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Management from the Nova School of Business & Economics

A BLUEPRINT TO ASSESS READINESS OF VALUE-BASED HEALTH
CARE IMPLEMENTATION WITHIN HEALTH CARE PROVIDERS: A
QUANTITATIVE APPROACH

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Abstract:

Value-Based Health Care (VBHC) has gained relevance and international exposure since its induction in 2006 but is not yet widespread. Pilot projects often fail during implementation, falsely indicating that VBHC is not a promising framework. A blueprint was developed, allowing health care providers to assess their readiness for VBHC implementation, identifying the dimensions and subdimensions needed for success. To rank them, a survey was sent to experts in the area. The quantitative analysis revealed how essential dimensions like Leadership and Organizational Culture are, while raised some questions about the real importance of Knowledge, especially when compared to Data Capabilities.

Keywords (Change Management, Value-based Health Care, VBHC Strategy, Implementation, Outcomes, Quantitative Analysis)

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1. Introduction

In 2006, Michael Porter and Elizabeth Teisberg introduced the Value-Based Health Care (VBHC) framework in their book "Redefining Health Care." This novel way of looking at health care is centered around the patient, aiming to improve the patients' outcomes while simultaneously reducing costs (Porter and Teisberg, 2006). The framework is defined as a system where health care providers are paid based on the patients' outcomes instead of receiving a fee for each service they provide regardless of outcomes as it is currently structured in the traditional fee-for-service healthcare model (Porter and Lee, 2013).

VBHC has gained significant international exposure over the years. With success stories of implementing crucial elements of the Value Agenda such as the creation of patient-centered Integrated Practice Units (IPU) at the American Cleveland Clinic in the USA, and the building of an enabling Information Technology platform for data collection at Santeon Hospitals in the Netherlands, clinicians are getting inspired by the improved patients' outcomes and reduced overtime costs of care (van der Nat, 2021). Additionally, the measurements of outcomes have been supported by Porters' International Consortium for Health Outcomes Measurements (ICHOM). This institutional approach was founded to define standard sets of outcomes for disease pathways for a growing range of conditions, facilitating the collection of outcomes for health care providers around the world (Porter, Larsson and Lee, 2016).

Despite the abundance of success stories, international growth, and institutional support, VBHC is still in its infancy and is not yet widespread (Feeley, 2021). The COVID-19 pandemic has exposed the vulnerability of health care systems in unprecedented ways, a thought potential opportunity for the VBHC framework to gain traction and increase its global presence. However, according to Feeley (2021), 75% of hospital leaders voiced that the global pandemic

was not going to become the tipping point for health care as we know it, deciding to stick with the fee-for-service models regardless of the financial disruption that it has caused and the potential of VBHC as a promising new model.

VBHC still has a long way to go towards becoming the primary revenue model in health care. Due to the resistance to move away from the model that persists, it is crucial that implementation is successful when a VBHC project is executed. When a project fails, the stakeholders within the internal environment often give up, as the complexity of the project is resource consuming. Additionally, the external environment will get the idea that VBHC is not worth the effort and does not yield the theoretical results.

Previous literature has researched the facilitators and barriers of implementing VBHC. This research goes further, delving deeper into the practicality of implementation on the ground, moving away from the theoretical approach. The dimensions that previous research have identified to be crucial, can differ from the dimensions identified as necessary by experts on the ground with first-hand implementation experience. This study aims to develop a blueprint that allows health care providers to assess their readiness for VBHC implementation, identifying the dimensions and subdimensions that increase their chances of success regarding project implementation.

The structure of this research commences with outlining relevant literature allowing us to better understand the positioning of other scholars on the characteristics of VBHC implementation. Subsequently, the use of both qualitative and quantitative analyses as our research methods will be justified, then the research is finalized with the development of a blueprint that covers

the dimensions needed to increase the chances of successful implementation within health care providers.

2. Literature Review

2.1 The Strategy of VBHC

Inefficiencies in Health Care Providers

Until recently, hospitals relied on fee-for-service payments to cover patients' expenses. There was no need to find another strategy as clinicians' arduous work, best practices, and excellent reputation kept attracting patients and human capital, which allowed hospitals to maximize revenues and maintain the necessary functions (Porter and Lee, 2015). Nowadays, the described operational efficiency is still important, though the decline in reimbursement is driving a revenue decrease, patients are becoming more demanding and, consequently, pressing health care providers to continue innovating and delivering (Porter and Lee, 2015). The mentioned factors, alongside the rising costs and the quality and cost disparity, have led health experts to re-evaluate the implemented system. For instance, the Health Care Cost Institute conducted a study demonstrating that the cost of C-sections performed in California is 4.5 times more expensive than in Tennessee (PWC, 2021). Despite some efforts to improve the current situation, such as attacking fraud, reducing errors, or even enforcing practice guidelines, the issues persisted. Hence, the urge to find a new strategy that leads to an actual impact became eminent (Porter and Lee, 2013).

Value in Health Care

In 2006, Porter and Teisberg challenged the current focus on profit and volume by proposing a new patient-centered approach: redefining the meaning of value and converting patients into the main priority (Porter and Lee, 2013). According to Porter, achieving high value for patients must be the goal of health care delivery, defining value as the health outcomes achieved per dollar spent (Porter, 2010). The ratio divides the outcomes that matter to the patient by the cost spent throughout the entire care pathway (Porter and Lee, 2013). The numerator encompasses

clinical outcomes of a procedure, treatment, or intervention and Patient-Reported Outcome Measures (PROMs) which designate the patient's discernment of the procedure, treatment, or intervention. Within this framework, patient value can be increased by improving outcomes and keeping costs stable, or decreasing costs without compromising outcomes, or both in the best-case scenario. By increasing value, the sustainability of health care systems increases and both patients, providers, payers, and remaining stakeholders will benefit from it (Porter, 2010).

The Value Agenda

Michael Porter and Elisabeth Teisberg developed a six-step strategy as a tool to increase value in Health Care: The Value Agenda (Porter and Teisberg, 2006). The first step is to organize care into Integrated Practice Units (IPUs), which is a care delivery model with a multidisciplinary team - a group of health care workers from different specialties and functions - that is organized around a medical condition, treating the patient over the complete cycle of care (Porter and Teisberg, 2006). This is important as it allows teams to develop expertise on the medical condition being treated, which positively influences the relationship between the volume of cases treated and the respective outcomes achieved.

The second step is to measure outcomes and costs for every patient. According to Porter and Teisberg (2006), a set of outcomes, clinical data, and PROMs, validated by a medical scientific society, should be created to regulate the quality of treatments, and ensure patients' needs are covered. If the clinical staff has an overall understanding of the outcomes that matter to the patient, decisions can be made cooperatively between the patient and the clinician, with the patient's best interest in mind. For instance, the outcome expectations after having knee surgery might differ from person to person (e.g., a professional football player is concerned with his ability to perform whereas a senior might not see this as a priority). Regarding costs, Time-

Driven Activity-Based Costing (TDABC) was introduced, which allows for the understanding of all the direct costs of treating a patient. This leads to numerous opportunities to optimize processes over the complete cycle of care by reducing unnecessary costs and improving efficiency.

The subsequent step is to move to bundled payments, in which health care providers are paid for the entire patient care cycle, which includes all the procedures, medication, devices, among others used to treat the patients' condition (Porter and Kap., 2016). This means providers receive one fixed payment, regardless of the number of procedures needed to treat the patient, reinsuring patients that no extra costs will be incurred in case more treatments are needed. On the other hand, health care providers profit from this situation as they are incentivised to improve efficiency, delivering the best care possible at the first try.

The fourth step is to integrate care delivery systems. In the article *Integrated delivery systems: the cure for fragmentation*, Enthoven (2009) described integrated care delivery systems (IDS) as organized and collaborative networks that connects health care providers to implement coordinated services. When treating a singular medical condition, there is no need to invest heavily in specific equipment for sporadic examinations. For example, a close-by health care provider can lend the equipment when needed. These synergies avoid unnecessary costs and increase cooperation between entities.

The following step of the Value Agenda is to expand geographical reach. Once a provider has succeeded in implementing VBHC, this knowledge can be transferred to other providers, through the creation of partnerships to disseminate VBHC. To successfully achieve this, fundamental dimensions such as organizational culture, should be considered as it can be

difficult to transfer a specific culture across different providers. Other factors such as the reluctance to compete with other centres of excellence can pose as obstacles to achieve this expansion.

The last step that Porter and Teisberg (2006) introduced in the Value Agenda is to build an enabling IT platform, which is needed to obtain all data points for each patient for their entire cycle of care. This allows for the ability to aggregate, extract, run analytics and display data over time and by medical condition. Furthermore, the interoperability of the system allows for data sharing within and across health care networks, facilitating homogeneous data collection and interpretation between providers.

2.2 Facilitators to implement VBHC

Transforming an entire fragmented system involves restructuring how care delivery is organized, measured and reimbursed and while some have not embraced the change, others – such as The Martini Klinik (Porter et al. 2014) in Germany or the Cleveland Clinic (Cleveland Clinic, 2016) in Ohio – have undertaken massive changes involving the Value Agenda - dramatically improving both outcomes and efficiency, which results in more patients, professional satisfaction and financial success (Porter and Lee, 2015). Depending on how effectively the health care provider is at delineating and executing a strategy to implement a value-based model, numerous factors can present as facilitators.

Leadership

Defined as “the behavior of an individual when directing the activities of a group towards a shared goal” (Al-Sawai, 2013), leadership within a provider becomes even more relevant when shifting towards a value-based model, involving motivation, knowledge, collaboration, and

change management. Several aspects have been identified that fit with both transformational and collaborative leadership styles. The first emphasizes effectiveness when a sense of mission is present (Dijk, 2021). Leaders that have the vision and communicate their mission in a meaningful and exciting way, create unity and a collective purpose, empowering others (Al-Sawai, 2013). For a change towards VBHC, there needs to be a leader that believes and sees the value in the model, with intrinsic motivation for this change (Zipfel et al. 2019). Without it, it becomes difficult to get other staff members on board. In a similar dimension, Antunes et al. (2013) analyzed PROMs implementation in palliative care through a systematic review of 31 articles, finding that the most important facilitator was having a coordinator through the implementation process, adding that sensitive leadership was needed to mitigate fears of change, being assessed, and added work, which might lead to behavior which opposes change.

Organizational Culture

The second leadership style often identified within VBHC – collaborative leadership - is tied with organizational culture. Collaborative leaders effectively communicate information to all stakeholders involved, allowing them to make informed decisions (Al-Sawai, 2013). Organizational culture is highly influenced by leadership as values and beliefs can be established by leaders and reinforced and communicated through various methods, shaping employee perception, behaviour and understanding (Tsai, 2011). Therefore, it is crucial to develop a collective understanding of value and ensure long-term commitment as the clinicians, patients and external stakeholders unite around a shared ambition (Porter and Lee, 2013), defining new priorities (Apon et al. 2021) to create transparency and improve health care outcomes (BCG, 2018).

When analyzing ways to implement improvement processes that add value to VBHC models, Zipfel et al. (2019) found that clinical teams should be diverse, including all relevant healthcare professionals. This multi-discipline collaboration was also an encouraging factor for PROMs implementation found by Amini et al. (2021) when analyzing the facilitators and barriers for implementing PROMs in clinical care. Personal importance and involvement are also necessary (Zipfel et al. 2019), corroborating the importance of having a sense of purpose across stakeholders (BCG, 2018). Furthermore, researchers pointed out that the patient should be empowered to be part of the decision-making process (BCG, 2018), being included in care coordination and communication (Damman et al. 2020). The team involved in the project should have continuous organizational support from the management (Dijk, 2021) as they play a crucial role in clearing the barriers so the team can focus on implementation.

To make sure that value improvement is continuous, climate, continuous monitoring and evaluation are essential (Zipfel et al. 2019). Health care providers should foster internal learning, support professionals, and provide feedback to clinicians, with the correct environment being crucial (BCG, 2018) for them to consider alternative improvement initiatives without the fear of being assessed (Antunes et al. 2013). Shared ambition, consistency, and a long-term commitment to VBHC (Porter and Lee, 2013) are other facilitators that allow for the success of this model. To ensure this shared ambition, numerous initiatives can be taken such as making VBHC as part of the governance, being a common topic in board meetings, to make sure it is being followed and evaluated to ensure efficiency and the creation of added value (BCG, 2018).

Data Capabilities

Data collection is crucial in VBHC to measure and improve value, outcomes need to be collected through several sources and then analyzed so best practices are identified and resources are steered in the pathways that create the best results (Soderlund et al. 2012). This data should be collected and made available to clinicians at the point of decision-making, not retroactively (Bethke et al. 2020), while being presented in a clear (Boyce et al. 2014) and easily accessible way (Amini et al. 2021) as to facilitate the shared decision-making process (Damman et al. 2020). Additionally, data from other providers should be made available to allow for benchmarking and comparison (BCG, 2018).

These efforts are facilitated by new systems and capabilities within health care IT that make it possible to collect and share outcome data across clinicians, providers, and the public (Soderlund et al. 2012). According to Soderlund et al. (2012), health outcomes improve the most when clinicians themselves are responsible both for collecting and interpreting the data, leading efforts towards clinical improvement, showing that active engagement and leadership are needed. This engagement is facilitated and supported by the existence of a common legal framework regulating the use of patient data, a limited number of shared IT platforms, and the existence of common standards for tracking treatments, costs, and outcomes at the patient level. Without these common standards, the definitions and sets used often vary between institutions and countries, hindering comparisons (Damman et al. 2020)

Knowledge

“A successful shift [towards VBHC] requires a step-by-step approach from simple to complex, driven by a collaboration of patients, health authorities, payers, and providers” (Busink et al. 2019), each with its role to play in improving value (Porter and Lee, 2013). This shift is

facilitated by education (Antunes et al. 2013) and knowledge on VBHC across all stakeholders involved (Amini et al. 2021), such as knowledge on the use of PROMs in medical encounters, which is something that clinicians are often unfamiliarized with (Santana et al. 2015). Furthermore, given that a value-based model requires multidisciplinary teams, clinicians must be educated in areas outside of their medical education including on areas such as business and economics of medicine and the development of teamworking skills (Bethke et al. 2020).

Infrastructure

The role of the government distinguished itself as a facilitator in the transition to Value-Based Health Care (Soderlund et al. 2012) as it can play a vital role in facilitating engagement by providing support for clinicians to design, collect and share data among themselves, through, for example, early seed funding for registries and research (Soderlund et al. 2012). Furthermore, it can encourage and invest in the creation of a shared IT platform, contributing to the interoperability of data sets among registries and the transition to effective e-health records. Finally, as a fundamental payer for health care, the government can create incentives for the use of VBHC models or make VBHC a priority in the health care budget allocation.

2.3 Barriers to Implement VBHC

Research over the past year has shown that it is no longer about whether VBHC works, but rather how it is implemented. The implementation of such a framework requires fundamental changes to a health care providers' internal strategy and structure. Intuitively, the previously discussed facilitators of the implementation of a Value-Based Health Care program, can also act as barriers if these dimensions are not present or not adequately applied within the given health care provider. Therefore, following previous literature, these barriers fall into similar dimensions.

Leadership

Value-Based Health Care is a framework that cannot be successfully implemented without the devoted cooperation of the entire team involved. Leadership is therefore a crucial element of the implementation process. Amini et al. (2021) found that without a defined leadership structure, specifically having more than one clinical leader, diverse levels of motivation emerge within the team of staff. If the entire team including nurses, clinicians, executive members, and administrative staff do not share the same levels of motivation, the coordination between these stakeholders is affected (Gibler et al. 2019). Nilsson et al. (2018) found comparable results in their study where 19 interviews with the dedicated staff involved in the VBHC environment were conducted with the goal of understanding their experiences over the two previous years regarding the VBHC implementation in a Swedish hospital. A barrier to successful implementation that emerged was the miscommunication among the staff due to the lack of dedication and guidance of the clinical leader. This lack of communication between staff members resulted in less engagement towards the project (Nilsson et al. 2018). These two studies indicate the importance of leaders fostering the motivation and passion for the project within the involved stakeholders.

The core of the development of the VBHC framework was designed to create value for the patients, increasing outcomes and improving quality of life. However, for the model to be effective, patients need to be on board and understand the value of completing PROMs, sharing their data, and being comfortable that their outcomes are used for comparison. Gilber et al. (2019) indicated in their study reported by McKinsey, that inconsistent alignment between the leader and the clinical staff is a barrier to the transferring of knowledge and motivation to the patients. If the physicians are not fully committed to the project, then the patient will not fully grasp the value of the project either.

In an analysis by Commins (2018), common mistakes made by VBHC leaders, that can act as barriers to successful implementation, were researched. When leaders do not know the reason for their move towards VBHC nor have a clear game plan in mind, goals become unrealistic and unattainable (Commins, 2018). There is not a one size fits all to implement VBHC, and it is, therefore, crucial for leaders to be actively engaged in every step of the process to break down barriers along the way and make progress on them (Commins, 2018).

Organizational Culture

Leadership and Organizational Culture are reinforcing or weakening dimensions as they influence one another. The culture that exists within a team is partially influenced by leadership but as well by the team and environment itself. Gilber et al (2019), found that when there is a lack of coordination and transparency between different team leaders, as well as within the team, the transparent and open culture is exposed to vulnerabilities leading to misalignment of program incentives and operational priorities.

Amini et al. (2021) found that the additional responsibilities of the new commitments towards PROMs incorporation as well as time constraints of the staff, impede success. Antunes et al. (2013) found equivalent results, where not having enough staff, time constraints and the fear among the staff of additional responsibilities, acted as limitations to successful implementation. These key factors that were lacking in both studies, can lead to poor organization of care and multidisciplinary cooperation (Amini et al. 2021).

To keep improving and creating value for the patients, a culture of sharing patient outcome data must be established. Gibler et al (2019) found that barriers within the organizational

culture regarding sharing of outcomes included the lack of trust between physicians as well as performance not being tracked. Results found by Antunes et al. (2013) support this, as the fear of being assessed - and one's work is open to criticism due to PROMs results - played as a barrier for the successful implementation of the VBHC project.

Data Capabilities

With data collection at the core of success for VBHC, having an integrated IT system within the organization is key, meaning a system that allows data from various sources such as Electronic Health Records (EHRs) and survey-based outcome data to be merged, analysed, benchmarked, and presented together. Amini et al. (2021) found that issues with IT infrastructure acted as the main impediment for successful PROMs collection and analysis, characterized by poor access to the web-based platform, a slow response time of the IT-platform and poor integration of the PROMs into the EHRs. It is not only important to have data collection systems, but according to a study conducted by Batty et al. (2012), IT administrative support can also act as an impediment to success; without involved staff administrating the IT systems, the success of implementation can be hindered.

Data capabilities are not only of importance for the health care provider but also for the patients. Antunes et al. (2013) found that when tools are too complicated to use for patients and families, these can act as a barrier to success as it leads to a lower response rate on PROMs, decreasing outcome data. Without a simple, easily accessible IT platform, the success of implementation is therefore affected.

Lastly the privacy of data collection acts as a crucial barrier as well. Data collection and sharing regulations differ based on the location of VBHC implementation meaning that outcome data

of patients cannot be freely collected nor shared with partnering hospitals. Batty et al. (2012) indicated that the main barrier to the successful implementation of VBHC is privacy issues, where there is a lack of clarity concerning the availability of privacy measures.

Knowledge

As VBHC is a framework that is not yet widespread, it is important that all stakeholders are educated on the purpose of VBHC. Lack of training of physicians and administrators on the use of PROMs as well as lack of education for patients on the meaning of filling out PROMs, acted as barriers in the successful implementation of VBHC in the study by Amini et al. (2021). Gibler et al (2019) added that misperceptions about the programs, the lack of awareness, and the willingness to fully grasp VBHC, are limitations to success.

An additional barrier concerns the misperception that the VBHC teams have enough knowledge about the entire process, to be able to start (Nilsson et al. 2018). By rushing into VBHC without the needed preparation, the team runs the risk of not being able to anticipate the amount and types of resources that are needed, and preventable roadblocks become inevitable (Nilsson et al. 2018). Not only do the VBHC teams need to have the necessary basis knowledge to start the process, but this knowledge needs to be transferred to the patients as well, to incentivize their cooperation in, and motivation towards the project (van Egdom et al. 2019).

Lastly, Gilber et al (2019) found an additional barrier within knowledge that concerns the inability of leaders to have the proper education and knowledge to take advantage of value opportunities in already existing programs, such as knowing "what outcomes are already being measured and what data platform is already in place that could facilitate the transition to

VBHC.” When a health care provider is leaning towards shifting to VBHC, it is important that they first know how to leverage the data and facilities that they already have and build from there.

3. Methodology

For our methodological approach, we used both qualitative and quantitative methods. Through qualitative content analysis (Bengtsson, 2016) and drawing on our interviews, we analyzed common themes that emerged from different interviews and grouped them into subdimensions to explain our findings more easily. In parallel, we conducted an online survey in which participants could rate the dimensions and subdimensions found in literature and the first wave of interviews to understand which ones were the most critical to improving chances of success when implementing a VBHC program.

3.1 Qualitative Approach

Leveraging on the interviewers' native languages, the interviews were conducted in both Dutch, English, and Portuguese, to accommodate our interviewees for any language barriers while extracting the most information possible. Prior to each interview, permission for the recording of the interview audio was requested to be used within the scope of the project, and interviews were later translated and transcribed in English for the analysis.

Data collection took place for one month (13/10/2021 – 09/11/2021). We conducted semi-structured interviews that followed the same guide (see Appendix 1), which allowed us to extract the data to fulfil the purpose of the study while giving room for the interviewees to provide their insights, delving into topics they found the most relevant according to their experience.

When selecting the interviewees, we followed the purposeful expert sampling method (Palinkas et al. 2015), which consists of a non-probability sampling in which we identified experts who were knowledgeable on VBHC and who had experience working on the ground.

We researched previous work conducted on the topics of VBHC, reputable organizations such as ICHOM and IBRAVS (Instituto Brasileiro de Valor em Saúde), and providers who have implemented VBHC projects, reaching a list of potential participants that included researchers, consultants, clinical and managerial staff with extensive experience, including in the design and implementation of VBHC projects, among others.

Based on this criteria, 37 experts were identified and contacted (see Appendix 2), of which 18 showed availability and interest in being a part of this study and granted us an interview (see Appendix 3). Additionally, 8 other participants showed initial willingness to participate in the study but later declined meeting invites or did not reply when trying to arrange a suitable time slot. An additional 7 interviews, previously conducted on the topic were used (what we refer to as the first wave of interviews), as we were provided the transcripts by our orientator Professor João Marques Gomes and instructed to use them as part of our analysis (see Appendix 3).

To analyze the data, we used a qualitative content approach (see Appendix 4), to examine varying perspectives from the specialists interviewed. The purpose of this method is to organize and derive meaning from the data collected, drawing realistic conclusions from it (Bengtsson, 2016). To do this, we divided the content collected in the interviews into categories, which we called dimensions (included broader topics such as leadership and organizational), which allowed us to reduce the text and focus on the categories for specific words and patterns. Based on common themes and patterns that emerged, the data was then divided into subdimensions (specific themes within each dimension such as the profile of a leader, within the dimension of leadership) which allowed us to dive deeply into each topic and clearly focus on the purpose

of the study. Based on this analysis, we then developed a blueprint with the success determinants interviewees considered the most relevant when implementing a VBHC project.

Using this methodology seemed suitable for multiple reasons. First, previous scholars have used this methodology to analyze insights from interviews with experts within the field (Nilsson et al. 2017). Then, resorting to individual semi-structured interviews instead of other methods such as a focus group was more suitable as it allowed us to not only reach experts in different time zones, with extremely limited time slots available but also to give space to each interviewee to provide insights on their specific area of expertise, while accommodating for language barriers. Finally, using a qualitative content analysis approach seemed the most suitable as it allowed us to categorize the data, searching for emerging themes and patterns, which allowed us to compile a list of detailed information a health care provider should consider when wanting to shift to VBHC.

3.2 Quantitative Approach

Given that ranking the dimensions found in literature, as well as the qualitative content analysis required objective data collection, experts in Value-Based Health Care were provided with an online survey (see Appendix 5) between November and December.

The survey was conducted through the online Qualtrics platform and sent via email. The data collected through online platforms, such as Qualtrics, is suitable for many reasons, namely the possibility to customize the survey at a low administrative cost (Evans and Mathur, 2015). Furthermore, it provides a link that allows participants to access the survey without spatial and temporal restrictions.

Out of the list of 37 experts identified (see Appendix 3), only seventeen participated in the survey, which could eventually lead to limitations when interpreting the data. Moreover, since the sample was smaller than 30 and to avoid compromising the analysis, some tests were not performed leading to a lack of depth and understanding of the evidence. Furthermore, the data can contain biases due to the absence of diversity regarding participants' current occupations.

In this sense, the survey was divided into three parts (see Appendix 5). The first part assessed the most relevant dimensions found in the literature review, namely Leadership, Organizational Culture, Knowledge, Data Collection, and Infrastructure and respective subdimensions needed for a successful implementation of VBHC within a health care provider and its degree of importance by asking them to rate on a scale from 0 to 10. Furthermore, participants were given the chance to identify dimensions that they deemed important to ensure no dimensions were overlooked. In the second part of the survey, a set of questions were asked to better identify and define the sample and to understand how their background and occupation could be related to their previous answers. The last part of the survey questioned the sample regarding their studies in VBHC for a better comprehension of their expertise in this subject.

Based on this analysis, a blueprint was developed in which the dimensions and subdimensions were ranked based on the mean values, calculated with SPSS and Excel. This was derived from the participants' ratings, to allow for comparison with the qualitative blueprint and draw further conclusions.

4.2 Quantitative Analysis

4.2.1 Sample Characterization

To understand and better characterize the participants, a descriptive statistical analysis was performed based on the gathered demographic indicators. In total, our sample contemplated seventeen VBHC experts from which eleven were based in European countries, including Belgium, Denmark, Netherlands, Portugal and the United Kingdom, then three wherefrom South America (Brazil and Chile) and the remaining from the United States of America.

The most incident age group was 35-44 (41.2%) followed by 45-54 (29.4%) and 55+ (17.6%). According to our survey, approximately 59% of the participants had a master's as their highest attained education level while the remaining 41% diverged between a PhD, post PhD, and a Bachelor's Degree. Regarding their current occupation, 94% of the sample worked in VBHC, and their overall occupations derived between academic background, namely Researchers and University Professors, clinical and management positions.

Currently, the participants work in Value-Based Health Care implementation in Belgium, Brazil, Spain, Switzerland, Netherlands, Portugal, the UK and the USA. Some mention all around Europe, while others even name a World Wide intervention. Out of 17, 13 studied VBHC and four of them at Harvard.

4.2.2 Outliers

Before performing quantitative analysis, it was necessary to guarantee the detection and, if needed, elimination of outliers. An outlier represents an uncommon response profile or extreme value, either very high or low, that can affect the interpretation of data (Hawkins, 1980).

Therefore, to avoid a biased and misleading analysis, one should perform tests to identify them. The used method to assess outliers was the Box-Plot performed using Stata (see Appendix 6).

A Box-Plot graph, also known as Whisker's plot, is a commonly used ally to detect outliers. It displays the summary of a set of data which includes: the minimum value or lower fence, the first quartile, the median, the third quartile and also the maximum value, or upper fence (Schwertman et al, 2004). The outliers are located outside of the upper and lower fence and are identified in the graph with a circle or a star.

Hence, since the survey included 35 subdimensions, a box-plot was made to analyse each subdimension individually and were found 12 extreme values (see Appendix 6 and 7). Then, as a way to understand their impact, the chosen metrics to rank the dimensions and subdimensions, the mean and standard deviation of each of them, were performed two times: one considering these values and the other removing them. The results demonstrated that with or without the outliers, the order of importance of the main dimensions remained the same and only occurred non-relevant changes between some subdimensions.

Thus, analyzing these results and considering how small the sample is and how diverse the participants' profiles are, which can lead, for example, to opposite perspectives when looking at topics such as Knowledge or Data Capabilities, it was not clear that these values were outliers and not just different opinions regarding the same matter. For this reason, and since the results were not influenced, the decision to keep them was made.

4.2.3 Descriptive Analysis

As briefly explained before, the second part of the survey aimed to rank the subdimensions found in the first wave of interviews and literature review. Hence, 35 subdimensions were gathered and, to ensure unbiased results, there was no reference in the online survey to which dimension each sentence was related. Furthermore, the subdimensions named were only the most important and relevant, otherwise participants would face a heavy number of statements.

Leadership

As stated in previous chapters, Leadership is one of the most significant dimensions when implementing a value-based approach in a health care provider. And, in order to prove it, the survey compiled six questions raising crucial statements found in the literature review, namely the types of leaders, leadership structure, VBHC team, and so on (see Appendix 5).

After aggregating all leadership-related topics and performing the needed metrics, the overall mean of this dimension was 8.75, plus the median was 9. Acknowledging the scale of importance was from 1 to 10, one can conclude that this dimension is indeed very relevant for participants and, without any doubt, a basilar step when looking at such implementation in health care providers.

Leveraging this dimension, “A clinical leader within the medical field that can act as a spokesperson for the clinical staff” registered the highest mean in the sample, a 9.12 out of 10. Additionally, the median of this factor of success was 10, demonstrating that, despite their different backgrounds and occupations, all participants agree that it is fundamental to have a clinical leader that represents and understands the clinical staff necessities and wills. The second-ranked subdimension is “Motivation and enthusiasm within the team”, which had 8.94,

followed by “Effective relationships based on trust” (8.88) and “Clear Leadership Structure” (8.82).

“A leader with a project management/consultancy profile that deals with the day to day of the project, engaging all necessary stakeholders” comes at fifth, which builds on the importance of the leader’s profile and how that is valued. Finally, “Access to a VBHC team that provides support and guidance” not only has the lowest mean in this dimension but also the highest standard deviation (1.84). While 29.4% of participants rated this dimension as a 6, or lowest, the same amount of participants rated it as 9. The doubts raised by this subdimension could be related to some considering that it is more relevant for a leader with specific characteristics and capabilities than a team to support the project, or some participants might have misunderstood it as part of the organizational culture dimension and structure.

Organizational Culture

Following Leadership, the second dimension assessed in the survey was Organizational Culture. The complexity of this dimension and the variety of vital subdimensions gathered in just one topic led to the selection of 14 subdimensions that represent, and aim to measure, its relevance (see Appendix 5). For this reason, the statements used broadly mention crucial subjects such as goals, collaboration within the organization, communication, stakeholder’s interest, environment, and more.

The results of the overall mean do not come as a surprise. This dimension has an overall average of 8.26, slightly lower than Leadership but still close, and has 9 as its median. The questions raised to describe this topic led to more disagreement between participants, observed by its higher standard deviation, which can be explained by the wide variety of subdimensions

selected. “Common goals, values and long-term commitment within the team” (8.94) and “Multidisciplinary Collaboration” (8.82) had the higher mean in this dimension: one can conclude that participants agree that not only is fundamental for all involved staff to share the same vision and goals but also to collaborate in order to achieve the overall objectives.

By ranking “Stakeholders interests aligned” as the third subdimension, participants demonstrate how suitable for them it is to share a vision and to be on the same page, in order to better implement such an approach in health care providers. Both “Support from the Executive Board” and “Promote open communication between colleagues” have the same average (8.47). However, there is a clear difference in the standard deviation. While the former has a standard deviation of 1.87, the latter has 1.37. Interestingly, when looking in detail at the data set, one can interpret that the reason behind the higher standard deviation of “Support from the Executive Board” can be attributed to one participant who rated it as 3, while the rest attributed 6, 8, 9 and 10. The same participant was asked in another question to state a reason for a bad implementation of VBHC mentioned, how, despite having the support of “high-management”, if the physicians do not “buy-in” and participate actively, there will not be a successful implementation. It can be interpreted that, for this participant, the relevance of the support from the board is irrelevant compared to the persistence of clinical staff. This opinion adds another meaning to this dimension.

Next, “Create a safe learning environment and a continuous improvement cycle” had a mean of 8.41, followed by “A clear definition of what success looks like for the team and the project” (8.29), a “Constant Feedback” (8.18) and “Proper Care organization and delivery” (8.00). Then, the ninth-ranked dimension, “Create an incentive structure that aligned stakeholders' interest”, also raised some dispersion between experts. This result aligns with the information

found in the literature review: an incentive structure could work as a facilitator and motivate staff however some experts pointed out successful implementations in which this was not necessary.

The following subdimension is “Governance: common topic in board meetings, ensure uniformity and guide stakeholders” with a mean of 7.82 and then “Regular staff meetings” with 7.76. The regularity of staff meetings and VBHC implementation as a current topic in board meetings help align all stakeholders and keep them accountable for the evolution of the project. Lastly, the statement with a lower mean (7.53), “Consistency: implementing the same model”. When assessing this topic in the survey, the main objective was to understand how participants rated the importance of consistency and data collection standardization when implementing the same model. But, since, as mentioned in Methodology, one of the survey limitations is the possibility of unclear interpretations, there should be admitted the possibility that participants misunderstood the statement and considered it meant that the VBHC implementation should be “one size fits it all” and gave it lower punctuation. An implementation of the same model across every health care provider was strongly discouraged throughout this study.

Knowledge

The transition from a traditional fee-for-service model to a value-based approach has many challenges, but one of the main barriers is the lack of information on what it actually stands by and the implicit steps needed for a successful implementation. For this reason, the third dimension chosen to assess was Knowledge. The same procedure was followed to determine which subdimensions should be added to the survey, and, in this case, the statements involved VBHC training among staff members, patients and also skill acquisition across positions (see Appendix 5).

The sample rated Knowledge with lower punctuation when compared with the previous dimensions (7.74). Simultaneously, this topic has a higher standard deviation (1.68), demonstrating that participants opinions differ when discussing the different types of knowledge. The statement “Patient’s Care Pathway understanding” has a mean of 8.35. A deep understanding of a patient’s care pathway is one of the first steps to detect inefficiencies in a provider, and for this reason, it should be mastered by all stakeholders.

Next, “Make use of already existing programs and ways-of-working” has 7.94 and “Promotion of skill acquisition that go beyond their functions” with a mean of 7.53”. Then, the statement that led participants to a higher disagreement “VBHC training for all staff involved in the project (among the staff, clinical staff, board members and managers)” displaying the highest standard deviation (1.98). This result seems to contradict the literature and the first wave of interviews. A possible reason is that, in an initial stage of implementation, the VBHC training should target only those that are directly impacted, such as physicians, and, in the long-term, invest in the remaining staff. The patient’s awareness and knowledge about VBHC, mainly regarding PROMs and their utility, is a relevant point, nevertheless, it is not the most urgent topic when performing a transformation, which justifies why “Invest in patient’s awareness about VBHC” comes in last.

Data Capabilities

Data Capabilities is the fourth dimension of the survey. The ability to collect patient-related data and analyze it in a shared IT System is determinant for a thriving VBHC approach because it grants a better understanding of patients’ needs and their care pathways, at the same time, helps to aggregate data simply and practically for clinical staff to consult it. These

subdimensions were mentioned in the survey to clarify how relevant they are (see Appendix 5).

Data capabilities surpass Knowledge with an overall mean of 8.24. Moreover, until this point, this is the dimension with a lower standard deviation, meaning experts share a common opinion about the importance of this dimension when implementing VBHC. There were two subdimensions with a mean of 8.53: “Leverage of the existing data” and “Practical systems that are easy to access and comprehend”. Both statements reinforce the need to find systems that facilitate and deliver the needed data without losing the data already collected.

Then, “Data and systems integration” with 8.41 and “Systems and Capabilities within Health Care IT that allows the collection and sharing outcome data and information broadly across clinicians and the public” with a mean of 8.35. Next, the statement “Existence of common standards for tracking treatments, costs and outcomes at patient level” reveals the need to use standard tracking processes to ease the data comparison and discussion. Lastly, a “Limited number of IT platforms”, with a mean of 7.41, aims to assurance practicality and simplicity to the ways of working and avoid data duplication.

Infrastructure

Infrastructures, the last dimension, joins general topics found in literature: the government role, especially in the legal system and financial situation (see Appendix 5). With a mean of 7.76, this dimension attains a fourth place in the rank. Additionally, since this dimension assembles many different topics and some unrelated, it obtained the highest standard, indicating that the data collected is dispersed and there is no general agreement between participants.

“Sufficient staff for support and coordination” is the subdimension with a higher mean (8.47). “Clarity regarding availability and confidentiality measures”, with 8.12, recalls that gathering patient’s related data can raise privacy issues and, to transform this barrier into a facilitator, providers must be aware of the policies that protect data. The two subdimensions, “Existence of financial triggers to boost VBHC implementation” and “Being financially stable”, have the lowest means in this dimension and the highest standard deviations. Despite displaying different perspectives of a successful financial position when entering Value-Based Health Care, it is interesting that the results are not contrary but quite similar and, for this reason, one can argue that the financial position of a health care provider generates discord between experts. While some agree that the existence of financial triggers can be the starting point of a transformation, some defend that being financially stable allows the provider to leave behind the traditional approach and implement this approach with a higher willingness to take risks.

After analyzing each dimension and subdimension based on each mean and standard deviation, Leadership turned out to be the most relevant dimension, followed closely by Organizational Culture, Data Collection Systems, Infrastructures, and the least important is Knowledge. The importance of Leadership and Organization Culture was a recurrent topic in previous chapters, but the lower punctuation given to Knowledge, especially when compared to Data Capabilities and Infrastructures, came as a surprise to this study. Even if outliers were removed, the order would not change. To have a better understanding of why Knowledge did not perform as expected, further research must be conducted.

Moreover, when looking at standard deviation, one can conclude experts are aligned and in agreement when rating both Data Collection and Leadership, while some disagree in the weight attributed to Knowledge and Infrastructure.

It should be recalled that all dimensions and subdimensions had means above five, which represented the breaking point between a relevant or irrelevant topic, meaning all topics pictured in the survey are important when assessing the readiness for a VBHC implementation in a health care provider. The sample size precluded performing some relevant tests, which present a limitation for this study.

4.2.4 Bad Implementations

After ranking the subdimensions, to understand if there was no other subdimension missing, participants were asked if they were aware of an example of a bad implementation of VBHC and, in case they were, to mention some factors that could have led to this outcome. Open-text questions allow the participants to write down what comes to their minds and add more value to the already discussed dimensions. Eleven out of seventeen participants affirmed that they were aware of a bad implementation and willingly provided some interesting insights that build on the subdimensions ranked.

One of the answers that stood out was a participant that reflected on how the concept of VBHC should not be narrowed to treating patients, as explained below:

“This tends to neglect the personal and contextual values of the patients' lives and does not encompass the intrinsic value of the act of caring. It means that VBHC is important and critical to the survival of health equity, but it must be clear that "making a difference" in patients' lives is more intangible and therefore difficult to measure. The message must be necessary and essential VBHC, but with constant adjustments to suit treatment and health care.”

Additionally, some subdimensions of Leadership and Organizational Culture were mentioned, such as the lack of feedback, communication within the same team and governance. Goals, the definition of success and long-term perspectives were also pain points in those implementations. Participants were also vigorous when mentioning that measuring outcomes were the breaking point in some transformations. Some participants mention that there was too much focus on how to gather outcomes, but, at the same time, there was lacking a collective view of how should they be applied afterwards.

Others even mentioned that, since the staff was not fully committed to the implementation, the measurement of outcomes did not help gain trust in the process. Additionally, the given importance to the measurement of costs also was presented as a drawback, because it did not allow to accomplish other steps of the Value Agenda. Interestingly, most of these factors are mentioned in the subdimensions already ranked above.

5. Discussion of Findings

Given that the quantitative analysis was not built based on the qualitative works, an effort to draw further conclusions was made based on a link between these two methods. This allowed for a more comprehensive understanding of the dimensions that providers should work on – and their respective importance - to increase their chances of successfully transitioning towards a VBHC model.

5.1 Method behind the development of the blueprint

A blueprint was developed based on the qualitative work (see Appendix 8). Here, it is to note that interviewees had no prior access to the questions and their answers were based on their thought process at the time of the interviews. The uncovered subdimensions were ranked based on several principles. First, the number of interviewees that stressed their importance was considered. In the cases in which there was a tie between the subdimensions and the number of interviewees that stressed them, the researchers in charge of the interviews debated on which should come first, following their own interpretation and sensibility to the intensity of how the subdimension was referenced by the experts. To ensure that this opinion was as unbiased as possible, the remaining member of the research team listened to the interview recordings and the same conclusions were drawn. The interview findings were then translated into bullet points that characterize the respective subdimensions found.

In parallel, a blueprint based on the quantitative analysis was developed (see Appendix 9), in which the ranking was done through the mean values of each dimension and subdimension. It is to note that this ranking was subjective to the participants' interpretation of the survey questions, which could have been misaligned with the intended meaning. Given that the survey

was built based on the literature and the first wave of interviews, there was not a perfect match between the subdimensions found on the qualitative and quantitative analyses. To resolve this, the subdimensions found on the quantitative blueprint were grouped into the subdimension found on the qualitative blueprint (e.g., the subdimensions of “Common goal, values and long-term commitment within the team,” “stakeholders interests aligned” and “a clear definition of what success looks like for the project and the team” were grouped into the subdimension “shared vision and clear definition of success”). The overall mean for the subdimensions was recalculated and the quantitative blueprint was adjusted (see Appendix 10).

Finally, the blueprint to assess readiness of VBHC implementation within health care providers (see Appendix 11) was built based on the previous ones, in which potential matches and discrepancies between subdimensions were analyzed. To reach final conclusions, a critical discussion was held, where the subdimensions were ranked according to the following criteria: if the ranking matched in both blueprints, they remained in the same position in the final blueprint and if there was a discrepancy on the ranking position, reasons for this discrepancy were evaluated and a conclusion was drawn.

5.2 Limitations

The research exposed the complexity of VBHC implementation in which numerous dimensions are necessary and reinforce each other, making it a challenging task to rank them according to importance. Although this study provided useful insights into the dimensions needed, uncovering their characterization, it presents several limitations.

Due to time constraints, both analyses were conducted simultaneously. Ideally, a study with these characteristics is conducted in the following way: the qualitative study is conducted, and its insights are analyzed. The quantitative analysis is then built based on the findings from the qualitative analysis to allow for further conclusions to be drawn. In this case, as the analysis of the interviews was finished in late November there was a limited time frame, therefore conducting both parts of the study in a sequential order was not possible as it would not allow for sufficient time to build and send the survey to the experts, provide enough time for completion and analysis.

As a result, the findings in both analyses differed, which hindered our ability to further draw accurate and objective conclusions from both analyses. This led to the necessity of having a critical debate on how to position the different subdimensions which did not match and, final conclusions were a result of our own perspective and interpretation of results. Further research on this topic is needed in a sequential order and we strongly acknowledge that the quantitative method should be re-ran and based exclusively on the findings of the qualitative analysis, to accurately rank the dimensions and respective subdimensions.

Finally, the analysis was built based on the views of a limited number of VBHC experts, meaning that the sample was not representative and, as such, the findings may not account for an accurate representation of the dimensions needed for a successful VBHC implementation. Therefore, extended research should be conducted to include a more representative sample.

5.3 Blueprint development

5.3.1 Leadership

In the qualitative analysis, experts unanimously expressed that without leadership, VBHC implementation is not possible. This was reinforced through the obtainment of the highest mean in the quantitative work, therefore being considered the most important dimension in the blueprint.

Having a *clinical champion* was considered the most important subdimension of leadership. In the qualitative research, 15 specialists stressed the importance of having a single appointed clinical leader as he/she acts as a spokesperson for the entire medical staff, without whom, a dedicated team cannot be formed. Additionally, it was consistently positioned as the highest rank (9.2 out of 10) in the quantitative work, which reiterates its importance.

Having a leader with *project management* skills came in as the second most important subdimension in the qualitative research with 14 specialists mentioning the essential need for this profile. Given that this subdimension was not found in the literature nor the first wave of interviews - on which the survey was built - it was not quantitatively measured. Therefore, this subdimension is solely ranked based on the qualitative research.

As a third subdimension, having a *dedicated VBHC team* was identified. In the qualitative research, a dedicated VBHC team was ranked as the most important. However, throughout the interviews, experts emphasized that this team builds on having a clinical leader and project manager which are imperial for success. Only having dedicated staff and doctors, for example,

will not get a project off the ground, as there is no vision, defined goals, guidance, and overall planning behind it – which are responsibilities of the clinical leader and project manager. In the quantitative analysis, this was ranked as second most important, which could be explained by the fact that the project manager subdimension was not included.

Lastly, in the qualitative research, three specialists mentioned the need for *accountability* of leadership, to keep VBHC as a priority in their daily practices. This subdimension was not part of the literature findings, and therefore not mentioned in the survey. As it came as the last factor in the qualitative research, we ranked this subdimension as fourth and last, regarding importance of leadership.

5.3.2 Organizational culture

Organizational culture was positioned at a similar level of importance which was noticeable in responses of both analyses. Having a *shared vision and a clear definition of success* was considered the most important subdimension, coming first the qualitative analysis and second on the quantitative work. Despite the mismatch in rankings, we consider this dimension should come first as the experts emphasized that it is crucial for a project to be defined by goals, values, and a clear definition of the envisioned results. Without this guidance, it becomes difficult to manage the project, which may jeopardize its success. Furthermore, its mean value on the survey did not dramatically differ from the first ranked subdimension, which suggests they are both incredibly important.

As a second subdimension, embracing *both a bottom-up and top-down approach* was identified, ranking second in the qualitative and third in the quantitative works. It is important to note that the aspect found on the survey of “governance: common topic in board meetings, ensure uniformity and guide stakeholders” - ranked in seventh place - was considered to belong in this subdimension, which lowered the overall ranking. Based on our interpretation, this aspect of governance ranked in a lower position as it is not considered a subdimension needed to implement VBHC – and participants might have thought the same way - but a consequence of having a top-down approach in which the management is dedicated and motivated about improving value. Subsequently, they can perform actions such as making VBHC as part of governance, including it in board meetings.

Speaking the same language was ranked third in importance and although not present in the quantitative works, it ranked second in the qualitative analysis as 14 interviewees found it crucial for alignment among stakeholders. Speaking the same language is a result of the previous two subdimensions as without the collaboration resulting from the bottom-up and top-down approach as well as having the same vision on what is being done, it is not possible for the people involved in the project to speak the same language. Afterwards comes *patient inclusion*, emphasized by experts as an evident dimension when stating that the voice of patients should be considered when designing and implementing a VBHC project. Patient inclusion was not mentioned in the survey; therefore, it was not possible to assess how it would be ranked next to other subdimensions.

As a fifth sub dimension, creating a *safe learning environment* was identified, being ranked in this position in the qualitative work and ranked first in the quantitative work under the names

of “promote open communication between colleagues” and “build effective relationships based on trust” which we considered to be crucial elements of creating this environment. As VBHC is about improving value for the patient, it was our understanding that patient inclusion should appear before, as including the patient in the creation process is a useful action to ensure the project objectives are in the patients’ best interest. Additionally, the survey description of this subdimension included the trust factor which had a significantly high mean that increased its overall ranking. Although we grouped trust into this subdimension, it was our understanding that trust needs to be present in all aspects of VBHC, which might justify why this subdimension was highly ranked by participants.

Frequent meetings to discuss progress was ranked sixth in importance, coming in this position in the qualitative work and fifth in the quantitative blueprint. Experts emphasized that a success factor for these meetings is the fact that staff feels comfortable discussing performance and progress, which is facilitated by the safe learning environment where the staff will not feel judged nor threatened.

Creating an *incentive structure* was identified as the next subdimension, being ranked seventh in the qualitative analysis and fourth in the quantitative work. It was our understanding from conducting the interviews that this subdimension should come at a lower position as stakeholders involved in the project should already have an intrinsic motivation to improve value. Therefore, they should want to participate in the project regardless of having incentives provided by the organization to do so. Lastly, a *shift from quantity to quality* and *enablement of resisting operators* come in eighth and ninth respectively as they were only found in the qualitative work, with relatively low engagement.

5.3.3 Knowledge

Knowledge was considered the third most important dimension, complementing leadership and the creation of the right culture, as experts referred that not possessing knowledge at the various levels mentioned throughout the qualitative analysis was an impediment for a successful implementation. Its high standard deviation in the quantitative work demonstrates how dispersed participants' perspectives were when assessing this topic. Thus, instead of measuring its relevance, the high standard deviation and lower mean in the quantitative analysis can represent the lack of clarity and understanding when interpreting the questions.

Knowledge of VBHC among all staff was ranked first in both qualitative and quantitative blueprints. Despite the high mean and being ranked second in the quantitative analysis, the subdimension *Make use of already existing programs, ways-of-working and knowledge*, was not included in the final blueprint as no interviewee mentioned it as relevant. Additionally, it gathers relevant insights from several dimensions making this subdimension too broad to be included in Knowledge.

Knowledge at the patient level was considered second, as it was ranked in this position in the qualitative analysis and third in the quantitative work, which we believe might have been the result of the misleading statement: "Invest in Patient's awareness about VBHC." This referred to educating patients regarding the benefits of VBHC, the usefulness of PROMs and how these would affect their delivery of care, and not for them to have extensive knowledge on all topics involving VBHC. This might have led some experts to consider it less important. Furthermore, throughout the interviews, experts often indicated how improving the patient knowledge was a way to increase their participation in the project, indicating the importance of this factor.

Finally, *Multidisciplinary knowledge* was ranked third, as it was ranked in this position in the qualitative works and second in the quantitative analysis. We believe the misinterpretation of the previous subdimension (ranked lower) might have also impacted how multidisciplinary knowledge was ranked (positioned higher). Furthermore, despite this knowledge being relevant for implementation – as explained in the qualitative analysis – it is our understanding that the previous subdimensions are more relevant to increase adherence and enthusiasm by both the staff and the patients.

It is to note that *transparency* and *proper care organization and delivery* were present in the original quantitative blueprint but given that these topics are extremely broad – facilitating multiple interpretations – they may be related to numerous aspects regarding the patient, clinicians, provider, among others. Due to their broadness, we decided not to include them in the final blueprint as we could not derive conclusions on how participants interpreted these aspects, nor could we allocate them to a specific subdimension. Additionally, *consistency: implementing the same model* across was not included in the final blueprint, as we considered it to be a consequence rather than a subdimension. This particular topic was found in the literature and referred to the implementation of the same VBHC model across different providers within a health care network, a result of adopting a strategy and sticking to it.

5.3.4 Data Capabilities

Data Capabilities is the final dimension and although not having automated, integrated, and structured systems is not crucial to begin implementation, these become important when aiming for scalability. This is not to say that data is not needed. Experts mentioned that not having

these capabilities should not be an impediment to start as there are alternatives such as the use of pen and paper or archaic systems.

Practicality of Data Capabilities was ranked first, coming in this position in the qualitative work and second in the quantitative analysis. Despite the divergence, experts stressed the importance of making data collection as practical as possible for the patients –which increases the chances of them filling out PROMs and engaging with clinicians. At the same time, ensuring the systems are user-friendly translates into higher engagement from the clinicians’ side.

Having a *structured data system* was ranked second, coming in this position in the qualitative analysis but fourth in the quantitative works. The lower ranking within the quantitative work could be explained by the merging between “Data and Systems integration” (ranked third in the survey) and “Limited number of IT platforms” (ranked fifth in the survey), which reduced the overall mean and decreased the weight of this subdimension.

Consistency in data was ranked third in both the qualitative and quantitative analyses, therefore, remaining in the same position in the final blueprint. *Data Capability Assessment* was ranked fourth, coming in this position in the qualitative blueprint and first in the quantitative analysis. Although reflecting on the capabilities that providers already possess is important - as it allows them to understand and leverage on existing capabilities - we considered the previous subdimensions to be more relevant as they have a direct impact on the patient and clinician engagement with the process, which experts considered to be essential.

Finally, *time accessibility* and *data analytics* were ranked in fifth and sixth respectively, as they were ranked in these positions in the qualitative blueprint. Since these were not present in the quantitative analysis, it was not possible to assess how they would be ranked next to other subdimensions.

5.3.5 Infrastructure

It is to note that regarding the dimension of infrastructure found on the survey, after careful consideration, we decided not to include it in the final blueprint for multiple reasons. First, the themes regarding this dimension were practically not mentioned throughout the interviews, which indicated that experts with implementation experience do not consider this topic to be crucial. Then, within this dimension, aspects such as *sufficient staff for support and coordination* were considered to belong to other dimensions, whereas others such as *clarity regarding availability and confidentiality measures* were too broad to draw relevant conclusions. Furthermore, the existence of *financial triggers and being financially stable* are aspects that were controversial among the two experts that mentioned these in the interviews so no relevant conclusions could be drawn. Finally, this dimension had the highest standard deviation, which indicates that experts had conflicting views. Therefore, this topic urges more investigation.

5.4 Final consideration

As mentioned above, this exercise was a product of the research team's interpretation. In the subdimensions that were not a match in both analyses, further research should be conducted to confirm the veracity of the study's discussion of findings.

6. Conclusion

This study was an attempt to uncover the dimensions needed to successfully implement Value-Based Health Care within a health care provider, arguing that when implementation fails, resistance to move towards this model increases, being essential for providers to be aware of these dimensions. Although previous literature has investigated facilitators for implementation, our analysis focused on the practicality of implementation on the ground, basing our findings on the views of experts with first-hand experience.

This analysis concluded that the dimensions of Leadership, Organizational Culture and Knowledge are essential to improve chances of a successful implementation, in which without the first two, the change to a value-based approach is extremely unlikely. Additionally, Data Capabilities were also considered significant, although not crucial to begin implementation, gaining relevance in terms of achieving scalability and facilitating the processes for both the implementation team and the patient.

Regarding leadership, it is crucial to have leaders with different profiles who guide a dedicated team with intrinsic motivation for change. This is facilitated by the culture within the organization, which should be open and allow for the safe sharing of information to generate discussions on how to improve value for the patient and the provider. Furthermore, the staff involved should be guided under the same vision, which in turn, is facilitated by the dissemination of knowledge on how VBHC will improve the existing model of care. Additionally, patient knowledge on how these programs alter the way in which their care is provided was found to be crucial to increase patient engagement, which in turn, facilitates implementation for the provider.

To summarize the findings into a comprehensive way, a blueprint that allows for the assessment of readiness for VBHC implementation within health care providers was created. This tool can provide useful insights for providers that want to assess and reflect on their readiness for implementation as it was built based on the insights of experts that were once in the same position as them and have gone through multiple projects, learning and improvement cycles. Furthermore, this blueprint can also be used by outside entities such as pharmaceutical companies or governmental bodies that may want to collaborate on a value-based model and can go through this tool to assess the readiness stage of different healthcare providers, to aid them in choosing the most suitable candidate.

Although the dimensions uncovered in this research were also present on literature, this study distinguishes itself on the subdimensions found and their respective characterization, as through the voices of experts, subdimensions such as the importance of having a project manager profile within leadership, that were not found on past literature, were uncovered. Furthermore, through this analysis we were able to characterize the subdimensions needed for a successful implementation, by grouping numerous aspects and creating a tool that will facilitate the work of those aiming to understand the factors that influence the implementation of VBHC, which previous studies have not done.

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8. Appendices

Appendix 1 – Interview guide:

1. Quick intro on our study and what their input can bring us.
2. From your personal experience, what dimensions do you consider to be most important for a successful implementation of VBHC? What is inside each dimension and from your experience, which factors are determinant for health care providers to consider?
3. What projects have you worked on where you implemented these dimensions?
4. When you started, what did you start doing? What was the first thing you did? (Specifically for people on the ground implementing).
5. When working with health care providers, what did you observe happening first, what were the things they started implementing first? (For consultants).
6. From your experience with working on different projects, do these dimensions change dramatically or do you need them for a successful implementation despite differences among projects/geographies/teams, etc.?
7. Is there anything you would like to add that we have not mentioned yet that is imperial for a successful implementation or that providers should keep in mind?
8. Based on what you have seen/experienced on the ground, do you have any recommendations on crucial elements that the health care providers should keep in mind during their process for a successful implementation?

Appendix 2 – List of experts identified for the purpose of this study:

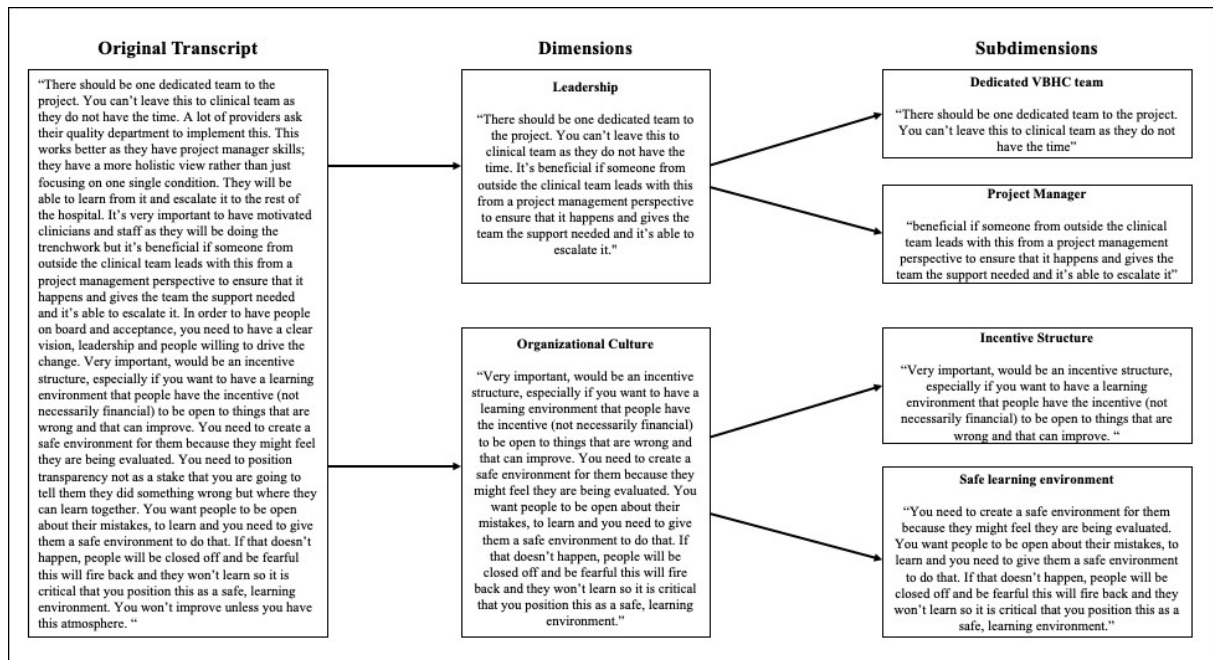
Name	Organization	Function
Samyra Keus	OLVG – City Hospital of Greater Amsterdam	Program lead VBHC
Hamish Laing	NHS Wales Swansea University	Former reconstructive plastic surgeon Medical Director and CIO Director Professor VBHC Academy
Gregory Katz	University of Paris School of Medicine VBHC Consortium EIT Health report	Professor Founding Director Academic Director
Vicky Levy	Deloitte	Global Life Sciences Sector Leader
Detlef Loppow	Martini-Klinik	Managing Director
Claudia Oliveira	Medtronics	Senior VBHC
Koen Jansen	Vintura	Principal Consultant
Dipak Kalra	Institute for Innovation through Health Data	President
Gerard Klop	Vintura	Partner
Valerie Kirchberger	Charité University Hospital	Head of VBHC
Marina Borges	IPO Porto	Head of Management and Planning Service
Morten Kildal	Uppsala University Hospital	Lead for Value-Based Health Care
Anji Kingman	Northumbria Healthcare NHS	Clinical Outcomes Manager
Carolina Watson	Vall d’Hebron Hospital	Value-Based Healthcare Outcome Manager
Vinicius Guirado	Clinics Hospital, University of São Paulo	Neurosurgeon 3 rd place winner Prémio IBRAVS
Scott Wallace	Dell Medical School, The University of Texas at Austin	Co-founder and Managing Director of the Value Institute for Health and Care
Rui Alheiro	Promptly	Board Member
Rossana Alessandrello	AQuAS	Coordinator of Innovation and Value-Based Procurement, Agency for Health Quality and Assessment (AQuAS)
Adele Cahill	Aneurin Bevan University Health Board	Programmed Director Value-Based Health Care
Marcel Hentz	University Hospital Basel	Patient Centered Management at UHB
Joaquim Murta	Faculty of Medicine of the University of Coimbra Health Cluster Portugal (VBHC)	Full Professor and former Director Board member
Erika McBride	Mayo Clinic	Regional Director, Value Based Medicine - Payer Relations at Mayo Clinic Laboratories

Jordan Schneider	Value-based Health Care Institute	CEO
José Bode-Meulepas	Catharina Hospital	VBHC Project Leader
Inge Deijle	OLVG – City Hospital of Greater Amsterdam	Project Leader VBHC
Annemieke Van Groenestijn	Maasstad Hospital	Project Lead VBHC
Claudia Hartmann	Charité University Hospital	Implementation Project Manager
Jean Paul Van Basten	Santeon	Chair of Value-based Health Care Prostate Cancer
Dr. Florian Reuter	Basel University Hospital	Leader Quality Management
Mark J. Bethke	Deloitte US	Managing Partner – Value Based Health Care Leader
Suzanne Van Lint	St. Antonius Hospital	Project Leader VBHC
Heather Peiritisch	Thomas Jefferson University Hospitals	Clinical Director, Value-based Bundle Payments
Curt Roberts	Cornerstone Health Care Group	CEO – Austin & Round Rock Branch
Maria Dikeakos	Dental Health Services Victoria	Director of VBHC Implementation
Susan McKee	Dental Health Services Victoria	CEO & Executive Director VBHC Implementation
Laurence Blosser	Central Ohio Primary Care	Chief Medical Officer
Carl Savage	New Karolinska Hospital	Researcher & Teacher

Appendix 3 – List of VBHC experts interviewed:

Name	Organization	Function	Country	Interviewer
Gerard Klop	Vintura	Partner	NL	M ^a Carmo Batalha Reis Neto
Koen Jansen	Vintura	Principal Consultant	NL	Marie Eva Debruyne
Hamish Laing	NHS Wales Swansea University	Former reconstructive plastic surgeon Medical Director and CIO Director Professor VBHC Academy	UK	M ^a Carmo Batalha Reis Neto
Dipak Kalra	I-hd.eu	President	BE	Marie Eva Debruyne
Mark Bethke	Deloitte USA	Managing Director	US	Marie Eva Debruyne
Vinicius Guirado	Clinics Hospital, University of São Paulo	Neurosurgeon 3 rd place winner Prémio IBRAVS	BR	M ^a Carmo Batalha Reis Neto
Annemieke Van Groenestijn	Maasstad Ziekenhuis	Project lead	NL	Marie Eva Debruyne
Marina Borges	IPO Porto	Head of Management and Planning Service	PT	M ^a Carmo Batalha Reis Neto
Rik Renard	Awel Health	Customer success manager	BE	Marie Eva Debruyne
Anji Kingman	Northumbria Health Care NHS	Clinical Outcomes Manager	UK	M ^a Carmo Batalha Reis Neto
Hans Martens	EIT Health	Member of advisory board	DK	Marie Eva Debruyne
Sally Lewis	NHS Wales	National Clinical Director for VBHC	UK	M ^a Carmo Batalha Reis Neto
Andrea Srur	Value4health ICHOM	Founder & CEO of Value4health Former ICHOM implementation team	UK	M ^a Carmo Batalha Reis Neto
Cesar Abicalaffe	2iM Inteligencia Médica IBRAVS	President & CEO President	BR	M ^a Carmo Batalha Reis Neto
Alba Nicolás Boluda	Oneclinic	Head of Value	FR	Marie Eva Debruyne
Marcia Pinheiro	CASSI	Health Manager 1 st place winner Prémio IBRAVS	BR	M ^a Carmo Batalha Reis Neto
Jacob Lippa	Providence	Senior Manager, Clinical analytics	USA	Marie Eva Debruyne
Karl Sanchez	Athena Health	Onboarding Project Lead, Virtual Athena One Implementation	USA	Marie Eva Debruyne
Kathleen Carberry	Value Institute for Health and Care at Dell Medical School	Outcomes program officer	US	First wave of interviews
Glyn Jones	Aneurin Bevan University Health Board	Director for Finance & Procurement	UK	First wave of interviews
Jan Hazelzet	Erasmus University Rotterdam	Professor in health care quality and outcome	NL	First wave of interviews
Diane Bell	Oxford Centre for Triple Value healthcare	Senior Advisor	UK	First wave of interviews
Shalika Hegde Sue McKee Deborah Cole	Dental Health Services Victoria	Administration	AU	First wave of interviews
Francisco Rocha Gonçalves	Luz Saúde	Director Healthcare Technologies Management	PT	First wave of interviews
Filipe Costa	Luz Saúde	Head of VBHC	PT	First wave of interviews

Appendix 4 – Qualitative content analysis example:



Appendix 5 - Survey structure:

1) INTRODUCTORY MESSAGE

This survey aims to understand the prerequisites a health care provider must have to ensure that the implementation of Value-Based Health Care will be successful and what prerequisites are more critical.

All answers will remain anonymous. The data collected will only be used in this study. The survey should take no more than 5 minutes to complete. Thank you so much for your cooperation.

Your opinion is of great value to us.

A – SUCCESS DETERMINANTS

Q1. On a scale from 0-10, how important are the following determinants for a successful Value-Based Health Care implementation in hospital

- a) Motivation and enthusiasm within the team.
- b) Clear leadership structure.
- c) A leader with a project management / consultancy profile that deals with the day to day of the project, engaging all necessary stakeholders
- d) A clinical leader within the medical field that can act as a spokesperson for the clinical staff
- e) Access to a VBHC team that provides support and guidance.
- f) Effective relationships based on trust

- g) Common goal, values, and long-term commitment within the team
- h) A clear definition of what success looks like for the project and the team
- i) Stakeholders interests aligned
- j) Constant feedback
- k) Transparency
- l) Consistency: implementing the same model across
- m) Create an incentive structure that aligns stakeholders interests
- n) Regular staff meetings
- o) Proper care organization and delivery
- p) Multidisciplinary collaboration
- q) Governance: common topic in board meetings, ensure uniformity and guide stakeholders
- r) Create a safe learning environment and a continuous improvement cycle.
- s) Support from the executive board.
- t) Promote open communication among colleagues

- u) Value-Based Health Care training for all staff involved in the project (clinical staff, board members and managers, etc).
- v) Invest in patient's awareness about VBHC
- w) Patient's care pathway understanding
- x) Make use of already existing programs, ways-of-working and knowledge.
- y) Promotion of skill acquisition that go beyond their functions (Management, Clinical and Health Information System)

- z) Limited number of shared IT platforms
 - aa) Existence of common standards for tracking treatments, costs, and outcomes at patient level
 - bb) Systems and capabilities within health care IT that allow for collection and sharing of outcome data and information broadly across clinicians and the public
 - cc) Practical systems that are easy to access and comprehend.
 - dd) Data and systems integration.
 - ee) Leverage of existing data.

 - ff) Clarity regarding availability and confidentiality measures.
 - gg) Existence of financial triggers to boost VBHC implementation
 - hh) Being financially stable
 - ii) Sufficient staff for support and coordination

Q2. Are you aware of examples of bad VBHC implementations?

- a. Yes
- b. No

Q3. If yes. Could you summarize why they were bad? (open question)

B – DEMOGRAPHICS

Q4. Indicate your gender at birth.

- a. Female
- b. Male
- c. Prefer not to say.

Q5. Indicate your country of birth. [Country]

Q6. Indicate your age group.

- a. Under 18
- b. 19 - 24
- c. 25 - 34
- d. 35 - 44
- e. 45 - 54
- f. 55 - 64
- g. Above 64

Q7. Highest attained education

- a. Bachelor's degree
- b. Master's degree
- c. PHD
- d. Post PHD

Q8. Is your current occupation related to Value-Based Health Care?

Yes or No

Q9. Which, from below, is your current occupation? (multiple question)

- a. Researcher
- b. University Professor
- c. Clinical Head of a Hospital Service
- d. Medical Doctor
- e. Member of the Executive Board of the Hospital
- f. Hospital Manager
- g. Management Consultant
- h. IT Staff in a Hospital
- i. IT Consultant
- j. Head of VBHC in a Hospital
- k. VBHC Project Manager
- l. Other (fill the box)

Q10. How long have you been in your current occupation?

- a. Less than 1 year
- b. From 1 to 5 years
- c. From 6 to 10 years
- d. More than 10 years

Q11. How many years of experience you have in total?

- a. Less than 1 year
- b. From 1 to 5 years
- c. From 6 to 10 years
- d. From 11 to 15 years
- e. From 16 to 20 years
- f. More than 20 years

Q12. Indicate in which countries you working on VBHC.

C – VBHC Knowledge

Q13. Where did you first find out about VBHC?

- a. Conference
- b. Scientific Journal
- c. Company where you were working
- d. University
- e. Other.

Q14. Have you studied VBHC?

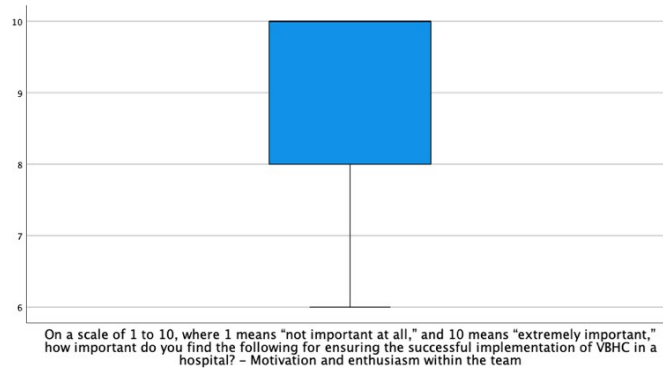
- a. Yes
- b. No

Q14. If yes, please specify the institution

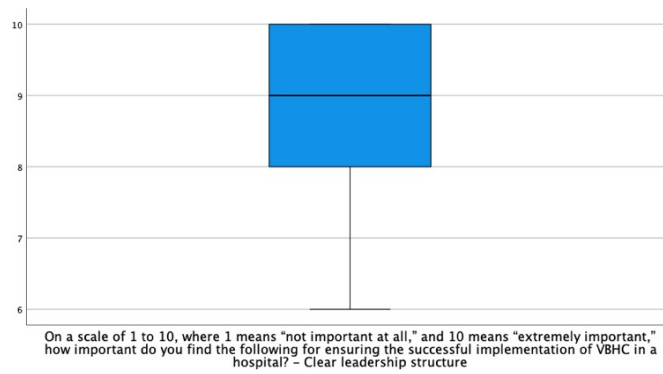
- a) Nova University Lisbon
- b) Harvard University
- c) University of Texas at Austin
- d) University of Paris
- e) Erasmus University Rotterdam
- g) Other

Appendix 6 - Subdimensions Box-Plots:

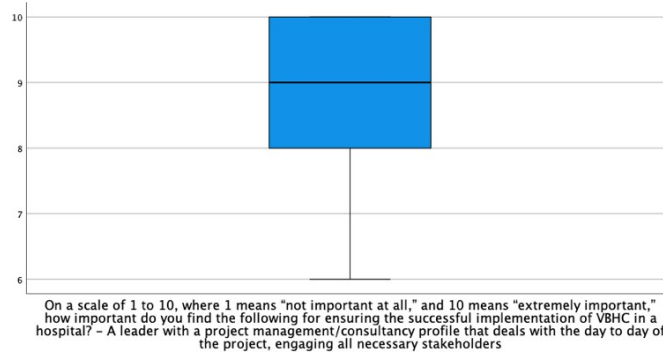
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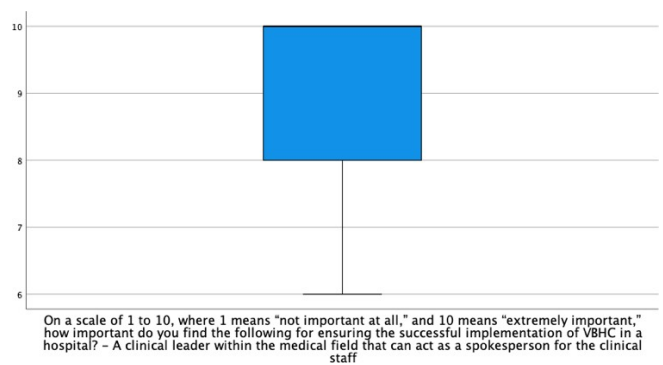
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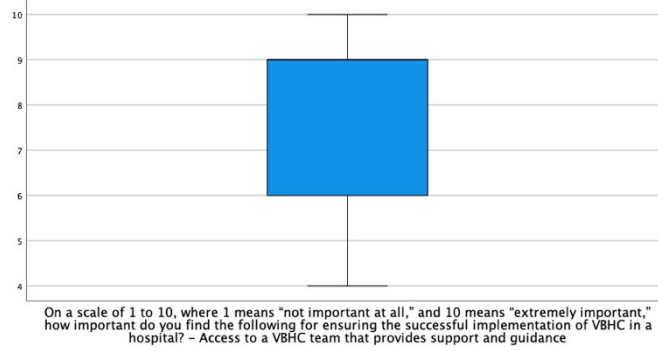
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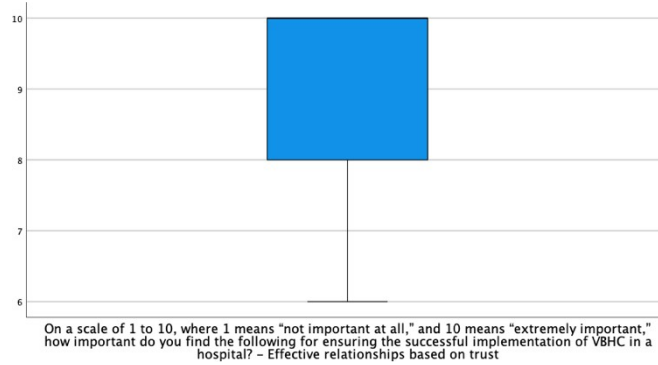
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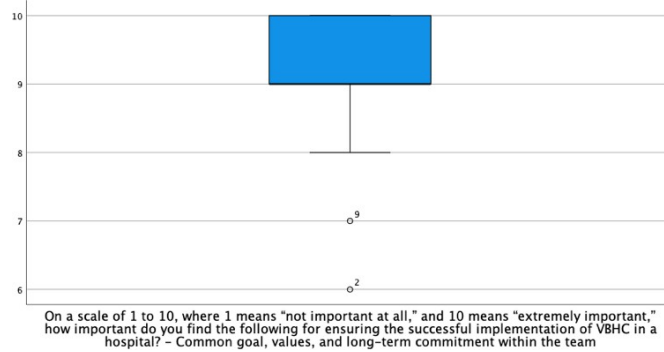
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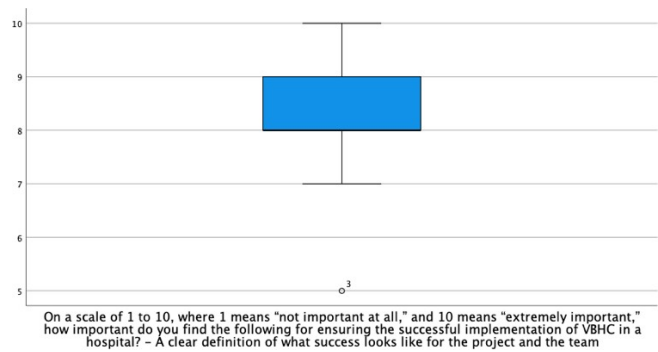
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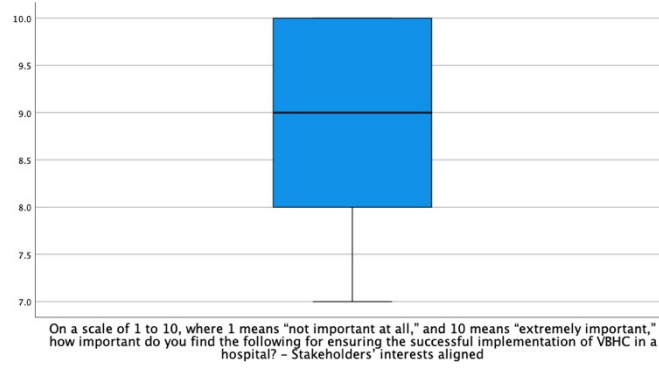
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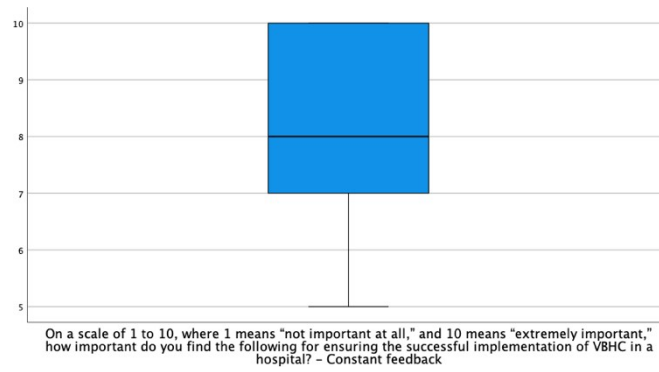
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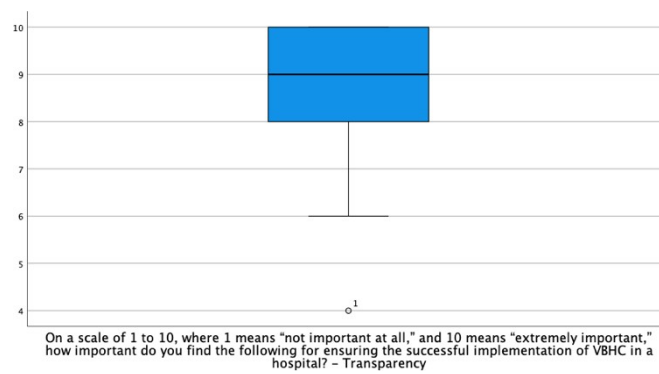
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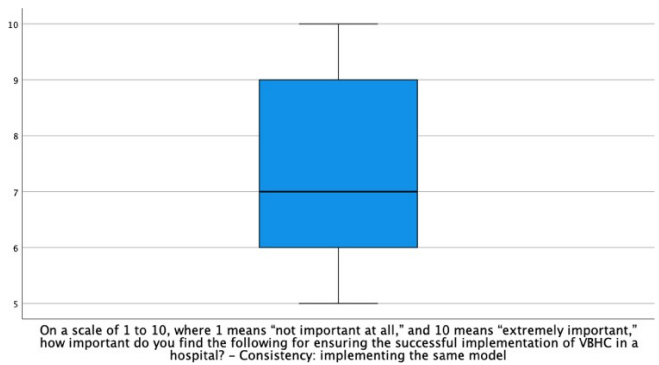
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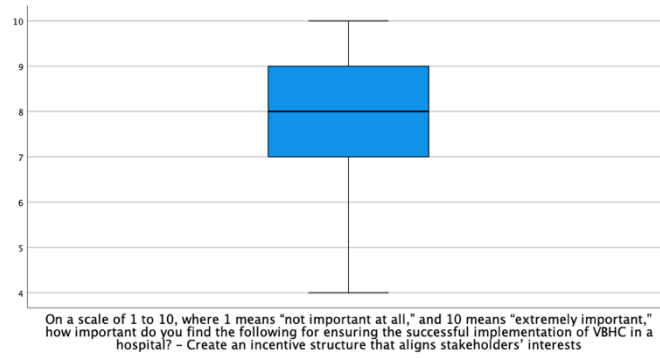
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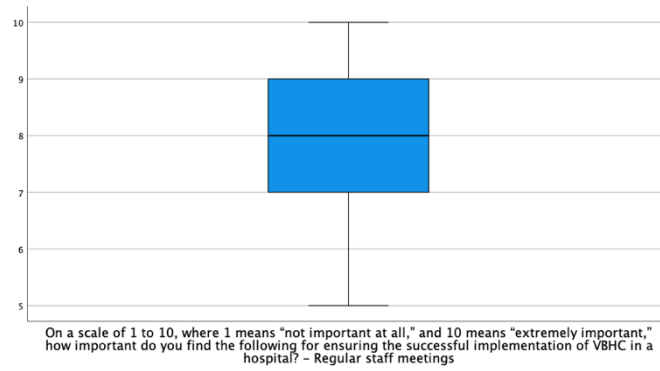
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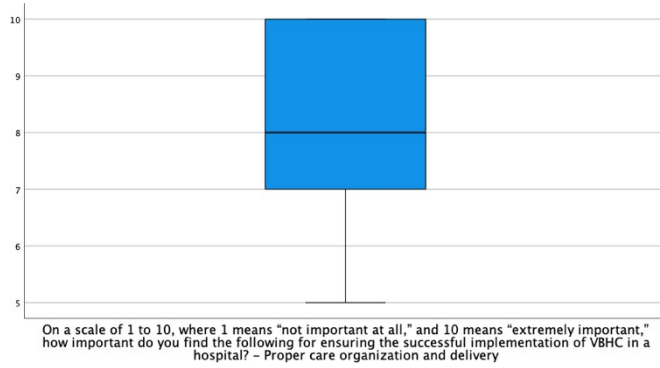
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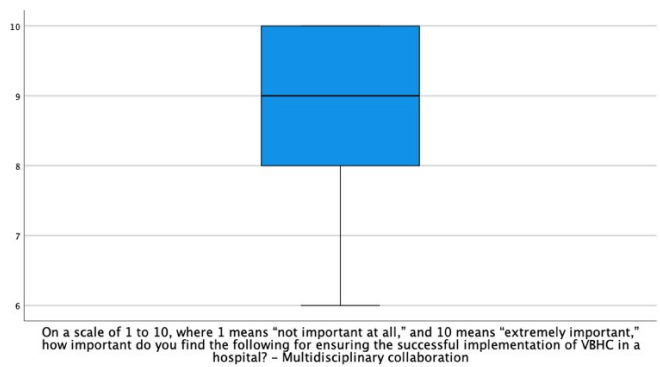
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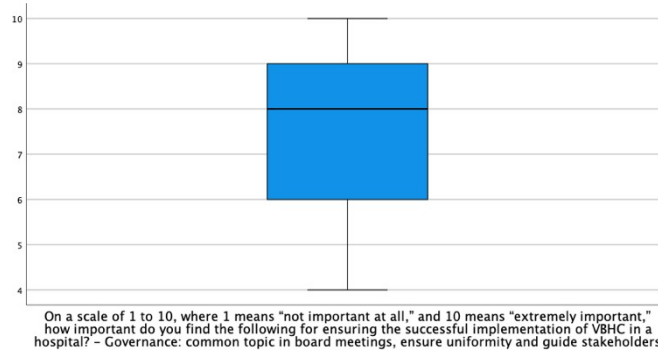
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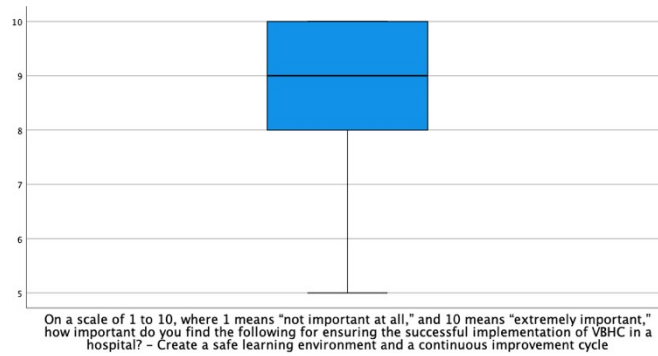
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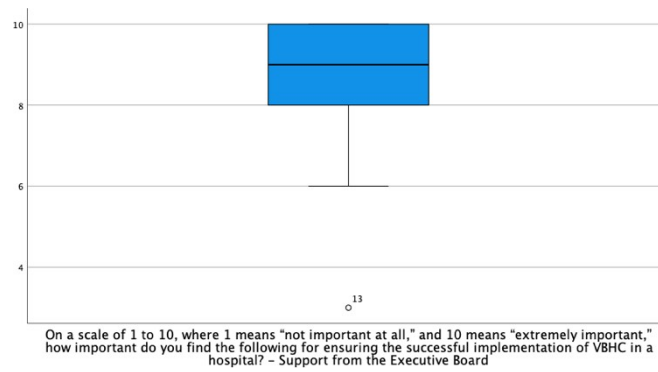
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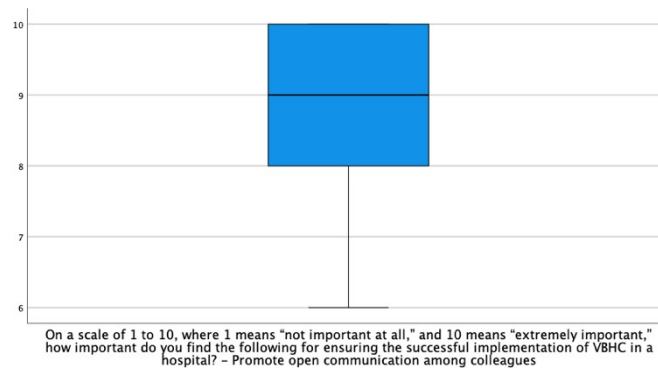
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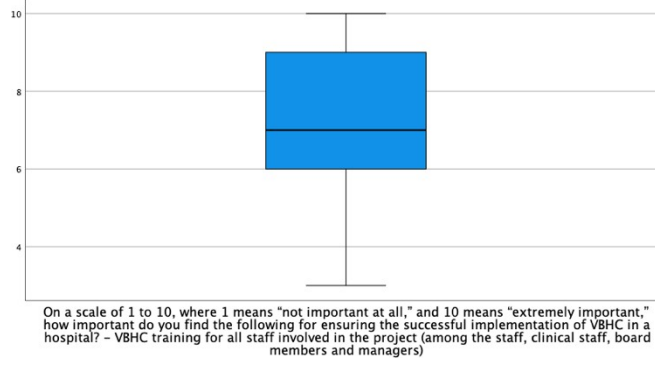
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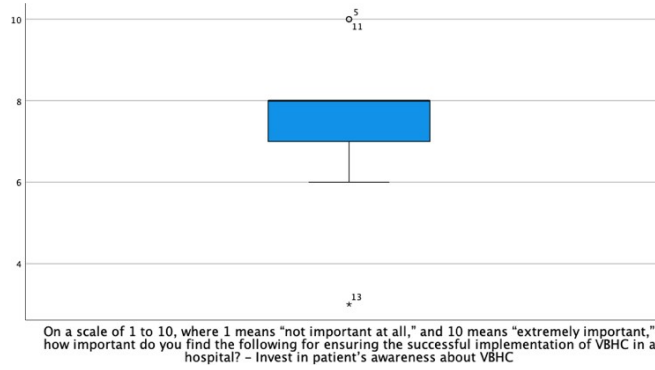
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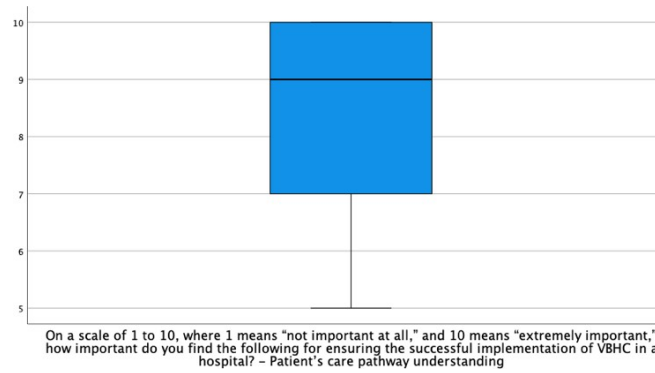
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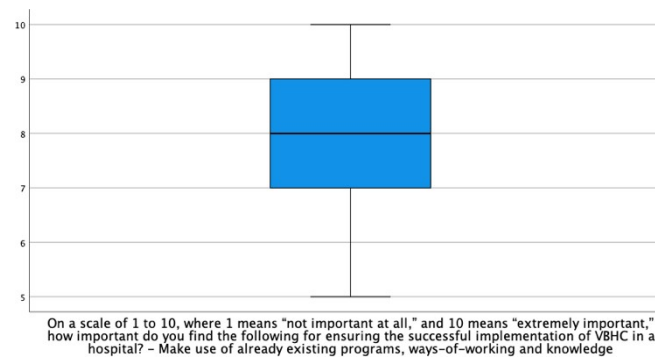
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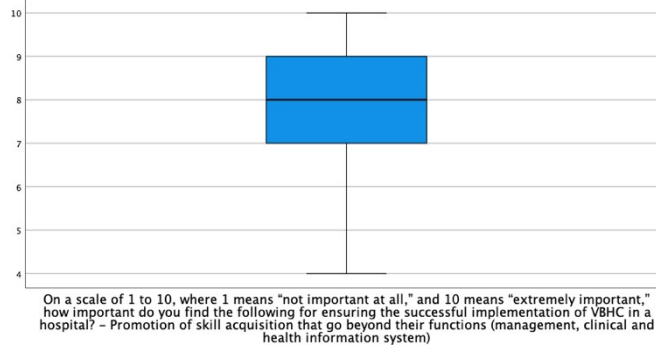
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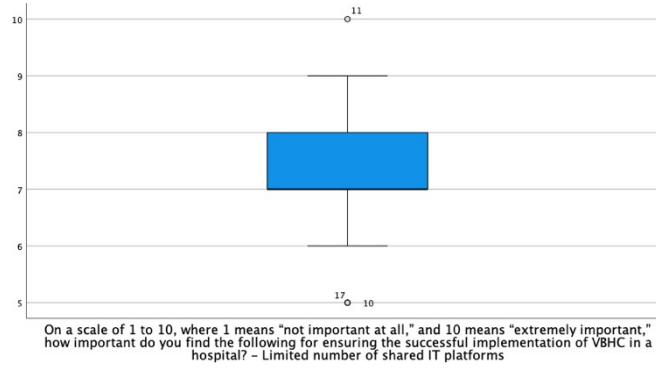
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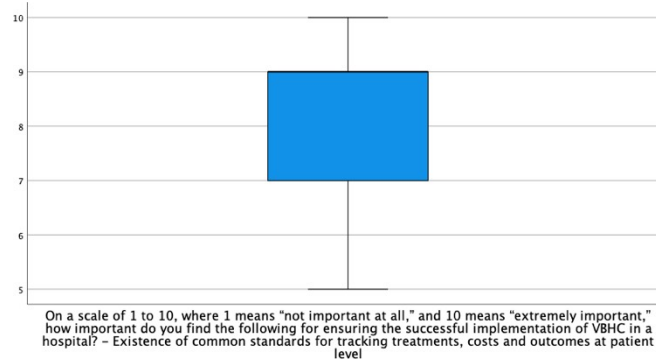
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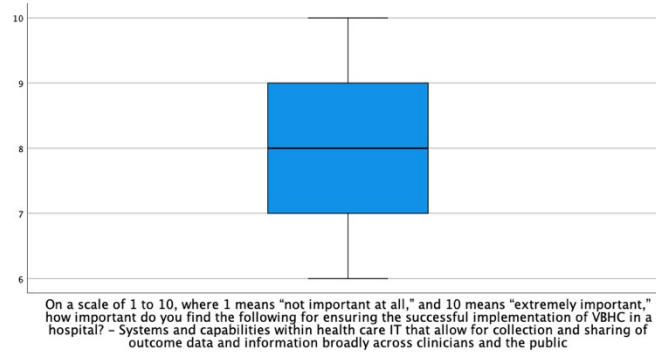
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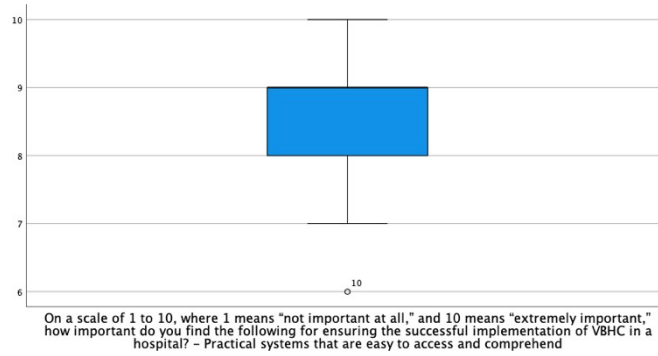
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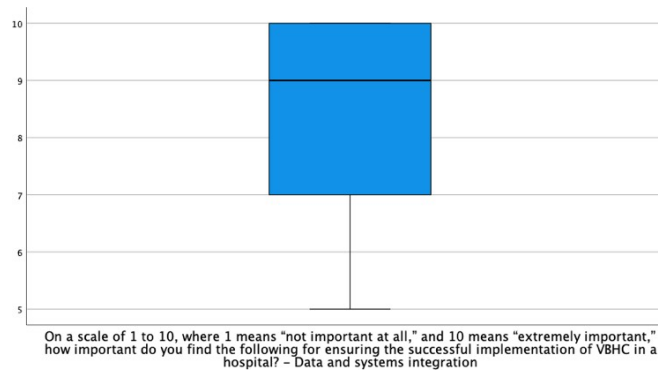
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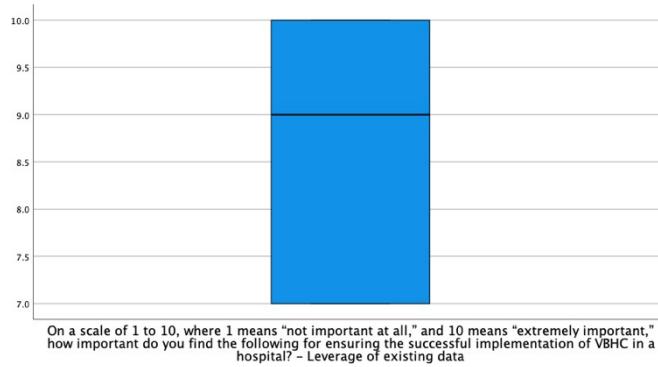
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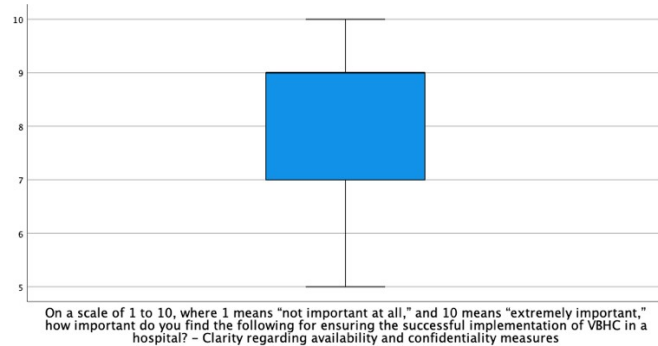
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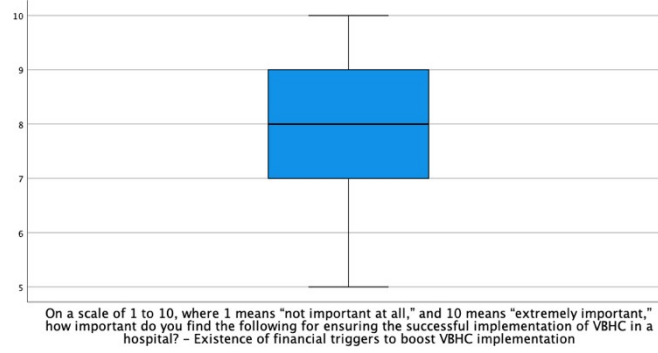
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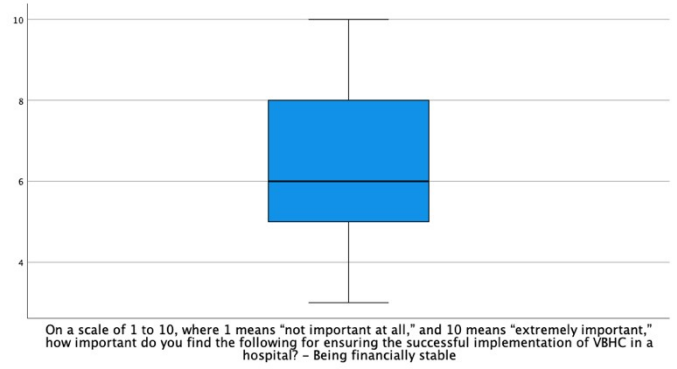
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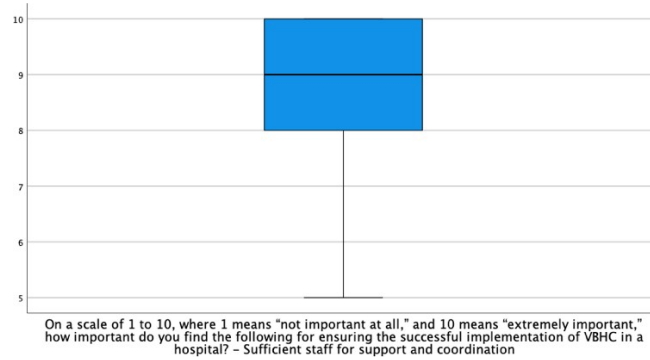
6 gg)



6 hh)



6 ii)



Appendix 7 – Dimensions and Subdimensions Ranking (with and without Outliers):

Dimension/ Subdimension	Mean (with outliers)	Standard Deviation	Rank	Mean (without outliers)	Standard Deviation	Rank	N° of Outliers
Leadership	8.75	1.48	1	8.75	1.48	1	-
A clinical leader within the medical field that can act as a spokesperson for the clinical staff	9.12	1.36	1	9.12	1.36	1	-
Motivation and enthusiasm within the team.	8.94	1.48	2	8.94	1.48	2	-
Effective relationships based on trust	8.88	1.47	3	8.88	1.47	3	-
Clear leadership structure.	8.82	1.33	4	8.82	1.33	4	-
A leader with a project management / consultancy profile that deals with the day to day of the project, engaging all necessary stakeholders	8.76	1.35	5	8.76	1.35	5	-
Access to a VBHC team that provides support and guidance.	8	1.84	6	8	1.84	6	-
Organizational Culture	8.26	1.57	2	8.33	1.52	2	5
Common goal, values, and long-term commitment within the team	8.94	1.14	1	9.26	0.70	1	2
Multidisciplinary collaboration	8.82	1.24	2	8.82	1.24	2	-
Stakeholders interests aligned	8.65	1.22	3	8.65	1.22	5	-
Support from the executive board.	8.47	1.87	4	8.81	1.28	3	1
Promote open communication between colleagues	8.47	1.37	4	8.47	1.37	7	-
Transparency	8.41	1.77	5	8.69	1.40	4	1
A clear definition of what success looks like for the project and the team	8.29	1.26	6	8.50	0.97	6	1
Constant feedback	8.18	1.63	7	8.18	1.63	8	-
Proper care organization and delivery	8.00	1.70	8	8.00	1.70	9	-

Create an incentive structure that aligns stakeholders interests	7.94	1.78	9	7.94	1.78	10	-
Governance: common topic in board meetings, ensure uniformity and guide stakeholders	7.82	1.74	10	7.82	1.74	11	-
Regular staff meetings	7.76	1.71	11	7.76	1.71	12	-
Consistency: implementing the same model across	7.53	1.66	12	7.53	1.66	13	-
Knowledge	7.74	1.68	5	7.74	1.59	5	3
Patient's care pathway understanding	8.35	1.62	1	8.35	1.62	1	-
Make use of already existing programs, ways-of-working and knowledge.	7.94	1.43	2	7.94	1.43	2	-
Promotion of skill acquisition that go beyond their functions (Management, Clinical and Health Information System)	7.53	1.74	3	7.53	1.74	3	-
Value-Based Health Care training for all staff involved in the project (clinical staff, board members and managers, etc).	7.47	1.97	4	7.47	1.97	4	-
Invest in patient's awareness about VBHC	7.41	1.58	5	7.36	0.74	5	3
Data Capabilities	8.24	1.40	3	8.31	1.32	3	4
Leverage of existing data.	8.53	1.33	1	8.53	1.33	2	-
Practical systems that are easy to access and comprehend.	8.53	1.23	1	8.69	1.08	1	1
Data and systems integration.	8.41	1.54	2	8.41	8.53	3	-
Systems and capabilities within health care IT that allow for collection and sharing of outcome data and information broadly across clinicians and the public	8.35	1.27	3	8.35	1.27	4	-

Existence of common standards for tracking treatments, costs, and outcomes at patient level	8.18	1.47	4	8.18	1.47	5	-
Limited number of shared IT platforms	7.41	1.42	5	7.57	1.02	6	3
Infrastructures	7.76	1.75	4	7.76	1.75	4	-
Sufficient staff for support and coordination	8.47	1.42	1	8.47	1.42	1	-
Clarity regarding availability and confidentiality measures.	8.12	1.62	2	8.12	1.62	2	-
Existence of financial triggers to boost VBHC implementation	7.65	1.62	3	7.65	1.62	3	-
Being financially stable	6.82	1.98	4	6.82	1.98	4	-

Appendix 8 – Qualitative blueprint:

	Sub dimension	Characterization	# Of mentions
Leadership	Dedicated VBHC Team	<p>A group of staff within the team from different disciplines, including managerial, clinical, IT, among others that are found relevant</p> <p>Consider a Multi-hat structure – operators that involve and represent their respective disciplines to ensure engagement of all stakeholders</p> <p>Develop a smooth flow between the dedicated VBHC team and non-VBHC operators within the provider</p> <p>Have tenured representation within the VBHC team, which facilitates trust</p>	18
	Clinical Champion	<p>One chosen clinical champion that engages all medical stakeholders</p> <p>A leader that is a spokesperson for the VBHC project among the medical community</p> <p>A leader that has positive reputation within the health care provider, well respected</p> <p>A leader that is passionate, inspirational, and visionary – believing in and pushing for VBHC</p>	15
	Project Manager	<p>One chosen non-medical profile with project management skills that engages all stakeholders of the dedicated VBHC team</p> <p>Management of stakeholders</p> <p>Designs scale and scope of project, manages daily assignments, tracks workstreams such as data collection and analysis of outcomes</p> <p>Addresses barriers to facilitate implementation processes among the different workstreams</p>	14
	Accountability	<p>Keep leadership accountable to prioritize VBHC implementation</p> <p>Consider Key Performance Indicators (KPIs) to track performance and progress of involved team</p>	3
Organizational Culture	Shared vision and clear definition of success	<p>Define clear objectives and timeline (short-term and long-term)</p> <p>Define what does success look like for this project</p> <p>Members of involved team need to be committed and share ambition of improving value for the patient</p> <p>Define which stakeholders should be involved and attribute them clear functions</p> <p>Create awareness for the challenges that will emerge and the need for continuous improvement</p> <p>Manage expectations within team involved (e.g., despite quick wins, benefits are often visible long-term)</p>	20
	Speaking the Same Language	<p>Define what value means for the project and make sure people involved agree with this definition</p> <p>People involved in the project are on the same page regarding the steps being taken in the distinct phases of the project</p> <p>Build relationships of trust among management and clinical staff, making sure the staff feels supported by management</p>	14
	Bottom-up and top-down approach	<p>Managerial presence in the process that clears barriers, provides resources, and supports implementation team</p> <p>Managerial presence with intrinsic motivation for change towards VBHC</p> <p>Team engaged in the process, with motivation to create value for the patients</p>	12
	Patient Inclusion	<p>Patient involvement in the creation of the VBHC project</p> <p>Patient involvement in the project design (e.g., giving their opinions on how they would envision their care being provided or giving feedback on what determinants and outcomes matter to them)</p> <p>Patients sharing their experience within patient groups to improve patient engagement</p>	12
	Safe Learning Environment	<p>Hold meetings where progress can be discussed among clinicians, encouraging sharing of information</p> <p>Hold meetings where concerns can be discussed between clinicians, project management and higher management</p>	11

		Educate implementation team on the purpose of sharing outcomes so they view this as a value improvement mechanism and not an assessment tool	
	Frequent meetings to discuss progress	Hold meetings with VBHC team to discuss project, goals, position, and future steps Open space for questions and suggestions Review cases and discuss results Look at outcome data together Conduct literature reviews on work being done among researchers and other providers to improve current solutions and assess alternatives	9
	Incentive structure	Create incentives for each stakeholder to want to be involved in the project: Survey involved staff and patients to assess what incentivizes their participation, what motivates them and what they hope to achieve	9
	Shift from quantity to quality	Consider shifting evaluation formats from quantitative methods to a more qualitative approach that focuses on elements such as listening to patients' experiences and how clinicians and remaining staff create value for them Provide clinicians with reassurance and feedback that allows them to think and act according to value-based models	5
	Enablement of Resisting Operators	Be aware of resistance to VBHC model Survey provider to assess which staff is willing to change towards VBHC and leverage on those members Communicate projects and results to show the potential and benefits of VBHC to resisting operators within the provider	2
Knowledge	Knowledge on VBHC among all staff involved	Implement a VBHC education system within the provider (include it in mandatory training) Hold seminars with external experts on VBHC Educate dedicated team on the value of VBHC, the benefits, relevance, reason to implement it and respective steps Ensure alignment, through education, on the current state of care delivery and how VBHC will change that	18
	Knowledge at the patient level	Patient education on benefits, relevance, goals, and effects of VBHC Patient education on effect of VBHC on their care Patient education on the collection and usefulness of PROMs Patient education on how VBHC has affected care delivery in other providers	12
	Multidisciplinary knowledge	Provide team involved with multidisciplinary knowledge on areas outside of their expertise (e.g., team working skills, data analysis, project management, etc) Offer joint-training programs that allows stakeholders to learn how to work as part of a multidisciplinary team	10
Data Capabilities	Practicality of Data capabilities	The practicality of data collection: Simple, concise, and engaging surveys Ensure that patients see the same clinicians, to avoid filling out duplicate surveys Ensure patient voice is taken into consideration regarding data collection, it might differ depending on condition User-friendly/automated IT systems Easy, navigable IT system (e.g., high visualization of data, clean dashboard design) Automated processes, which reduce extra work for involved staff and patients (e.g., automated reminder for patients to complete follow-up surveys)	20
	A structured and integrated digital data collection system	Be aware that small pilots can take off without a data collection system, but it is needed for scalability Ensure IT system is integrated with already existing hospital systems such as Electronic Health Records (EHR), to avoid duplicate entries Consider possible integration challenges when using external IT system vendors (e.g., confidential data exposure to external parties)	18
	Consistency in data (use of standard sets)	Ensure the use of consistent data measurements such as standard sets to ensure data is comparable among clinicians and providers Strictly define data sets to be collected prior to implementation	15

	Data capability assessment	Assess what data is already being collected (regarding outcomes and costs) and consider a disease pathway for which there is a history a data within the provider Assess where value can be extracted regarding existing capabilities, leveraging them	10
	Timely accessibility of data	Quick access to outcome data to ensure accurate representation of the patients' reality Fast translation of entry data points into results analysis, which allow clinicians to visualize data in real time	10
	Data analytics	Data analytic experts within VBHC team Analytics team that benchmarks data and translates it into comprehensive dashboards	7

Appendix 9 – Quantitative blueprint:

	Survey Description	Mean
Leadership	A clinical leader within the medical field that can act as a spokesperson for the clinical staff	9.12
	Motivation and enthusiasm within the team	8.94
	Effective relationships based on trust	8.88
	Clear Leadership structure	8.82
	A leader with a project management / consultancy profile that deals with the day to day of the project, engaging all necessary stakeholders	8.76
	Access a VBHC team that provides support and guidance.	8.00
Organizational Culture	Common goal, values, and long-term commitment within the team.	8.94
	Multidisciplinary collaboration	8.82
	Stakeholders' interests aligned	8.65
	Support from the executive Board	8.47
	Promote open communication between colleagues	8.47
	Transparency	8.41
	A clear definition of what success looks like for the project and the team.	8.29
	Constant Feedback	8.18
	Proper Care Organization and Delivery	8.00
	Create an incentive structure that aligns stakeholders' interests	7.94
	Governance: common topic in board meetings, ensure uniformity and guide stakeholders	7.82
	Regular staff meetings	7.76
	Consistency: implementing the same model across	7.53
	Knowledge	Patient's care pathway understanding
Make use of already existing programs, ways-of-working and knowledge		7.94
Promotion of skill acquisition that go beyond their functions (Management, Clinical and Health Information System)		7.53
Value-Based Health Care training for all staff involved in the project (clinical staff, board members and managers, etc)		7.47
Invest in patient's awareness about VBHC		7.41
Data Capabilities	Leverage of existing data.	8.53
	Practical Systems & Systems and Capabilities	8.53
	Data and systems integration	8.41
	Systems and capabilities within health care IT that allow for collection and sharing of outcome data and information broadly across clinicians and the public	8.35
	Existence of common standards for tracking treatments, costs, and outcomes at patient level	8.18
	Limited Number of IT shared Platforms;	7.41

Appendix 10 – Altered Quantitative blueprint with merged sub dimensions:

	Sub dimension	Survey Description	Mean
Leadership	Clinical Champion	A clinical leader within the medical field that can act as a spokesperson for the clinical staff	9.12
	Project Manager	A leader with a project management / consultancy profile that deals with the day to day of the project, engaging all necessary stakeholders	8.76
	Dedicated VBHC Team	Motivation and enthusiasm within the team. Access to a VBHC team that provides support and guidance. Multidisciplinary collaboration Clear Leadership structure	8.62
Organizational Culture	Safe Learning Environment	Promote open communication between colleagues Effective relationships based on trust	8.68
	Shared vision and clear definition of success	Common goal, values, and long-term commitment within the team Stakeholders' interests aligned A clear definition of what success looks like for the project and the team	8.63
	Bottom-up and top-down approach	Support from the executive Board Governance: common topic in board meetings, ensure uniformity and guide stakeholder	8.14
	Incentive Structure	Create an incentive structure that aligns stakeholders' interests	8.00
	Frequent meetings to discuss progress	Constant Feedback Regular staff meetings	7.97
Knowledge	Knowledge on VBHC among all staff involved	Value-Based Health Care training for all staff involved in the project Patient's care pathway understanding	7.91
	Multidisciplinary knowledge	Promotion of skill acquisition that go beyond their functions (Management, Clinical and Health Information System)	7.53
	Knowledge at the patient level	Invest in patient's awareness about VBHC	7.41
Data Capabilities	Data Capability Assessment	Leverage of existing data	8.53
	Practicality of data capabilities	Practical Systems & Systems and Capabilities Systems and capabilities within health care IT that allow for collection and sharing of outcome data and information broadly across clinicians and the public	8.44
	Consistency in data (use of standard sets)	Existence of common standards for tracking treatments, costs, and outcomes at patient level	8.18
	Structured Data Collection System	Data and systems integration Limited Number of IT shared Platforms	7.91

Appendix 11 - A blueprint to assess readiness of value-based health care within healthcare providers:

	Subdimension	Characterization
Leadership	Clinical Champion	<p>One chosen clinical champion that engages all medical stakeholders</p> <p>A leader that is a spokesperson for the VBHC project among the medical community</p> <p>A leader that has positive reputation within the health care provider, well respected</p> <p>A leader that is passionate, inspirational, and visionary – ultimately believing and pushing for VBHC</p>
	Project Manager	<p>One chosen non-medical profile with project management skills that engages all stakeholders of the dedicated VBHC team</p> <p>Management of stakeholders</p> <p>Designs scale and scope of project, manages daily assignments, tracks workstreams such as data collection and analysis of outcomes</p> <p>Addresses barriers to facilitate implementation processes among the different workstreams</p>
	Dedicated VBHC Team	<p>A group of staff within the team from different disciplines, including managerial, clinical, IT, among others that are found relevant</p> <p>Consider a Multi-hat structure – operators that involve and represent their respective disciplines to ensure engagement of all stakeholders</p> <p>Develop a smooth flow between the dedicated VBHC team and non-VBHC operators within the provider</p> <p>Have tenured representation within the VBHC team, which facilitates trust</p>
	Accountability	<p>Keep leadership accountable to prioritize VBHC implementation</p> <p>Consider Key Performance Indicators (KPIs) to track performance and progress of involved team</p>
Organizational Culture	Shared vision and clear definition of success	<p>Define clear objectives and timeline (short-term and long-term)</p> <p>Define what does success look like for this project</p> <p>Members of involved team need to be committed and share ambition of improving value for the patient</p> <p>Define which stakeholders should be involved and attribute them clear functions</p> <p>Create awareness for the challenges that will emerge and the need for continuous improvement</p> <p>Manage expectations within team involved (e.g., despite quick wins, benefits are often visible long-term)</p>
	Bottom-up and top-down approach	<p>Managerial presence in the process that clears barriers, provides resources, and supports implementation team</p> <p>Managerial presence with intrinsic motivation for change towards VBHC</p> <p>Team engaged in the process, with motivation to create value for the patients</p>
	Speaking the Same Language	<p>Define what value means for the project and make sure people involved agree with this definition</p> <p>People involved in the project are on the same page regarding the steps being taken in the distinct phases of the project</p> <p>Build relationships of trust among management and clinical staff, making sure the staff feels supported by management</p>
	Patient Inclusion	<p>Patient involvement in the creation of the VBHC project</p> <p>Patient involvement in the project design (e.g., giving their opinions on how they would envision their care being provided or giving feedback on what determinants and outcomes matter to them)</p> <p>Patients sharing their experience within patient groups to improve patient engagement</p>
	Safe Learning Environment	<p>Hold meetings where progress can be discussed among clinicians, encouraging sharing of information</p> <p>Hold meetings where concerns can be discussed between clinicians, project management and higher management</p> <p>Educate implementation team on the purpose of sharing outcomes so they view this as a value improvement mechanism and not an assessment tool</p>

	Frequent meetings to discuss progress	<p>Hold meetings with VBHC team to discuss project, goals, position, and future steps</p> <p>Open space for questions and suggestions</p> <p>Review cases and discuss results</p> <p>Look at outcome data together</p> <p>Conduct literature reviews on work being done among researchers and other providers to improve current solutions and assess alternatives</p>
	Incentive structure	<p>Create incentives for each stakeholder to want to be involved in the project:</p> <p>Survey involved staff and patients to assess what incentivizes their participation, what motivates them and what they hope to achieve</p>
	Shift from quantity to quality	<p>Consider shifting evaluation formats from quantitative methods to a more qualitative approach that focuses on elements such as listening to patients' experiences and how clinicians and remaining staff create value for them</p> <p>Provide clinicians with reassurance and feedback that allows them to think and act according to value-based models</p>
	Enablement of Resisting Operators	<p>Be aware of resistance to VBHC model</p> <p>Survey provider to assess which staff is willing to change towards VBHC and leverage on those members</p> <p>Communicate projects and results to show the potential and benefits of VBHC to resisting operators within the provider</p>
Knowledge	Knowledge on VBHC among all staff involved	<p>Implement a VBHC education system within the provider (include it in mandatory training)</p> <p>Hold seminars with external experts on VBHC</p> <p>Educate dedicated team on the value of VBHC, the benefits, relevance, reason to implement it and respective steps</p> <p>Ensure alignment, through education, on the current state of care delivery and how VBHC will change that</p>
	Knowledge at the patient level	<p>Patient education on benefits, relevance, goals, and effects of VBHC</p> <p>Patient education on effect of VBHC on their care</p> <p>Patient education on the collection and usefulness of PROMs</p> <p>Patient education on how VBHC has affected care delivery in other providers</p>
	Multidisciplinary knowledge	<p>Provide team involved with multidisciplinary knowledge on areas outside of their expertise (e.g., team working skills, data analysis, project management, etc)</p> <p>Offer joint-training programs that allows stakeholders to learn how to work as part of a multidisciplinary team</p>
Data Capabilities	Practicality of Data capabilities	<p>The practicality of data collection:</p> <p>Simple, concise, and engaging surveys</p> <p>Ensure that patients see the same clinicians, to avoid filling out duplicate surveys</p> <p>Ensure patient voice is taken into consideration regarding data collection, it might differ depending on condition</p> <p>User-friendly/automated IT systems</p> <p>Easy, navigable IT system (e.g., high visualization of data, clean dashboard design)</p> <p>Automated processes, which reduce extra work for involved staff and patients (e.g., automated reminder for patients to complete follow-up surveys)</p>
	A structured and integrated digital data collection system	<p>Be aware that small pilots can take off without a data collection system, but it is needed for scalability</p> <p>Ensure IT system is integrated with already existing hospital systems such as Electronic Health Records (EHR), to avoid duplicate entries</p> <p>Consider possible integration challenges when using external IT system vendors (e.g., confidential data exposure to external parties)</p>
	Consistency in data (use of standard sets)	<p>Ensure the use of consistent data measurements such as standard sets to ensure data is comparable among clinicians and providers</p> <p>Strictly define data sets to be collected prior to implementation</p>
	Data capability assessment	<p>Assess what data is already being collected (regarding outcomes and costs) and consider a disease pathway for which there is a history a data within the provider</p> <p>Assess where value can be extracted regarding existing capabilities, leveraging them</p>

	Timely accessibility of data	Quick access to outcome data to ensure accurate representation of the patients' reality Fast translation of entry data points into results analysis, which allow clinicians to visualize data in real time
	Data analytics	Data analytic experts within VBHC team Analytics team that benchmarks data and translates it into comprehensive dashboards

