Analysis of the Knowledge and Growth Subdimensions in Health Care Organizations during the COVID-19 Pandemic

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1. Background

1.1 Introduction

Evaluating the health care sector is quite challenging and complex. Unsatisfactory performance can result from long waiting times, inefficiency, dissatisfactory patients, and health care workers' (HCWs') burnout. The Balanced Scorecard (BSC) was introduced in 1992 [1] to perform performance evaluation (PE) of organizations in different domains, including health care. The initial design of the BSC consisted of four perspectives: financial, internal, customer, and learning and growth. The BSC was considered different from the other managerial tools, as it offers a holistic strategic approach. Our previous systematic review has proven BSC effectiveness in improving financial performance and patient satisfaction. All the previous systematic reviews lack a systematic methodological categorization of perspectives, dimensions, and KPIs to solve the nonuniformity challenge at the previous BSC implementations. Moreover, there is a lack of studies which evaluates BSC perspectives during the COVID-19 pandemic.

1.2 Aim

This research intended to perform a systematic review to identify all the knowledge and growth subdimensions used in balanced scorecard (BSC) implementations and then to assess the impact of the pandemic on the knowledge and growth subdimensions of health care organizations (HCOs).

2. Methods

This research consists of two steps.

First step: we performed a systematic review:

2.1 Data sources and search strategy

- In adherence with the 27-point of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist [2]. See (Figure1).
- Based on Population, Intervention, Comparison, and Outcome (PICO) tool [3].
- Both Medical Subject Headings (MeSH) terms and keywords.
- PubMed, Embase, and Cochrane.
- Grey literature, pre-prints, and unpublished studies were searched on Google Scholar and Google's search engine websites (to avoid publication bias).
- From inception until October 2020.
- Reference lists of any potentially eligible studies.
- Duplicates removal using the EndNote X9.2 program.

2.2 Study selection

- Titles and abstracts screening.
- Full texts careful examination.
- Selection of eligible studies: first and second authors independently, and third author arbitration in disagreements.
- January and March 2021.

2.3 Data extraction and analysis

-Key Performance Indicators (KPIs) were extracted from the final resulted studies.

-Fore the unification purposes, KPIs were recategorized and grouped into new sub dimensions and major dimensions.

Second step:

-We searched for independent studies using the resulting knowledge and growth subdimensions with the COVID-19 keyword in Google engine and Google Scholar.

-Until June 2021.

Figure 1. Prisma Flow Diagram

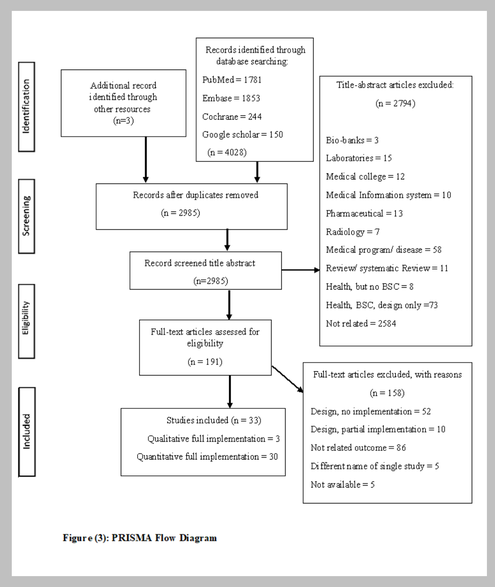


Figure e (3): PRISMA Flow Diagram

3. Results

3.1 Study selection

- Running the search strategy resulted in a total of 4031 studies.
- After removing the duplicates, a total of 2985 studies remained.
- After screening titles and abstracts 202 studies remained.
- Full texts examination resulted in 33 studies were finally included, at which 36 implementations were identified.

3.2 The KPIs in BSC implementations

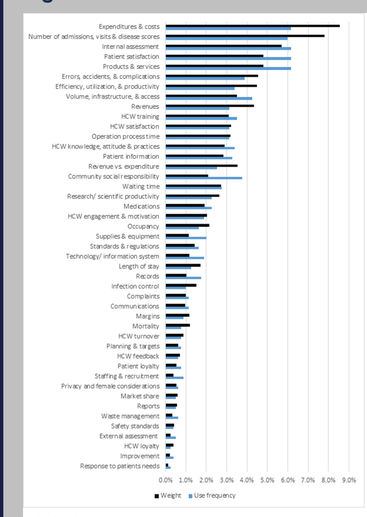
-797 KPIs were extracted. Each KPI was classified and grouped into 45 subdimensions. Next, these subdimensions were combined to form 13 major dimensions: financial, efficiency and effectiveness, availability and quality of supplies and services, managerial tasks, HCWs' scientific development error-free and safety, time, HCW-centeredness, patient-centeredness, technology, and information systems, community care and reputation, HCO building, and communication. Additionally, this review's findings reflect that the BSC design in health care must be modified to include external and administrative perspectives.

-106 knowlege and growth KPIs were extracted.

3.3 The knowledge and growth dimensions during COVID-19 pandemic

Categorizing the KPIs resulted into 2 major-dimensions with 3 subdimensions each. Many studies evaluated healthcare workers' (HCWs') knowledge, attitudes, and practices (KAP) at the beginning of the pandemic. HCW adherence to infection control measures is affected by their KAP toward COVID-19. Some studies referred to insufficient knowledge about COVID-19 among nurses. Surgeons were worried about losing their skills after months of lockdown. HCWs were obliged to learn digital health skills and effectively communicate with patients during the pandemic. It was found that publication productivity correlates with factors such as epidemiologic, healthcare system-related, and pre-COVID publication expertise factors. Additionally, the role of technology and information in tackling COVID-19 importance was explained. Telehealth allowed HCWs to provide care for patients without direct physical contact, especially to patients at quarantine, while keeping them safe. Researchers have summarized the technologies emerged to mitigate the threats of COVID-19.

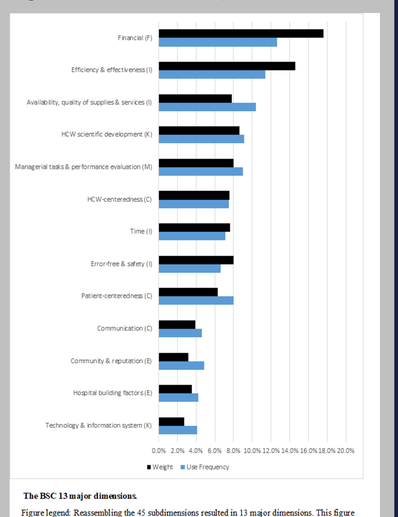
Figure 2. BSC 45 subdimensions



The BSC 45 subdimensions.

Figure legend: After re-grouping the 797 indicators, 45 subdimensions resulted. This figure shows the frequency and the weight/ importance for each subdimension independently.

Figure 3. BSC 13 major dimensions

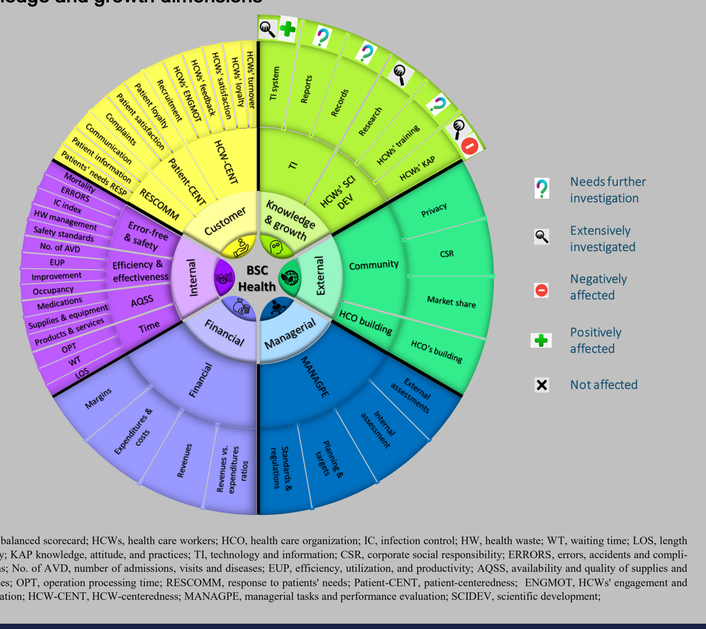


The BSC 13 major dimensions.

Figure legend: Reassembling the 45 subdimensions resulted in 13 major dimensions. This figure shows the frequency and the weight/ importance for each major dimension independently.

(F), Financial perspective; (I), internal perspective; (K), knowledge and growth perspective; (M), managerial perspective; (C), customer perspective; (E), external perspective;

Figure 4. Summary of BSC dimensions and the pandemic impact on knowledge and growth dimensions



BSC, balanced scorecard; HCWs, health care workers; HCO, health care organization; IC, infection control; HW, health waste; WT, waiting time; LOS, length of stay; KAP knowledge, attitude, and practices; TI, technology and information; CSR, corporate social responsibility; ERRORS, errors, accidents and complications; No. of AVD, number of admissions, visits and diseases; EUP, efficiency, utilization, and productivity; AQSS, availability and quality of supplies and services; OPT, operation processing time; RESCOMM, response to patients' needs; Patient-CENT, patient-centeredness; ENGMOT, HCWs' engagement and motivation; HCW-CENT, HCW-centeredness; MANAGPE, managerial tasks and performance evaluation; SCIDEV, scientific development;

4. Conclusion

-This study resolves the problem of KPI categorization nonuniformity. It also offers both theoretical and practical implications for researchers and health care executives in determining which aspects to utilize in the future deployments of BSCs, specifically, and in PEs, in general. Moreover, dimension uniformity will improve the data sharing and comparability among studies and HCOs. Utilizing the resulting dimensions as a road map in practical PEs will lead to a comprehensive enhancement of HCOs' performance worldwide.

-Researchers are encouraged to analyze the pandemic impact on knowledge and growth subdimensions. Healthcare managers need to remain updated with emerging technologies, allocate resources to invest in them, and develop the required skills in HCWs to utilize them properly.

5. Acknowledgment

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