five difficulties were consistent with the 13 difficulties included in the MCAP survey.

1. Team conflicts
2. Confronting higher managements level
3. High staff turnover
4. Losing high performing staff
5. Changing team skills requirements

As a result, 26 difficulties were included in an online survey of mid-level managers. FGDs with clinicians (doctors and nurses) generated 27 difficulties that were included in online surveys with both clinical and non-clinical staff.

Confirmation of Difficulties via Online Survey

Survey participants were asked to select 5 −7 difficulties that they most commonly encountered in their roles from a list of 26 and 27 items for mid-level managers and clinical/non-clinical staff, respectively. Table 3 details the six difficulties most commonly encountered by the participants which were selected by more than 30% of the participants. The six difficulties most commonly encountered by mid-level managers differed vastly between the two hospitals. However, five of the six difficulties most commonly encountered by the non-management staff at the two hospitals were the same.

Table 3 Difficulties Commonly Encountered

Participants	Hospital	Six Difficulties Most Commonly Encountered Participants (selected by no less than 30% participants)
Mid-level managers	ZXYH specific	• Project and service planning and evaluation • Limited training and professional development opportunities • Managing human resources including staff shortage, poor skills and lack of training; • Alignment with the organization values and ethical principles; • Lack of management skills and experience (of participants themselves) • Managing relationship with the referral hospital;
	RMH specific	• Patients' lack of trust in both doctors and the hospitals • Lack of long-term planning and strategic direction • Limited training and professional development opportunities; • Poor infrastructure, equipment and environment • Poor patient registration system • Poor relationship with subordinates
Clinical and non-clinical staff	ZXYH specific	• Lack of rewards and recognition guidelines • Inadequate support from superiors • Patients' lack of trust in both doctors and the hospitals; • Inadequate staffing and high turnover • Heavy workload (planned or unplanned) • Managing conflicts between clinicians and patients
	RMH specific	• Lack of rewards and recognition guidelines • Inadequate staffing and high turnover • Patients' lack of trust to both doctors and the hospitals; • Inadequate support from superiors • Poor infrastructure, equipment and environment • Managing conflicts between clinicians and patients

Lack of Support and Recognition from Management and Organization

The online survey with non-management staff, including doctors, nurses, technicians, and administrative staff, confirmed inadequate support and recognition from managers and the hospital as an organization. Figure 3, 4, and 5 present the proportion of non-management staff from each hospital who chose agree or strongly agree for each of the 12 psychological empowerment items, seven job satisfaction items, and 19 leadership behaviors demonstrated by mid-level managers. The details of these items are provided in Appendix 1.

The results indicate that a significant proportion of non-management staff believed that they were not given the autonomy to do their jobs (items PE 7,8,9) and that the organization did not recognize their importance to the job and the organization. Their level of job satisfaction and perceived importance to the organizations were low (items PE 10,11,12) (See Figure 3). This trend was consistent across the two hospitals.

The results indicate that a significant proportion of non-management staff was not satisfied with their jobs, with 10–15% of them contemplating leaving the hospital (see Figure 4). Below are the details of the six job-satisfaction items.

The results indicate that less than 55% of non-management staff from RMH agreed that their immediate managers (mid-level managers) demonstrated each behavioral item (see Figure 5). Nine of the 19 items were agreed upon by less than 50% of the staff. Each of these leadership items was agreed upon by a slightly higher proportion of non-management staff from ZXYH, except for item 11, where the result is similar.

Low Competency Level Amongst Mid-Level Managers

Self-assessment of core management competencies and associating behavioral items based on the MCAP assessment tool[35,36] confirmed competency gaps among mid-level managers. Figure 6 presents the mean scores for each of the six core

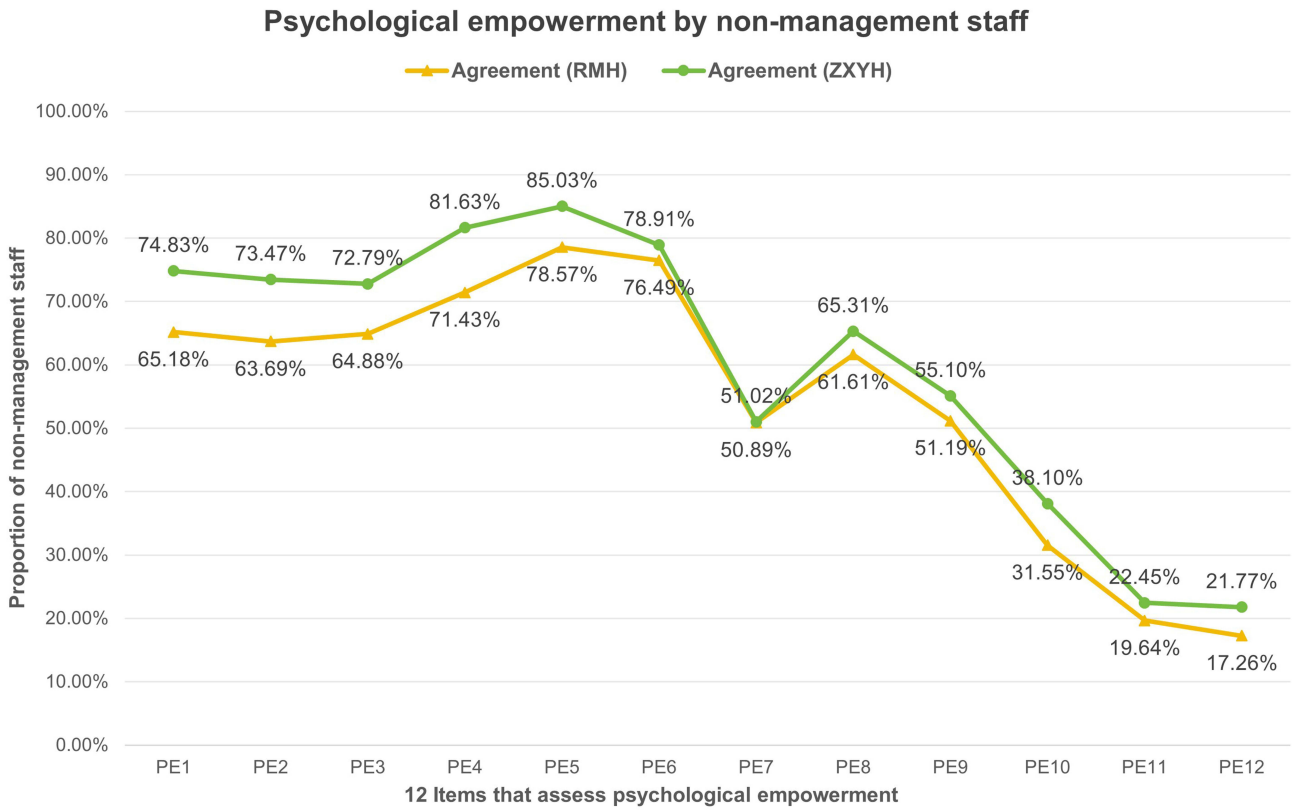

Figure 3 Psychological empowerment by non-management staff.

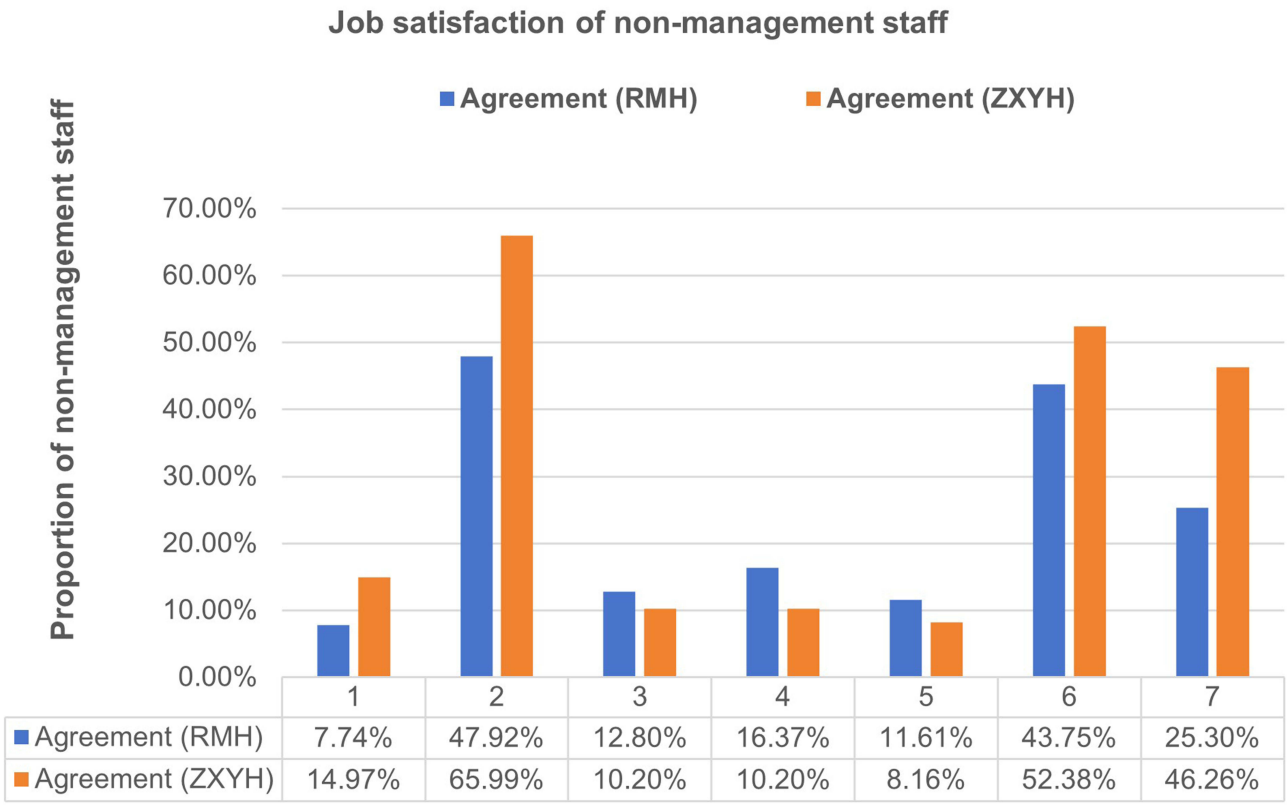

Figure 4 Job satisfaction of non-management staff.

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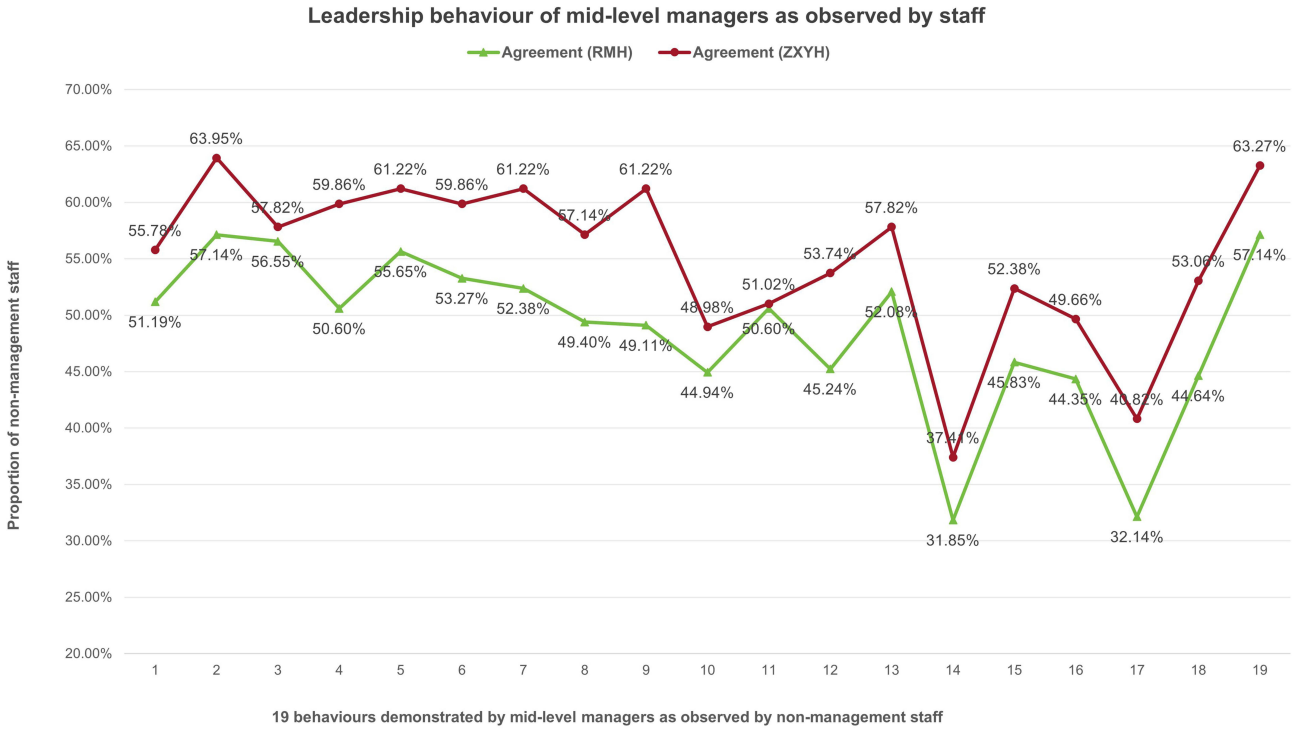

Figure 5 Leadership behaviour of mid-level managers as observed by staff.

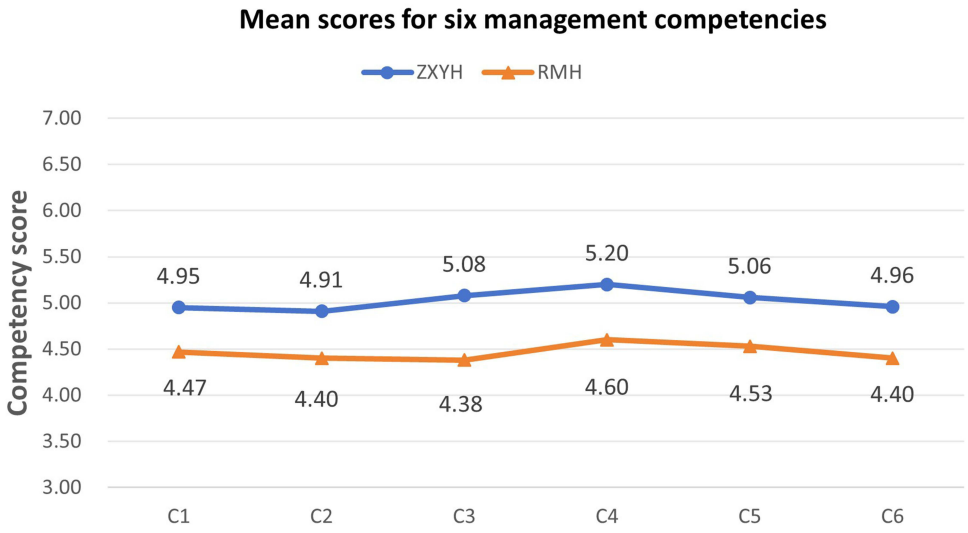

Figure 6 Mean scores for six management competency.

management competencies from each hospital and shows the variation in the mean scores received. Competency 4 – "Interpersonal, communication qualities and relationship management" received the highest mean score of 4.60 and 5.20 for RMH and ZXYH, respectively. Competency 2 – "Operations, administration and resource management" and competency 6 – "Leading and managing change" received the lowest meant score from both hospitals. In addition, the mean scores received for each of the competencies for mid-level managers from ZXYH were all 0.5, which was higher than the mean scores from RMH. Details of the MCAP competencies and 13 behavioral items are included in Appendix 1.

In the MCAP tool, each of the six core management competencies is assessed using a number of behavioral items. Figure 7 shows the mean scores for each of the 13 behavioral items for assessing competency 5 – 'Leading people and

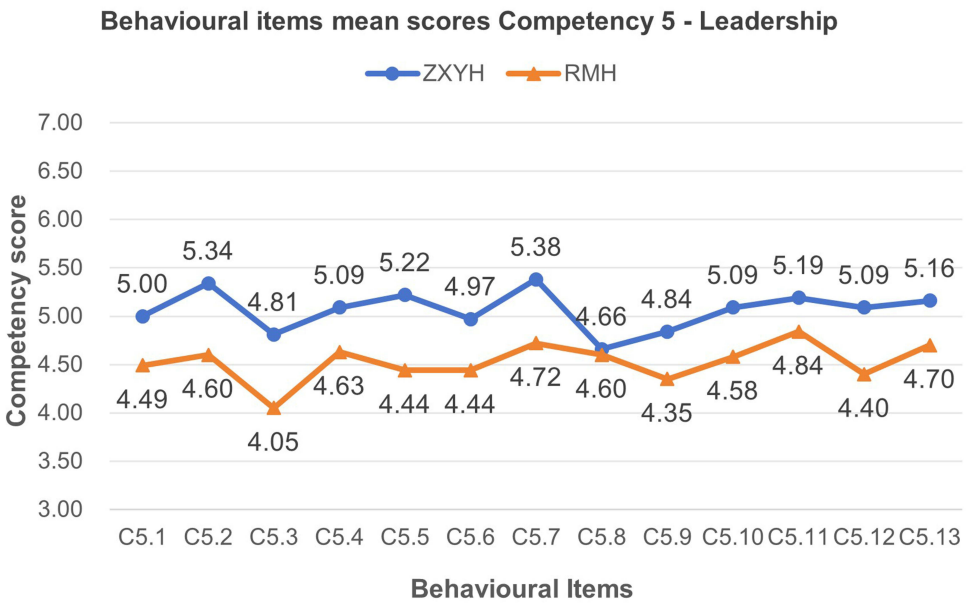

Figure 7 Behavioural items mean scores Competency 5 – Leadership.

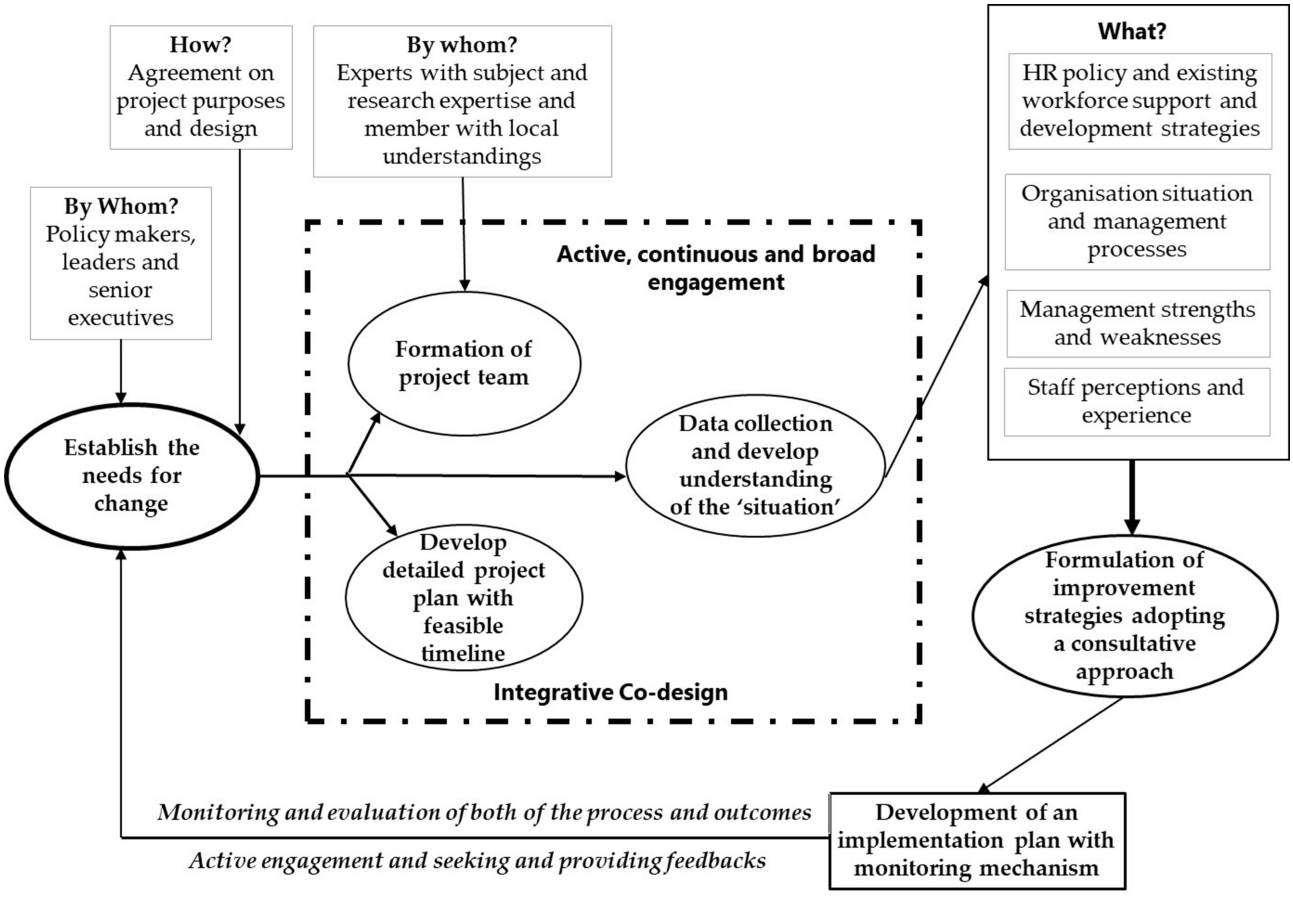

Figure 8 An integrative co-design framework for management capacity building in organizations.

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organizations received from mid-level managers from each hospital to demonstrate how strengths and weaknesses within each competency are identified. It clearly shows the variation in mean scores across the 13 behavioral items and consistently higher scores for ZXYH.

Discussion

This study reinforces the theoretical proposition that context affects the design and implementation of strategies that enhance management capability[1,40] and demonstrates the benefits of adopting validated tools such as the MCAP Tool[35,36] can be adapted through co-design to suit local organisational contexts. The findings contribute to the growing body of literature on contextualized competency development and organization capacity building. The study also advances the understanding of co-design as a strategic mechanism in organisational development, aligning with participatory design theories.[13,15,17,20]

Value of the Integrative and Co-Design Approach

Using a six-step integrative and co-design approach, the project successfully collected contextually sensitive evidence from two hospitals to guide the formulation of strategies for building hospital management capacity. In support of the concept of "management is context sensitive".[1,40] The project adopted internationally validated tools after testing content validity and actively engaging staff members across two hospitals during the data collection process. The project obtained information not only relevant to guiding individual hospitals to plan for their future actions, but also important to the District Health Department for developing actions in building hospitals' capacity to provide quality health services collectively to the population in the district.

Using a mixed-method design to generate evidence that can guide strategy formulation in practice, improvement is not new in the healthcare context. However, the conceptual considerations and actual learning of using research to develop an improvement strategy via a co-design and qualitative process have not received adequate attention. The qualitative method, which is well recognized for its ability to understand the real-world context and dipping into actual experiences and thoughts of people whose opinions count,[10,41] is also proven by the study as being powerful in guiding strategy formulation in building organizational management capacity and improving management practices and informs the adaptation of validating research tools in the local context. Additionally, creating an environment that encourages new ideas collaboratively has proven extremely beneficial for conducting robust research and development plans. Engaging end-users and decision makers as partners in 'idea creation by taking on the preferences and experiences of "end-users" is critical.[42] This study further demonstrates the value of utilizing existing expertise and experience to support new creation.

In addition to the active engagement and consultative approach adopted by the project aligning with the co-design principles,[20,21] the project's success is also vastly attributed to two key factors forming a very important part of learning which have implications for adaptation by future research and healthcare organizations in management capacity building:

1. Gaining high-level support from District Health and hospital executives and their understanding of the urgency for change and formulation of management capacity-building strategies using an evidence-informed process
2. Adopting change management principles, paying attention to change preparation, and motivating the momentum of change across hospitals has led to active participation in FGDs, extremely high survey response rates, and reliability of the data collected.

The Importance of Context

The study consistently identified differences between the two hospitals in terms of the competency levels of mid-level managers and the difficulties that managers encountered most often. Such consistent differences were also found in the job satisfaction of non-management staff and their perceived support and recognition of hospitals. On the other hand, studies also found that the difficulties most often encountered by non-management staff were consistent between the two hospitals. Both hospitals in the study are governed by the same District Health Department and are the only two hospitals providing healthcare services to people living in the same geographic locations; clinical staff qualifications and backgrounds and management staff's selection criteria and processes are very similar. This confirms the importance of

considering the "local context" by collecting evidence to understand organizational strengths and weaknesses when formulating improvement strategies. It also reinforces the importance of implementing a local adaptation process when learning from experiences gained from other organizations and sectors.[5,34] In health service and health management research, considering research findings and their implications in the context in which data were collected is important to maximize the impact of the research as it guides adaptation for future studies.[4] Therefore, researchers should share this understanding in publications that present research results. However, such efforts have not been common in many health management competency studies, as identified in a scoping review by.[27]

The completely different difficulties most commonly encountered by mid-level managers between the two hospitals further reinforced the role of organization context in affecting managers' management competency and performance. Such findings are consistent with studies using the MCAP tool[35,36] in assessing the management competencies of senior managers in three hospitals in another province which confirmed the variation in competency levels between different types of management positions and different categories of hospitals.[31,32]

Context and Framework discussion

The management literature has well accepted that management and management competencies are context sensitive.[1,40] However, its application in organizational development and the building of managers' capabilities is not well understood. The current study supports the notion that management tools, management improvement processes, and strategies cannot be "copied" without modification. Content validity must be considered during the local adaptation process[43,44]– a process of active engagement with key stakeholders, particularly local experts and study participants. In an organizational context, core components must be considered when formulating strategies and developing solutions.[5] Hence, strategies for building management capabilities and improving management structures and processes should be formulated that align with the organizations strengths and weaknesses.[45] Such considerations would ensure that the solutions are applicable and appropriate to the context in which such strategies and solutions may apply. The current study demonstrates a process for incorporating organisational context into consideration in developing an understanding of the current management challenges and management capacity-building strategies and in developing strategies that are specific to the two targeted hospitals with broad involvement across hospitals. The active and continuous engagement of mid-level managers, clinicians, senior hospital managers, and policymakers, who play a critical role in funding and supporting the development of both organizations, is key to success. The study piloted and tested a conceptual framework (Figure 1) that guides future evidence-based management capacity building in organizations.

Co-Design Organization Development Strategies

Co-design, a newly emerged concept, has taken "consumer participation" to a higher level with strategic importance.[13,15,17] This study has proven its value in contributing to achieving the overall project aims by keeping key stakeholders fully engaged and getting senior management to buy in. The current study integrated a number of key steps, as described by[20] in the co-design of the research process. The application of the co-design principles not only contributed to project success but also allowed the utilization of international and local expertise and adaptation of validated tools that improved project efficiency and the applicability of project findings. This study has made a significant contribution to the understanding of what co-designing management capacity building at the organisational level may look like, and the associated actions and expected outcomes. The study translated management capacity building and co-design theory into practice, allowing cross-learning. Considering the conceptual framework presented earlier and learning from the experience of the current study, the evidence-based framework (Figure 8) has the ability to guide healthcare organizations in co-designing organization improvement and management capacity building strategies.

The framework begins by establishing the need for change to set the momentum of change and forming a project team with the required expertise which may include the engagement of experts in the field. Through an active and broad engagement and integrative co-design process, the team collects relevant data to develop an understanding of the organization's policies, procedures, processes, strengths and weaknesses, and staff experience and perception. Improvement strategies are then developed with direct input from the organization's decision-makers to ensure their relevance and feasibility of implementation. By continuously monitoring the implementation of strategies and outcomes,

the extent to which strategies address needs and whether more actions are required can be determined. This cycle of change can continue if the needs have not been fully addressed.

Limitations

Although strategies have been implemented to mitigate bias, social desirability bias may have influenced self-reported competency levels and perceptions, particularly in the survey responses. Additionally, the study was conducted in only two hospitals within one single district, which may limit the generalizability of findings to other settings with different governance structures, organisational cultures, and health system configuration.

Practical Implications and Future Research

The project provides a replicable model for evidence-informed strategy formulation in hospital management capacity building. It demonstrates how engaging key stakeholders including clinical and non-clinical staff, managers, executives and health department officials in the co-design of improvement strategies can foster ownership, improve data quality, and catalyze organisational change. The high level of participation across both hospitals suggests that embedding change management principles can significantly improve the effectiveness of workforce development initiatives. These insights are applicable to other health systems, particularly those operating in resource-constrained or centralized settings, seeking to strengthen management capacity. Future research should expand the application of the co-design framework to diverse health service contexts, including rural and remote settings, to test scalability and adaptability.

Conclusion

This study reported an integrative and co-design process implemented in formulating strategies for developing the management capacity of two hospitals in a health district, a process that actively engaging policy makers, managers, and staff across hospitals and various research data collection stages. By explaining the associating actions and outcomes of each of the implementation stages and the presentation of selected results, this study confirms the important role that context plays in management functions, leadership behavior, and staff perceptions of their importance to the organization and level of support received. Learning from the integration of a co-design, active engagement, and mixed-method process, taking the organisational context into consideration, provides useful guidance for future health management research and capacity building projects. The integrative co-design framework created in this study provides step-by-step guidance for future evidence-based management capacity-building improvements in healthcare organizations.

Abbreviations

FGD, Focus Group Discussions; MCAP, Management Competency Assessment Partnership.

Ethical Approval and Consent to Participate

This study was approved by the Institutional Review Board of School of Public Health, Sun Yat-Sen University (No. 202370). All participants provided their consent to the participation of the study prior to the data collection process.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Consent for Publication

The authors received consent from study participants in publishing the results in journals.

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Disclosure

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