RESEARCH

The insights of allied health professionals transitioning from a matrix structure to a centralized profession-based structure within a public hospital setting

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Abstract

To manage the challenges associated with increasing costs and demand for healthcare, administrators often propose a re-structure of the workforce to gain more efficiencies. However, this can have detrimental impacts on professions such as allied health if the uniqueness of this workforce is not taken into consideration before, during and after re-structuring. In the dynamic setting of public hospital bed-based services, allied health is highly complex, consisting of diverse professionals (e.g., audiology, physiotherapy, occupational therapy, podiatry, pharmacy, dietetics, social work, and speech pathology), each requiring different technical expertise, training pathways, professional governance, and accountability. This case study evaluates the outcomes of a re-structure of allied health professionals working in bed-based services who transitioned from a matrix to a centralized structure of service delivery. Qualitative data were collected in a survey across three years to gain the perceptions from allied health staff about the impacts of the new structure. The results demonstrated that a centralized profession-based structure with single points of accountability was superior to a matrix structure in this context. The benefits identified included improved governance, administration efficiencies and cost-savings gained by having the budget and professional management aligned. This resulted in improved workforce planning and flexibility that delivered care to patients based on clinical priority. Further benefits included professional skills training pathways and succession planning across clinical specialties which enhanced career opportunities, all of which improved wellbeing and morale. These findings add to the sparse research pertaining to the components (structural, human and systems) to consider when incorporating allied health professionals in a proposed organizational design and the contingencies they require to operate successfully within certain contexts.

Introduction

To manage challenges associated with increasing costs and demand for healthcare, administrators have been looking for more efficient approaches in delivering quality care and enhancing performance. A common approach aimed at improving overall performance in many large organizations such as public hospitals has been to re-structure. However, past evidence has suggested that implementing structural change without due consideration of the unique requirements of health professionals such as allied health employees can have negative implications (Braithwaite et al. 2006; Law and Boyce 2003; Mickan et al. 2019). A review of allied health professionals (AHPs) working in Victoria, Australia concluded that there is no one best structural model for AHPs as they are a support workforce that connects and contributes to local priority requirements and systems (Buchan and Law 2016). Consequently, avoiding the 'one size fits all' approach is critical when an organization proposes a new structure that involves AHPs (Braithwaite et al. 2006; Law and Boyce 2003). This is the basic premise of organizational design theory which recognizes that there is not just one most suitable solution for organizing and that different

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organizations are not equally effective or efficient (Galbraith 1973; Burton and Obel 2018).

Organizational theory is defined by Jones (2013) as the *"study of how organizations function and how they affect and are affected by the environment in which they operate"* (pp. 30). The focus of organizational theory is to understand how to organize people and resources in order to achieve the organizations objectives (Greenwood and Miller 2020). Hence, in order to achieve its goals, the organization needs to focus on both structure and culture. Additionally, organizational design is about how and why various functions are chosen and puts pressure on individuals and work groups to behave in certain ways. Therefore, if the proper balance is not achieved, this can have significant impact on the organization's performance (Jones 2013).

The multi-contingency theory of organizational design developed by Burton and Obel (2004) explains this further, by relating variations in organizational design to variations in the situation of the organization (i.e., its contingencies), which they conclude should be chosen based on the particular context. Furthermore, the description of the context should be multi-dimensional, including structural components (i.e., goals, strategy, structure, and tasks), human components (i.e., leadership, work processes, and people) and coordination (i.e., control systems, decision systems, information systems, and incentive mechanisms).

In this view, organizational design is more a process than a structure that is constantly adapting and evolving and planning for contingencies that may arise (Burton and Obel 2004). Further, the design of an organization shapes the flow of information, resources, and support, which effectively determines the powerholders (Myers 1996). Allied health employees are a good example of when the power imbalance in large healthcare organizations can create perceptions of inequitable treatment and lead to workers feeling disenfranchised. Even though AHPs constitute the second largest workforce within the health industry in Australia and make a significant contribution to health improvements, this contribution remains under recognized due to much of the health policy and funding focused predominantly on medicine and nursing (Buchan and Law 2016). Subsequently, AHPs are often not visible enough on the health policy agenda and there is little evidence available regarding their cost benefit and value. Consequently, there has been a relative lack of examination of the allied health workforce and how they contribute and influence in healthcare organizations. This has resulted in organizational designs that have minimal consideration given to AHPs and the contingencies that may impact their performance and wellbeing, which has ultimately resulted in unfavorable outcomes (Boyce 2006; Robinson and Compton 1996; Turato et al. 2023).

While there is some debate on the correct definition of this workforce (Turnbull et al. 2009), according to the Allied Health Professions Australia (AHPA, 2022), they are considered as health professionals that are separate to medicine, dental and nursing and provide specialized support across a variety of health services. Typically, these include audiology, dietetics, exercise physiology, occupational therapy, pharmacy, physiotherapy, podiatry, psychology, radiography, social work, and speech pathology. They usually operate autonomously and practice in an evidence-based paradigm, using an internationally recognized body of knowledge to provide optimal patient outcomes (AHPA, 2022).

The focus of AHPs in public hospital bed-based services is to work within a multidisciplinary team that delivers a coordinated approach to patient care (AHPA, 2022). This fast-paced context requires AHPs to make rapid clinical decisions frequently and be adaptable and flexible across clinical areas when under pressure to meet clinical demands (Philip 2015). They require highly technical knowledge and skills to deliver care in this setting (e.g., social worker organizing crisis accommodation, physiotherapist managing a severe respiratory condition to avoid an admission to the intensive care unit, occupational therapist fabricating a complex hand splint following trauma surgery, pharmacist assisting the medical team with medication management and dosage for acutely unwell patients). These types of pressures distinguish a public hospital bed-based setting from a community or primary care setting, in which the client group is not in the acute stages of treatment or requiring highly technical expertise from AHPs (Philip 2015). The relatively limited evidence suggests that for AHPs to function optimally in public hospital bed-based services requires an efficient and effective organizational design that takes into consideration both the multi-faceted nature of the allied health workforce and the layers of professional and clinical governance required to manage them effectively.

Given the specific needs of AHPs working in this sector of the hospital, this case study provides distinctive insights from AHPs, to better understand their operating requirements. This is important for hospital systems to understand if they are proposing to re-structure with the aim of delivering more efficient, sustainable, and effective services. Not taking into consideration the unique requirements of AHPs to function optimally and treating them the same as nursing and medicine is likely to result in poorer outcomes and impact performance (Turato et al. 2023). One of the key differences of AHPs when compared to nursing and medicine is the need for each individual allied health professional to navigate multiple identities with respect to their profession, the overarching allied health structure and alignment, and their inter-professional teams (Porter and Wilton 2020). The diversity of AHPs, each with different technical expertise, training pathways, sectors of practice and professional governance, makes AHPs working in hospital bed-based services highly complex. Therefore,

as healthcare becomes increasingly complex, requiring seamless interdisciplinary teamwork and maximal return on investments in the health workforce, it is critical that the organizations in which AHPs work have considered the structural, human and system components of their design so that the widespread potential AHPs represent is fully realized (Australian Health Workforce Advisory Committee 2006).

In this study, the insights and experiences of hospital bed-based AHPs who were involved in a transition from a matrix to a centralized allied health structure were explored. The focus of the research was a large multi-site Australian public hospital and health service with five clinical orientated groupings (i.e., medical, surgical, women's and children's, community, and mental health). In 2017, the organization expanded to tertiary level services with the addition of a new hospital. In preparation for this, AHPs were dispersed into each of the five clinical groups under the management of a medical and nursing director. However, the matrix structure did not deliver upon the anticipated outcomes for AHPs working in the medical and surgical clinical groups with a range of unfavorable concerns reported (e.g., ambiguity, reduced workforce flexibility, increased cost, and low morale). Following consultation with key stakeholders and AHPs, a centralized allied health structure was implemented for AHPs working in the medical and surgical clinical units. To measure the outcomes, qualitative data were collected through an online survey in June 2020, 2021 and 2022 through open-ended questions and confirmatory meetings to verify generated themes.

This paper presents the findings of this iterative process and highlights the importance of implementing the 'right structure' which has the appropriate governance and support systems for AHPs working within hospital bed-based services. Further, it demonstrates the importance of healthcare administrators needing to be well informed about the complexities of AHPs before they consider embarking on structural change that incorporates AHPs in this context. This research contributes to relevant theory and practice by providing a deeper understanding of the type of structure and functions that may enhance AHPs experience of working in hospital bed-based services. Furthermore, the paper emphasizes that the unique contextual nuances of the work of AHPs are often overlooked during a re-structure, and this can have detrimental outcomes (Turato et al. 2023). Given there is limited empirical research about AHPs re-structuring in public hospital bed base services, understanding the experiences and insights of AHPs going through structural change, adds to the evidence that may enhance future structural re-organizations pertaining to this workforce and further maximize their potential and productivity in public hospital settings.

Background/theory

Organizational theory

Organizational theory has developed over three eras', with early organizational theorists classifying organizational structures as either mechanistic or organic (Anand and Daft 2007). The first era predominantly adopted mechanistic structures during the mid-1800s to the late 1970s and were designed for stable and simple organizational environments with low to moderate uncertainty. They were described as self-contained, top-down pyramids containing internal organizational processes that took in raw materials, transformed them into products which were then distributed to customers (Anand and Daft 2007). The second era included organic organizational structures and systems which were designed for unstable, complex, and changing environments, which mechanistic structures could not manage. This era gained momentum in the 1980s and extended through the mid-1990s and incorporated horizontal organic organizational designs with a flattened hierarchical, hybrid structure and cross-functional teams (Daft 2016).

A third era formed in the mid-1990s and extends to the present day, being driven by factors, such as the internet, global competition with low-cost labor; automation of supply chains and outsourcing of expertise to speed up production and delivery of products and services. During this period, structures evolved, including the functional, divisional, matrix, global geographic, modular, team-based, and virtual (Daft 2016). Given this case study focuses on the centralized divisional and matrix structures, a brief outline of each will be covered next.

The divisional structure incorporates several functional departments grouped under a division head. Each functional group in a division has its own marketing, sales, accounting, manufacturing, and production team. The advantages include, each specialty area can be more focused on the business and budget; employees understand their responsibilities; improved efficiencies of services; and easier coordination due to all the functions being accessible. The disadvantages of this structure include divisions becoming isolated and insular from one another and different systems, such as accounting, finance, and sales, may suffer from poor and infrequent communication and coordination of the organizations mission, direction, and values (Daft 2016).

The matrix structure is an organic structure aimed at responding to environmental uncertainty, complexity, and instability (Burton et al. 2015; Daft 2016). The matrix structure originated at a time in the 1960s when the United States aerospace firms contracted with the government.

Since that time, this structure has been imitated and used by other industries and companies since it provides flexibility and helps integrate decision-making in functionally organized companies. The matrix design has formal authority along two dimensions: employees report to a functional, departmental boss and simultaneously to a product or project team boss. This dual reporting has been described as one of the significant weaknesses of matrix structures due to the confusion and conflicts employees experience in reporting to two bosses. Hence, a detailed design of the decision-making process at each junction point is required for a successful matrix organization (Burton et al. 2015; Daft 2016). Further, to be successful a matrix structure requires important contingencies, such as climate, leadership, knowledge sharing, information technology and incentives that are correctly designed and aligned with one another (Burton et al. 2015). The next section will briefly outline specific allied health structural approaches and summarize the implications for the provision of care by AHPs reported in literature.

Allied health models

During the mid-1990s, AHPs were commonly incorporated into the emerging organizational structures in healthcare, with a growing body of research being published about the impacts on AHPs (Law and Boyce 2003). It is generally recognized that allied health structures can be classified into four types: (1) the traditional medical model, (2) division of allied health, (3) clinical matrix and (4) integrated decentralization model (Boyce 1991). The traditional medical model is where individual profession-based departments report to a medical director (Boyce 1991; Law and Boyce 2003). This model is common practice in many smaller hospitals in which there are small numbers of AHPs. However, the model is rare in larger hospital settings in Australia where there are high employee numbers within each profession requiring professional governance and oversight (Boyce 2006).

In the allied health division model (i.e., centralized profession-based structure), a director of allied health is a member of the executive leadership group and AHPs are centralized into one division (Boyce 2001; Law and Boyce 2003). The main advantages of this model are argued to be improved communication flow between senior management and departmental managers, and it positions allied health as having more status and a collective identity (Boyce 2001). Disadvantages purported are the concentration of power in management, competition between the professions and less identification with a whole of organization view (Boyce 2001).

In healthcare organizations implementing the matrix structure involved giving financial control to clinical units and services being organized around patients rather than providers (Braithewaite et al. 2006; Law & Boyce 2003). This resulted in dispersing individual AHPs into clinical units with a dual authority relationship between professional and operational reporting lines (Boyce 2006). Often, an allied health advisor position at the executive level is appointed to address allied health issues occurring within the clinical sub-units (Boyce 2001). In the public hospital setting, literature suggests that a matrix structure delivers multiple benefits, such as reduced hospitalization time and costs, better accessibility for patients, and improved coordination of care (Braithwaite et al. 2006; Burton et al. 2015; Callan et al. 2007; Mueller and Neads 2005). The aim of including AHPs was to encourage better collaboration and cooperation across the multidisciplinary team (Porter and Wilton 2020). However, the growing evidence available reports many negative outcomes, including operational inefficiencies, loss of professional identity, ambiguity over dual reporting lines, low morale, poor job satisfaction and negative impacts to service delivery (Braithwaite et al. 2006; Callan et al. 2007; Porter and Wilton 2020; Robinson and Compton 1996; Turato et al. 2023).

The hybrid model classified as the integrated decentralization model is a combination of the allied health division and matrix structure (Boyce 1991). In this structure, allied health budgets remain under the control of allied health; however, clear documentation of how AHPs will provide care to each of the clinic units is often required. In this model, it is suggested that collaboration brings benefits of transparent operational and strategic planning, including the ability to implement research, clinical education, individual staff development and professional specific quality clinical services (Mueller and Neads 2005). However, this model requires good relationships between key stakeholders to ensure its viability.

The allied health models described above provide a brief overview of each with some demonstrating more potential advantages for AHPs. While the insights available on the impacts of structural change on AHPs is growing there is still limited research about the impacts for AHPs going through such change. In this study, the perceptions and experiences of AHPs who have transitioned from a matrix to a centralized allied health structure within public hospital bed-based services are explored. The aims of the study being to first add to the current gap in knowledge about factors that may mitigate negative experiences of AHPs when hospital administrators are considering a re-structure in this setting. Second, what structures and/or supporting strategies are required to meet the complex needs of AHPs working in this dynamic context. Hence, this case study addresses the following research question:

RQ1: What are the insights and experiences of AHPs transitioning from a matrix to a centralized profession-based structure within public hospital bed-based services?

Research context and case background

The region in Australia in which the study took place is described as peri-urban with an estimated population of 400,000 people in 2022. It is the fifth most populated area in Queensland and has grown steadily at an average annual rate of 2.4% year-on-year since 2018. It is a center for tourism, attracting more than 3.2 million visitors each year. The economy has outpaced most other regional economies in Australia in terms of growth over the last 15 years across several key sectors including healthcare, education, finance, and professional business services (Connection Australia 2023). The case study research occurred at a multi-campus hospital and health service, with a new tertiary facility opening in 2017. This facility provides tertiary level services to the community and the clinical capability to care for highly complex inpatient and ambulatory care services. The health service is an independent statutory body governed by a Board under the Hospital and Health Boards Act 2011. The health service operates according to a service agreement which identifies the services to be provided, funding arrangements, performance indicators and targets to ensure the expected health outcomes for the community are achieved.

To prepare for this expansion, the allied health workforce (approximately 600 staff) was integrated into the broader organization's matrix structure in 2014. The organization believed this would support a multidisciplinary culture that was collaborative, reduce service gaps and improve consistency of allied health services. This in turn would involve AHPs in clinical directorate operational planning and improve the reporting of AHPs performance. The individual AHPs were assigned to one of five clinical orientated service groupings. These five groups were medical, surgical, women's and families, mental health, and community. Medical imaging and pharmacy remained as standalone groups that reported operationally and professionally to a director of those professions. Each director subsequently reported to the service director in the medical group. The new tertiary facility provided the hospital and health service with a total bed count of approximately 884 beds in 2018, which increased to 1032 beds by 2022. The staffing grew from approximately 4500 full time (FTE) equivalent employees to 6500 in 2022 with an operating budget in the 2021–22 annual report of 1.45 billion dollars.
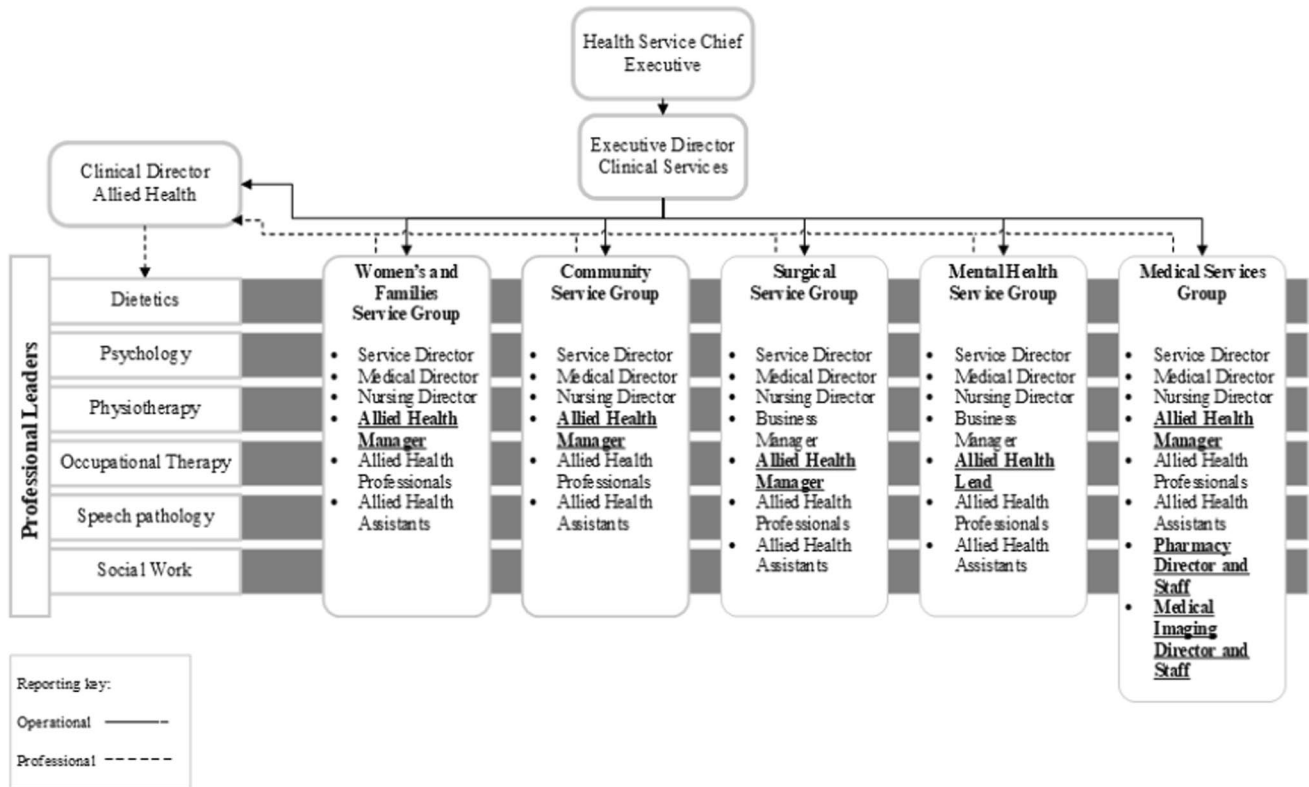

Fig. 1 Allied Health organizational chart following alignment to the matrix-oriented clinical directorate structure

A consequence of the matrix structure was that the allied health executive lead and professional director roles were abolished. Figure 1 illustrates that these roles were replaced by allied health operational manager roles for each service group that were part of the multidisciplinary service group leadership team and a clinical director of allied health role which provided overall professional leadership for allied health.

The AHPs in the matrix structure reported operationally to an allied health manager and professionally to a professional leader role (i.e., horizontal gray line in Fig. 1) that did not have operational or budgetary responsibility. This resulted in many AHPs having dual reporting responsibilities to either an allied health manager or lead for operational requirements and a professional lead for professional governance (Turato et al. 2023).

The structural change to a matrix alignment was met with a range of negative consequences particularly within the medical and surgical groups (Turato et al. 2023). Some of these included confusion over reporting lines with multiple conversations needed to resolve workforce matters. Another included increased costs and inefficiencies due to more administration (e.g., several AHPs were aggregate employees with more than one position number for each clinical unit they were working for, with some staff having up to four position numbers). The increase in position numbers multiplied the paperwork involved to manage the employee, hence increasing the cost, time, potential errors, and re-work required. This led to limited opportunities for staff rotations and career opportunities due to the administration needed to manage this. Others included limited growth in staffing levels due to the budget being owned by each clinical unit and often allied health staffing was not advocated for or understood by the clinical unit (e.g., decisions about increasing allied health FTE and in which profession often had no robust planning or reasoning). A further concern raised by AHPs was the overall voice of allied health in the organization was minimized due to the matrix structure, which resulted in AHPs reporting a perceived lower status within the organization. All these factors ultimately led to lowered morale and wellbeing being reported (i.e., public sector employee opinion survey results from 2017 to 2019).

The negative impacts reported led to a strategic decision to implement a centralized allied health structure by amalgamating AHPs in the medical and surgical groups. The posited aims of the shift back to a centralized structure included:

- Reduce patient risk through an enhanced discipline lens.
- Decrease confusion over reporting lines and improved communication.
- Decrease duplication of tasks for AHPs within each service group.

- Improve flexibility to mobilize AHPs based on clinical priority.
- Improve governance and accountability for AHPs.
- Decrease administration time and structural inefficiencies.
- Improve support to the facilities outside of the tertiary facility.
- Improve the ability to implement new models of care, innovation, and research.

The centralized allied health structure commenced in January 2020 and re-introduced what had been dismantled in 2014. The structure abolished the professional lead and allied health manager roles and created professional director roles that were responsible for both operational and professional requirements. The clinical director allied health role was re-aligned to an executive director allied health role which reported to the chief executive. Figure 2 illustrates the organizational chart for the centralized allied health structure.

Study design

This research presents qualitative data that were collected through an open-ended questionnaire using an online survey. The questions focused on why and/or how AHPs perceived the new centralized structure and was repeated annually for 3 years (i.e., 2020, 2021 and 2022). Follow-up confirmatory meetings with each profession were also conducted to confirm the themes derived from the survey feedback.

The survey asked participants to consent for their data to be used for research. Participants who did not provide consent were removed from the final research analysis. The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethics Committee of The Prince Charles Hospital, Queensland Health Human Research Committee (HREC 18/QPCH/238 on 30/08/2021).

Participants/data collection

Table 1 provides the types of professions and number of staff who consented to participate in the study. The new allied health structure incorporated hospital bed-based services within the Medical and Surgical groups with a total FTE of approximately 400 by 2022. During the planning phase of the study, staff expressed concern over being identifiable if they participated in a survey. For example, the professions with small numbers of staff (i.e., audiology, podiatry, psychology) perceived they could be identifiable if they were asked to disclose gender, age range, years in the profession / organization, level of education etc. Therefore, to encourage increased participation, demographic data were kept to
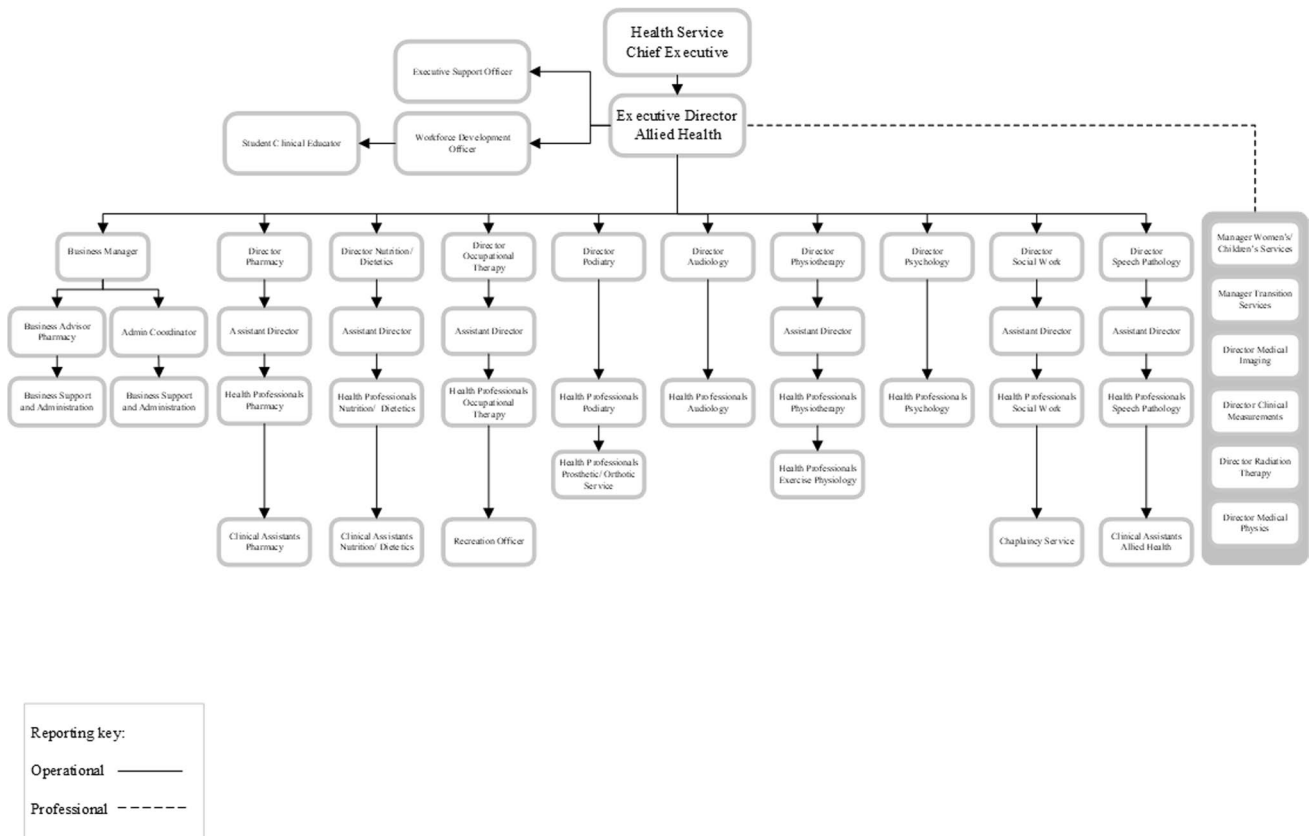
Reporting key:

Operational ———

Professional — — — —

Fig. 2 Allied Health Centralized Structure

Table 1 Number of participant who completed the survey in each profession across three years

Profession	2020	2021	2022
Administration	5 (16)	7 (17)	3 (18)
Allied Health Assistant	7 (22)	3 (23)	5 (24)
Audiology	1 (3)	1 (5)	0 (5)
Nurtrition & Dietetics	13 (36)	9 (37)	11 (37)
Occupational Therapy	27 (61)	24 (62)	21 (63)
Pharmacy	0 (100)	0 (101)	16 (103)
Physiotherapy	27 (72)	36 (74)	24 (78)
Podiatry	2 (5)	2 (6)	2 (9)
Psychology	6 (11)	7 (11)	7 (11)
Social Work	16 (37)	10 (39)	24 (43)
Speech Pathology	7 (12)	7 (14)	7 (13)
Total	94	90	96

The total number of employees in each profession is indicated in brackets for each year

a minimum, with the focus of the survey being on gaining qualitative feedback on the structural change.

This sector of the workforce is typically made up of a range of staffing levels from assistants, new graduates, base grade, senior, advanced and management levels. The staff who took part within each profession are typically representative of the professional roles that work in this sector. Not surprisingly, the professions of physiotherapy, occupational therapy and social work have higher numbers of clinicians working within bed-based services and hence have higher representation in the survey results. Additionally, the total number of employees who participated in the survey by profession is indicated in brackets in Table 1 to demonstrate how representative the sample is of the total population for that profession.

The profession of pharmacy was initially not included in the new centralized structure. This profession was incorporated into the new structure in 2021, but after the 2021 survey was administered. This would explain the no response rate from this profession in 2020 and 2021, but a higher completion rate in 2022. Medical imaging was not incorporated within the new allied health centralized structure and did not participate in the survey.

The response rate ranged from 25% (2020), 23% (2021) and 24% (2022) across the three years. This is a comparable response rate to a similar study published by Porter & Wilton (2020) on professional identity, in which they collected data following an organizational re-structuring in which

AHPs were integrated into a matrix structure, within a large multi-site health network in Victoria, Australia. The survey response rate for each survey conducted pre and post was 23.4% and 20.8%.

The survey asked two open-ended questions about what AHPs perceived to be the barriers or issues regarding the centralized structure and what they believed were the enablers or suggestions to improve the implementation. In addition, participants were asked to provide feedback on the structural change against the aims and reasons for implementing the change (see Appendix 1 for a copy of the survey).

Data analysis

To analyze the narrative data, a manual thematic analysis was completed using a six-phase thematic analysis methodology developed by Braun and Clarke, (2006). The data analysis method contains a rigorous coding and categorizing methodology that is driven by the data collected during the evaluation process, rather than any analytic preconceptions (Nowell et al. 2017). The analysis involved an inductive approach that first identifies themes, which are analyzed initially in a descriptive form before progressing to an interpretive form. The interpretive form attempts to look beyond the surface of the data where the broader meaning and ultimate implications of the themes/patterns are deduced via engagement with the literature (Braun and Clarke 2006).

To extrapolate the underlying themes, the first phase involved migrating the raw narrative data from the surveys to column A in a Microsoft Excel worksheet (one sheet per survey question 3, 4 and 5). The primary researcher spent time reading and re-reading the raw data for each of these questions, noting down initial ideas, thoughts, and potential codes/themes (in column B). The primary researcher used this part of the process as a key phase of data analysis—in other words, as an interpretive act (Lapadat and Lindsay 1999) in which the primary researcher looked for meaning in the data.

The second phase included generating a single column of all comments per question 3, 4 and 5. The single column of data per question was sorted and reviewed to remove any duplicate entries. The next step was the coding process to determine the potential themes emerging from the data. There were no pre-determined thematic areas in place before the coding process was initiated. For the coding process, each individual cell (participant comment) from the single column of data per question 3, 4, and 5 was reviewed and assigned a potential thematic area, to which a cell color code was applied (yellow, blue, orange, gray etc.).

This data-driven, inductive approach ultimately led to the identification of initial thematic areas, each labeled with a different color. The types of themes that came out of the data

were based on similarities of words to create the theme. For example, for the barriers/issues question 4, many participants talked about the problems related to arduous administration tasks. These types of comments were then coded to capture the essence of what the participants were expressing e.g., *inefficient, and arduous administration.* The codes were then assigned to potential themes for question 4 of which one included *"inefficient administration."* In contrast, for question 3 pertaining to whether the aims were being met, many perceived significant improvement and efficiencies with administration, with the code phrased as, *"improved administration."* The codes from question 3 were then placed against potential themes with those related to better administration coming under the theme of "*improved systems / processes*" for further analysis and discussion. If some points fell under two themes, the worksheet cell with the raw data was duplicated and each cell color-coded appropriately to ensure everything was recorded. Using the Excel sorting tool, the data was sorted by the color assigned to each cell, and therefore by thematic area. This sorting and collation approach brought together all the key points on each theme which determined the frequency of a theme raised by participants, which in turn assisted the researchers in determining the prominence of a theme (e.g., for the aims question, the frequency of respondents perceiving whether they believed all the aims were being met, versus whether they thought one or more were not being met was carefully considered in the analysis). After sorting and combining similar statements, the initial color-coded data analysis resulted in a list of comments sorted against potential codes/themes by each of the selected questions.

In phase three, the researchers analyzed and interpreted the data to make overall sense of it, rather than just paraphrasing or describing the data. Following the initial coding exercise, the data was copied for each question to a second Excel worksheet. This step involved a "first pass" over the data and involved grouping similar comments to consolidate the data. Every time the pass was performed for each thematic area per question, the data was moved to a new excel worksheet. The reason for the multiple worksheets was that the researchers could go back a step to the previous unconsolidated data set if needed.

To limit researcher bias and ensure the data was credible and accurate, phase four involved a two-researcher confirmation approach, in which each stage of the data analysis was reviewed. The first level involved reviewing at the level of the coded data extracts to determine if they formed a coherent pattern. If this was the case, the researcher then moved onto the second level of this phase to determine the validity of individual themes in relation to the data set. The primary researcher completed a re-read of the entire data set to firstly ascertain whether the themes worked in relation to the data set and secondly to code any additional data within

the themes that had been missed in earlier coding stages. The data pass steps were repeated five times (constant comparative analysis) to finally generate the most prominent themes. This process generated a thematic map of the analysis to ensure the analysis and data matched each other. The primary researcher stopped this process once the refinements of the data did not add anything substantial and used two ways to arrange and analyze the data. The first being most prevalent theme to the least prevalent related to the frequency of the information being raised by participants. The second included the Rashomon effect whereby the same event is described from the perspective of more than one participant (Sandelowski 1998).

Phase five defined and named the themes, which started once both researchers were satisfied with the thematic map of the data. This involved the researchers defining and further refining the themes to identify the essence of what each theme was about and determining what aspect of the data each theme captured. This phase included reporting of the themes and presenting these to AHPs who had the opportunity to complete the anonymous survey and who volunteered to attend one of a series of confirmation meetings. These meetings clarified and corroborated the generated themes, which confirmed the final set of emergent themes. It is important to note that the aims, barriers, and solutions will be discussed next under four key themes in a combined approach due to many of the solutions being similar to the aims of the new structure and a reverse of the barriers. This avoided duplicating information throughout the results/discussion section.

Results and discussion

Theme 1: systems and processes

The most prominent theme across the three years was that the centralized structure had greatly improved the systems and processes necessary for AHPs to operate their essential functions within hospital bed-based services. The findings about improvement in systems and processes are similar to the studies outlined in the literature that describe comparable benefits of a centralized allied health profession-based structure in public hospital settings (Law and Boyce 2003; Mickan et al 2019; Robinson and Compton 1996). The following comment sums up the general sentiment of the participants across the three years, *"I think overall things are going really well for allied health and the new structure is delivering on the aims it set out to achieve, there is a real sense of hope for the future" (occupational therapist).* The survey data indicated a high proportion of AHPs perceived the posited aims of the new structure were being achieved and that a centralized structure in bed-based services for

AHPs worked well. This was also confirmed at the confirmatory meetings; however, it was highlighted at these meetings that each profession needed a governance structure that could accommodate their diverse professional requirements.

Thus, a prominent and positive structural feature highlighted by participants was the single point of accountability for each profession, which they believed improved processes by decreasing ambiguity and improving communication (Mickan et al 2019). Comments highlighting this included, *"the clear reporting lines and channels of communication improves the speed of response to service needs" (physiotherapist)* and *"the new structure is a positive change with less confusion around reporting lines" (speech pathologist).* Furthermore, one reporting line decreased the duplication of tasks and subsequently streamlined payroll and administration duties. This resulted in significantly less employees with multiple position numbers, reducing the time required to perform many related administrative tasks, which resulted in improved efficiencies. The following comments reinforced this view point, *"the reporting lines are easier to navigate for operational and clinical needs" (social worker)* and *"direct reporting lines via each profession means that administrative tasks are more streamlined" (psychologist)* and *"communication and the ability to implement new models of care appear to be more streamlined and better supported" (physiotherapist)* and *"the new structure is much more efficient from an admin and payroll perspective, I don't need to spend hours correcting payroll errors, thank you" (administration staff member).* These benefits had substantial implications for not only the AHPs but also the organization due to more streamlined and efficient processes. For example, the grouping of each profession enabled the director of each professional area to complete and approve actions more promptly, reducing duplication of resources and costly administration errors.

Another prominent benefit of single lines of accountability included each director's ability to flexibly mobilize their staff more seamlessly. This created better delivery of prioritized clinical services due to less arduous negotiations with medical and nursing administrators. It also significantly improved the governance and accountability of staff within each profession. Moreover, the feedback from the participants suggested they believed this reduced patient risk by having an enhanced professional lens through high standards of professional supervision, skills training and support. The following comments sums up the general sentiment, *"there is a sense of team, improved accountability and enhanced professional support and career opportunities with the new structure, as well as improved staff mobilization to cover emergent leave" (speech pathologist).* Participants reported satisfaction with being able to rotate between clinical specialties which enhanced their career opportunities and succession planning.

One of the few related examples in the literature included research by Robinson and Compton (1996) which provided practical learnings from their re-structuring from a matrix to a centralized model for physiotherapy staff. Similar to the findings in this case study, they demonstrated for the physiotherapy profession multiple benefits of a centralized model in hospital bed-based services when compared to a matrix model in a very short period. One prominent similarity found not only for physiotherapy, but for all the professions included the operating improvements such as maintenance of staffing levels due to being able to have control of the budget. This resulted in savings being made very quickly due to streamlining processes, such as recruitment, rostering, backfill, ordering non-labor stock, etc. The following comment highlights this, "*we can take a whole of profession approach to movement of staffing into areas of higher need which is appreciated and effective especially throughout times of significant unplanned leave due to COVID and needing to isolate*" (occupational therapist).

Many of the system and process efficiencies gained from each profession having control of budget was due to the in-depth understanding and knowledge the directors had about their profession and how best to govern, roster and manage the workforce seamlessly when compared to the previous structure in which the operational manager was not of the same profession, which often resulted in arduous communications between multiple stakeholders to manage clinical demand across the clinical units.

Theme 2: professional identity

The second prominent theme demonstrated that the identity of each profession developed very quickly within the centralized structure and the participants generally expressed they felt more supported and comfortable within their own profession. The data analyzed from the survey results (and confirmed at profession meetings) reported that many respondents perceived that returning to a profession-based structure was positive. A high proportion of participants indicated that operating as professional groups and being in an allied health centralized structure was a better person-environment fit in comparison to the change associated with working in a matrix structure. For many of the AHPs, they perceived a strong sense of familiarity and belonging to their profession and to allied health when compared to their sense of belonging to their clinical unit and the organization. The following comment supports the general sentiment, "*profession specific led teams is proven to work, and this is how other tertiary facilities in Queensland run. Having a different profession govern a discipline they know very little about is a recipe for disaster which we have proven in our previous structure*" (dietitian).

This aligns to findings in research which has previously identified the importance of professional identity among AHPs (Braithwaite et al. 2006; Porter andWilton 2020). This is consistent with the multitude of comments from participants that the new structure was providing strong governance and accountability for each profession. The following comment highlights the general perception from participants, "*the centralized structure provides stronger accountability across the organization and uniform governance and consistency for allied health staff*" (psychologist). This is particularly important in hospital bed-based services given the highly specialized skills required to work competently in this setting. In contrast, there was a small number of respondents that identified more positively with the matrix structure, describing a strong allegiance with their multidisciplinary team and/or clinical unit. Therefore, the findings reinforce the importance of managing professional identity of AHPs during structural change, given their experiences of the structural alignment can be perceived differently (Beasley et al. 2020; Porter andWilton 2020).

This can be explained through Social Identity Theory in which an individual identifies with social groups partly to enhance self-esteem, which is probably why, in this case some of the AHPs did not adjust well to the new structure, even though transitioning to being a member of their own professional group would have been familiar to them (Ashforth and Mael 1989). Some AHPs felt a sense of loss for their multidisciplinary leader who provided them with positive reinforcement. The following comment highlights this, "*I am concerned that the profession specific model loses the importance of multidisciplinary care and fails to acknowledge how this profession-based change impacts service delivery. I think we need to have the multidisciplinary allied health lead in each clinical unit like before we re-structured to ensure we don't silo into professions when delivering care to patients*" (Physiotherapist).

This case study highlights that any type of structural change in healthcare is likely to impact professional identity in allied health due to the diversity of professions and that this needs to be managed accordingly. Beasley et al. (2020) recommended organizations recognize that AHPs are autonomous clinicians, who are members of several groups (i.e., own profession, healthcare teams and the organization), with all of these diverse roles influencing both their response and adaption to change. They stated that clear communication and affording opportunities to make decisions and provide feedback can improve employees' perceptions of change and positively impact their wellbeing (Beasley et al. 2020; Byers 2017). Furthermore, Braithewaite et al. (2005) recommended organizations concurrently consider both the previous and the new identities throughout a re-structure by explaining the change initiative and supporting employees to transition from the old to the new identity. This approach can

help to ensure security for employees, whose group status is threatened by the change process, as well as broaden perceptions of the ingroup, thereby assisting their acceptance of the new, post-change structure. This point flows into the third prominent theme pertaining to staff morale and wellbeing.

Theme 3: morale and wellbeing

Although the written responses analyzed from the survey questions indicated that a high proportion of participants believed the centralized allied health structure was a positive change, the findings also demonstrated that staff perceived morale and wellbeing to be an issue and was negatively impacted across the time the matrix structure was in place. This case study found low morale and wellbeing before restructuring AHPs working in hospital bed-based services into a centralized allied health structure. This was suggested to be more inherent in broader change that was occurring and associated with several years of ongoing budget cuts and organizational change in adjusting to a new tertiary facility. While there were many supporting statements the following comment expresses the general perception, *"there has been many years of incessant change and a lack of support and resourcing for clinical practitioners, with an expectation to just keep doing more with less due to the ongoing issues with the organizations budget" (social worker).*

Another influencing factor that occurred a few months following the re-structure was the COVID-19 pandemic, which participants perceived impacted morale and wellbeing. Literature describes the impact of the COVID-19 pandemic, which overwhelmed and stretched healthcare systems past their limits in terms of capacity and resources, while striving to continue to deliver quality care (Søvold et al. 2021). This resulted in significant impacts on the mental health and psychosocial wellbeing of frontline healthcare workers (including AHPs) and increased risk of depression and burnout (Søvold et al. 2021; Willis et al. 2021). The following comment supports this view, *"the workloads are unrelenting and leading to both overt and silent burnout. Increasing patient complexity and volume is beyond that which allied health staff can meet discharge planning and patient care demands" (occupational therapist).*

Within the narrative feedback, many comments were made that staff were thankful of being in a profession-based structure at the time the pandemic started. Participants believed the one line of accountability and professional expertise allowed immediate decision-making such as being able to mobilize staff quickly to the areas of most need. The following comment highlights this point, *"the new structure brought each profession together as a cohesive team which was invaluable during the pandemic where we needed the support from colleagues in our profession to cope and meet the demands" (physiotherapist).* During the pandemic, it became very clear that having a flexible and adaptable workforce and an overall professional director that understood the complexities and skill sets of their professional group was extremely important due to managing higher numbers of emergent sick leave.

The negative impact of the pandemic on staff morale and wellbeing was a prominent theme in both the 2021 and 2022 survey results due to workforce shortages and staff feeling significant pressure to do more with less with comments like, *"although overall I agree the new allied health structure has improved a number of parameters, the projected benefits have been clouded by other variables notably budget constraints and ongoing emergent leave due to the pandemic impacting resources" (social worker).* Even though the structure was considered positive, the pandemic added another layer of complexity that impacted staff morale negatively within the new structure. The pandemic placed added strain on staffing levels across allied health, nursing, medicine, operational and administration. The staff shortages impacted the organization's budget as shifts needed to be replaced or staff paid overtime to ensure there were adequate levels of staffing on the inpatient units. Many staff commented, *"staff morale could have been much worse in allied health if the matrix structure had still been in place as we would not have been able to be so adaptable and flexible within in our professions" (speech pathologist).* Therefore, even with the pressures described, the perception from AHPs was that morale had improved because of the new structure due to increased collaboration and support within each profession. Even though improvement in morale was evident within the allied health workforce, many of the participants perceived low morale was still an issue that required a targeted approach by the allied health leaders, which is discussed next.

Theme 4: Leadership training and resources to support the change

The final prominent theme from the data analysis was extrapolated from the open-ended question pertaining to the enablers that could improve the re-structure. The most prominent were resources and leadership, with many respondents reporting a perceived lack of project support in implementing the new structure. Even though many of the respondents believed the new structure had improved the operating systems, they perceived there was not enough resourcing to support the leaders to implement the change effectively with comments like, *"the structure is much better from an operating perspective, however more project resources are needed to help the leaders embed the new structure, particularly business, administration and human resource support for team building and helping staff to*

accept the change" (physiotherapist). Across the three years, the feedback continued to have a strong theme around lack of resourcing and the need to provide a dedicated project or workforce development officer role(s) so the professional directors could meet all the requirements to implement the change. There was the perception from participants that the under resourcing may have impacted the potential benefits of the re-structure.

Furthermore, the participants described concerns over the professional directors being reactive and that there was a lack of consistency between professions that was reinforcing the perception by participants that the professions were siloing and doing their own thing. The following comment sums up the general sentiment of the survey feedback, "*the professional directors need to establish consistency across the professions in relation to portfolios, expectations, accountability and workloads" (psychologist).*

A related theme raised by some participants was the lack of perceived capability and competence pertaining to management and leadership. The director roles were new positions created as part of the re-structure, with some being new incumbents to the organization. It was suggested the directors were not provided with the training they needed to lead and manage complex change. Many participants reinforced this point by providing feedback that for the allied health culture to improve more training was required for some of the professional directors to gain the necessary skills to do this effectively. Comments that reinforce this include, *"strong directorship is required to ensure a positive culture, and to support staff to provide safe clinical care, managers need to be empathetic, visible and connect with their staff" (physiotherapist)* and *"leadership and management training for some professional directors on how to effectively conduct strategic planning, communicate change, lead teams* etc.*is needed" (social worker).*

Mickan et al. (2019) supported these findings, concluding from their study of allied health managers and employees that for a structure to be successful credible, skilled, and respected allied health leaders were required to enact the systems and processes between AHPs and clinical service managers to ensure the necessary integration within clinical teams. Turato et al. (2022) findings emphasized the importance of allied health leaders developing the necessary skills in human resource management in hospitals to effectively manage relationships among people. They concluded this would improve morale and wellbeing as allied health managers and leaders would be better equipped to manage incivility through complex change. The following comments emphasize this theme, "*the professional directors should be trained in advanced communication and management skills and they must have a sense of empathy which is almost always overlooked when appointing someone into a management position however, I believe it is a key attribute*

in managing a large team" (dietitian) and *"the allied health leaders need to better understand the needs of clinical practitioners and make an effort to plan collaboratively, in a way that supports direct clinical care" (occupational therapist).*

Conclusions

This study reports on the perceptions, thoughts, and insights of AHPs working in hospital bed-based services that have re-structured from a matrix to a centralized allied health profession-based structure and the consequential impacts on the workforce. The results from the experiences and insights of participants in this case study demonstrated that within public hospital bed-based services, a centralized allied health structure was considered superior to a matrix structure (Boyce 2001, 2006; Mickan et al. 2019; Robinson and Compton 1996).

The reasons why the centralized structure was superior for AHPs working in bed-based services can be explained through the theory of organizational design, which not only highlights the importance of context, but also in taking a systematic approach to aligning structures, processes, leadership, culture, people, practices, and metrics to enable optimal performance (Burton and Obel 2018). Ultimately, the centralized allied health structure was a better person-context fit than the matrix structure. The main reasons being that the centralized structure supported AHPs to operate both administration and clinical practices efficiently through single lines of accountability that could effectively govern and support each profession, all of which improved the culture and morale of AHPs in bed-based services.

In contrast, the previous matrix structure was described by AHPs in this context as complex and confusing, which is reinforced by past research regarding the tell-tale signs of when a matrix structure is failing. The signs included the operational managers not having the necessary knowledge to effectively solve problems being raised by the professional managers. The operations were not coordinated, resource utilization was inefficient and costly, the clinical units were spending excessive time trying to coordinate and negotiate with each other, all of which resulted in staff feeling unhappy and confused (Burton and Obel 2018). Further issues described in literature and found in this case study were loss of professional identity, ambiguity, inconsistency, and frequent disagreements which further contributed to lower staff morale among AHPs (Robinson and Compton 1996; Turato et al 2023).

Hence, this case study demonstrates that an acute and sub-acute bed-based setting is different to other environments in which AHPs work, such as community and primary care settings, outside of the hospital context. In community and primary care settings, staff work autonomously as case

managers with a caseload of predominantly medically stable patients that are managed by their local doctor. The pace is slower with minimal pressure to discharge patients quickly from doctors, nurses and administrators that need access to inpatient beds. Therefore, the systems, processes and people can be managed more effectively to cope with sudden changes such as emergent leave, etc. Furthermore, staff who work in these contexts are often more senior AHPs who require less supervision, training, and governance due to having years of experience and expertise. Hence, the structural issues experienced in a fast-paced dynamic hospital setting do not appear to have the same impacts in settings where AHPs work as case managers.

In this case study, the matrix structure did not deliver on the anticipated outcomes for AHPs because the systems, processes and lines of authority required for AHPs to work effectively in this context were not appropriately executed and maintained. Moreover, the climate, leadership, knowledge sharing and decision-making processes at each junction point were not clearly defined or performing (Burton and Obel 2018). Further, the findings demonstrate for a matrix structure to work effectively, highly competent allied health managers who have good interpersonal communication, conflict management, negotiation, and political skills to manage up and down the organization is essential (Burton and Obel 2018).

This is also true for the centralized structure, even with single lines of accountability, the findings highlighted that leadership/management preparation and training for each professional manager is crucial before, during and after implementation to embed the new structure, manage complex change and ensure efficient performance. The findings demonstrated that this could have done better, including the provision of skilled project resources to support the professional managers to embed the new structure. Finally, the change in professional identity for AHPs is important to consider and manage to ensure consistency within and across professions, particularly in relation to the multidisciplinary team (i.e., individual professional identity versus the overall allied health identities at the clinical unit and management level). Even though the AHPs were returning to a familiar professional identity, it became clear that this needed to be more clearly defined, particularly for those clinicians who had an overall allied health leadership role within the multidisciplinary team.

This case study provides learnings that would be worth further investigation. The first being the importance of considering the evidence and theory of organizational design during the planning phase of a new structure so that all contingencies are considered in relation to AHPs working in contexts such as bed-based services. A number of factors may have contributed to this not being done in this case study, one of which included AHPs not having an allied health role on executive that could inform and provide counsel to administrators about the potential negative outcomes of the matrix structure for AHPs working in bed-based services. Another included the transitioning from regional to tertiary level services and the commissioning team not having a good understanding of what AHPs required to function, but rather taking a global organizational design perspective (i.e., one size fits all approach), which did not consider the specific needs of each professional group and what would be required for a matrix structure to be successful.

The findings in this case study add to the literature and emphasize that the context of public hospital bed-based services is not the same as other contexts and that the way AHPs are structured does have significant impact on their functioning. AHPs in this fast-paced setting need highly specialized skills and clearly defined operational and professional governance structures, systems, and processes in place to function optimally. Furthermore, competent profession-based management and leadership is required to ensure the unique and diverse requirements of each profession is being governed appropriately so AHPs can deliver high quality and prioritized clinical care. Additionally, both executive and professional director organizational representation and advocacy for AHPs in this context is vital so AHPs can contribute positively to the organization's objectives and performance. In conclusion, there is a need for further research that investigates and reports upon AHPs unique and dynamic professional contexts in which they operate, their position in the healthcare system and the ways in which they respond and adapt to change during organizational re-structures, including the external impacts imposed upon them (Boyce 2001; Callan et al. 2007; Porter and Wilton 2020; Turato et al. 2023). Specifically, further research regarding hospital system organizational design components pertaining to AHPs is encouraged, such as resource availability, training, staff turnover, morale, creation of a shared identity, representation, and system efficiencies, such as cost reduction.

Practical implications

This case study warns against organizations re-structuring AHPs in hospital bed-based services without considering the diverse requirements for AHPs to operate successfully in this context. Lack of due diligence in the planning phases of a new or modified organizational design can have substantial detrimental impacts on professional identity, morale and wellbeing and productivity, all of which can lead to poor or delayed outcomes for professional groups such as allied health. Furthermore, Braithewaite (2005) suggests allied health service restructurings would benefit from a combination of process and outcome evaluation measures (e.g., professional identity, retention, staff satisfaction and clinical

outcomes). Hence, the findings highlight the importance of considering an evidence-based approach when proposing a new structure in healthcare organizations so critical discussions about how organizational designs can be utilized to enhance service provision by AHPs within particular contexts are prominent. This approach would provide comprehensive evidence for healthcare administrators and commissioning teams to consider before they embark on widespread organizational change (Braithwaite et al. 2005; Turato et al. 2023).

Appendix 1

Allied health survey

The new centralized allied health structure for hospital bed-based services went live on 28 January 2020. It was decided the best way to gain feedback about how the new structure is progressing was by an annual confidential survey and follow-up meetings with each profession. We are now asking for your feedback as your opinion is highly valued and very important. The survey will take about 15–20 min to complete; thank you very much for taking the time to answer the following questions:

1. Do you consent for the confidential data you input into this survey be utilized for research?

   Yes, I give consent.
   No, I would rather not give consent.

2. What is your discipline?

   Administration.
   Allied Health Assistant.
   Audiology.
   Nutrition & Dietetics.
   Occupational Therapy.
   Pharmacy.
   Physiotherapy.
   Podiatry.
   Psychology.
   Social Work.
   Speech Pathology.
   Other.

3. Below are the aims and reasons for implementing the change. Please provide your feedback on which of the aims you believe the new structure is achieving and which require more work. Please be specific and provide as much detail as you can about why an aim is being achieved or not achieved.

- Reduced patient risk through an enhanced discipline lens
- Decreased confusion over reporting lines and improved communication to allied health staff
- Decreased duplication of tasks for allied health staff within each service group, e.g., quality, education and training programs, supervision, rostering, mandatory training, and workforce planning tasks such as leave management
- Improved flexibility to mobilize the allied health workforce based on clinical priority
- Improved governance and accountability of allied health staff
- Decreased administration time required to maintain the centralized allied health structure when comparted to the previous matrix (dispersed) structure: i.e., payroll tasks, maintaining rosters, workforce planning
- Improved support to the facilities outside of the tertiary facility
- Improved ability to implement new models of care, innovation, and research

Please provide as much detail as to whether you believe the reasons/aims for implementation are being achieved (or not achieved) and why.

4. Please list any barriers or issues you perceive regarding the new structure, providing as much detail as you can about the barrier and/or issue.

5. Please add any enablers or suggestions that would improve the new structure, providing as much detail as you can about the enabler or suggestion.

Declarations

Consent for publication Informed consent was obtained from all subjects involved in the study.

Competing interests The first author declares a conflict of interest due to being the executive allied health leader within the organization in which the study took place, which might be perceived as inappropriately influencing the representation or interpretation of reported research results. This was mitigated with the oversight of the second and third authors who reviewed the representation or interpretation of the data to ensure there was no bias.

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