Chapter

A Renewed Perspective on Lean Six Sigma in Healthcare: People and Performance

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Abstract

The Lean Six Sigma (LSS) approach has taken a central role in healthcare quality management, and many studies report positive effects of the method on performance of healthcare organizations. However, LSS in healthcare is also unbalanced because the human side of the method is undervalued. A more balanced application of LSS in healthcare includes an interrelated approach of both "soft" and "hard" LSS practices, broad perspective on employee well-being, "soft" HR approach related to LSS, and "soft" climate for LSS. This leads to a renewed perspective on LSS in healthcare that considers both people and performance and where the interplay between "hard" and "soft" factors is addressed.

Keywords: lean, six sigma, healthcare, performance, employee well-being, HRM, climate

1. Introduction

In the past 20 years, since the Institute of Medicine [1] defined the concept of quality of care, it has become increasingly clear that healthcare is a clashing vessel of values. Values such as good quality of care and safe and accessible care are important. But also, effective and efficient care because healthcare must also remain affordable. The Covid-19 pandemic has highlighted the struggle with bringing the different values together within healthcare systems across the globe [2]. Changed circumstances lead to different value trade-offs. For example, during the coronavirus crisis we started to look differently at lean approaches to organizing care, using as few supplies as possible (also called just-in-time management) [3]. Other existing issues were put on edge by the crisis. For example, Covid-19 did not create the healthcare staffing shortage, but the impact is worsened because of it, visible in current high levels of burnout among healthcare professionals [4]. In addition, consider the challenges of access to healthcare services and of enhancing the quality of care and patient safety while reducing costs [5]. These existing challenges, amplified during the Covid-19 pandemic, emphasize the importance of operations management for healthcare for years to come. Moreover, it demands a renewed perspective on commonly applied operations management

methodologies in healthcare, such as Lean Six Sigma (LSS), which integrates values regarding people and performance. In this chapter, in which we, among other things, use PhD work done before [6], we will start with a short history of LSS in healthcare, followed by identifying gaps in the application of this method based on current literature, leading to proposed renewed perspective on LSS, the scientific and managerial relevance of this perspective, and a research agenda for the upcoming years.

2. A brief history of lean six sigma in healthcare

The LSS approach has taken a central role in healthcare quality management. LSS follows a long history of system management and quality improvement, starting at the beginning of the twentieth century through mass production affected by among others, Henry Ford, followed by the Toyota Production System (TPS) in the Japanese automotive industry and adopted as Lean Management (LM) in the Western world since 1980 [7]. Around the same time that LM was embraced, many large companies, including Motorola and General Electric, implemented Six Sigma (SS) with a focus on reducing errors and minimizing variability [8]. LSS as a combination of Lean Management and Six Sigma is seen as the most effective process improvement that it is widely implemented in the top performing organizations [9], also in healthcare settings [2, 10]. Although the integration of Lean Management and Six Sigma is still relatively rare in healthcare [11], more and more studies report positive effect of LSS on outcomes. For example, Bhat et al. [12] explore the successful deployment of LSS in the Indian healthcare sector and found improvements in patient registration cycle time and reductions in average waiting time, queue length, and staff utilization. Antony et al. [13] report the use of LSS in reducing medication errors in the Norwegian public healthcare context. The Mayo Clinic Rochester in the USA increased their process efficiency and financial performance by applying LSS [14]. A recent study by De Koeijer et al. [15] shows strong positive effects of LSS on internal process and financial performance in university hospitals in the Netherlands. These studies illustrate that in healthcare, LSS is commonly applied with the aim to improve process efficiency, thereby improving quality and reducing costs [7]. Given these positive reports of LSS and given the ever-increasing costs in healthcare, it is very likely that the application of LSS will grow rapidly in healthcare. However, the Covid-19 pandemic has taught us that a narrow focus on specific values of care, such as safety and efficiency, can lead to neglect of other crucial values of care, such as humanity and taking care of healthcare personnel. And this risk is also apparent for LSS. In the next paragraph, we will discuss why LSS, in its current form, is likely to be insufficiently equipped to tackle the multifaceted challenges that healthcare systems are facing, including rising costs, growing expectations from patients, demographic changes, and growing burn-out rates among healthcare professionals.

3. Lean six sigma in healthcare: unbalanced?

From the beginning, criticism has been part of LSS in healthcare. Some researchers and practitioners object to the notion of industrialized healthcare delivery. They argue that tensions may arise between the need to demonstrate efficiency and achieve performance targets (derived from governmental financial pressure) and the need to invest time and resources in continuous improvement. Moreover, some state that with these increasing administrative burdens and productivity targets, the intrinsic

motivation of healthcare employees is suffering [16]. LSS is controversial from the perspective of employees. Proponents argue that healthcare organizations that embrace LSS to improve performance can simultaneously foster employee well-being. Opponents, however, say that LSS leads to higher performance yet lower employee well-being. LSS is not a neutral and value-free activity, and the debate about relationship between LSS and employee well-being is crucial in the light of the workforce shortage in healthcare combined with current high levels of burn-out among healthcare professionals. One of the explanations for this ongoing debate could be that LSS, in its current form, is unbalanced in several ways.

First, the application of LSS in healthcare is accompanied with a heavy focus on tools and techniques at the expense of the human side [17]. The LSS toolbox that healthcare organizations deploy tends to be filled with "hard" LSS practices focusing on process improvements. Henrique and Filho [18] state in their systematic review that the most common techniques used in healthcare are VSM, Standardization of Work, and Visual Management. Also, LSS practices such as "focus on metrics" (the use of quantitative metrics to measure quality and process performance and to set improvement goals) and "process management" (e.g., statistical process control and error-proof process design) illustrate the dominant "hard" focus of LSS practices. Due to this single-minded focus on process improvement, LSS initiatives risk being perceived as cost-cutting efforts at odds with the values of healthcare and therefore risk the withdrawal of staff and potential resistance. Moreover, the outcomes of healthcare organizations depend, on the one hand, on routine and standardized processes and, on the other hand, on employees with the right customer mindset and ability to anticipate changing demands from their customers [15]. "Hard" and "soft" LSS practices should thus go hand in hand: a singular focus on a "hard" approach to optimizing processes neglects the human factor, while a one-dimensional focus on a "soft" approach complicates the attainment of performance outcomes. Therefore, this chapter contains a balanced interrelated approach of LSS practices in healthcare (see **Table 1**) that consists of both "hard" practices, which are focused on practices for improving processes (quality information, process management, structured improvement procedure, focus on metrics) and "soft" practices aimed at employees and relationships (top management support, customer relationship, and supplier relationship). This interrelated approach of LSS makes it possible to empirically examining the effects of multiple dimensions on outcomes.

Second, although many healthcare organizations state that both efficiency and employee goals are drivers for applying LSS, the conceptualization of employee goals is very limited compared with efficiency and quality targets [7, 19, 20]. Where recent research in healthcare agrees on two core performance dimensions of LSS: internal process and financial, employee well-being is poorly defined. For example, a study by Niemeijer et al. [21] of almost 300 LSS projects in Dutch hospitals describes concrete aims of LSS initiatives regarding reducing costs, improving safety, and increasing revenue; however, employees' outcomes are not characterized. And when employee goals are mentioned in studies on LSS, this is mostly done in terms of workers satisfaction [22, 23]. It is important to create a more balanced perspective of employee well-being, since there is no agreement on the effect—positive, negative, or nonexistent—of LSS on employee well-being [24]. For example, studies by Graban [25], Stamatis [26], and Collar et al. [27] mention improved levels of commitment and satisfaction related to LSS initiatives. However, a large study by the Saskatchewan Union of Nurses [28] showed that LSS had an overall negative effect on worker satisfaction, and studies by Angelis et al. [29] and White et al. [30] discuss negative effects of LSS on worker

LSS practices that are part of the systems approach	Description	Special aspects in a healthcare setting
Top management support	Top management accepts responsibility for quality, creates and communicates a vision focused on quality and encourages and participates in quality improvement efforts.	Managers and physicians together form top management.
Customer relationship	Customer needs and expectations are regularly surveyed. Customer satisfaction is measured. There is a close contact with key customers.	Customers are not only patients, but also family members, caregivers, decision-makers and insurers.
Quality information	Timely collected quality data are available to managers and employees, and must be used for improvement.	Delivering care is a complex process. Collecting accurate and reliable information is a challenge.
Focus on metrics	Quantitative metrics are used to measure process performance and quality performance, and set improvement goals. Business-level performance measures and customer expectations are integrated with process-level performance measures.	
Process management	Statistical process control and preventive maintenance are applied. Managers and employees make efforts to maintain clean shop floors and meet schedules. There is an emphasis on mistake-proof process design.	Safety and hygiene are crucial in a patient environment. A clean working environment and well maintained devices are a requirement.
Structured improvement procedure	There is an emphasis on following a standardized procedure in planning and conducting improvement initiatives. Teams apply the appropriate quality management tools and techniques.	Professionals are trained to act with autonomy. Too much emphasis on standardization could evoke resistance.
Supplier relationship	A small number of suppliers are selected on the basis of quality and involved in product development and quality improvement. The organization provides suppliers with training and technical assistance.	There are many areas of knowledge and practice. In general, each specialty has preference for certain suppliers and assortments.

Table 1.
LSS interrelated systems approach of both "hard" and "soft" practices.

Well-being components	Description	Special aspects in a healthcare setting
Health	The physical or health dimension encompasses indicators related to employee health, such as workload, job strain and need for recovery.	Healthcare professionals perceive increased demands and expectations from customers.
Happiness	The psychological or happiness dimension refers to subjective experiences of employees, i.e. their psychological well-being, for example job satisfaction and unit commitment.	Professionals highly value performing rewarding work.
Trusting relationships	The relationship dimension of employee well-being focuses on the quality of trusting relationships between employees and their employer and colleagues.	The hierarchical structure impacts the relations between employees and their employer and colleagues.

Table 2.
Employee well-being.

commitment. Reviews of studies that focus on trusting relationships and health effects of LSS report mainly negative effects [31]. Since most healthcare organizations claim that employee goals are part of the LSS approach, it is wise to define these goals to determine the effect—positive, negative, or nonexistent—of LSS on employee well-being. A broad perspective on employee well-being supports healthcare organizations in monitoring these goals, and based on recent literature [15, 32], this chapter contains the following balanced conceptualization of employee well-being, related to LSS, which includes three components: happiness (satisfaction and commitment), trust, and health (workload and need for recovery) (see **Table 2**).

4. The human side of lean six sigma in healthcare – HRM and climate

Although employees' issues related to LSS are substantial, since LSS in healthcare commonly focuses on organizational challenges that have to do with work (re)design in a complex and dynamic environment, the attention for management of employees is limited. LSS initiatives are a result of collective efforts and require engaging a multitude of actors (e.g., clinicians, nurses, and administrators) and LSS project members operate as "liaison officers" between professional groups, between organizational "layers," and between the internal and external worlds of the healthcare organization. To fulfill their role successfully, LSS project members need specific abilities, motivation, and opportunities. Also, given potential conflicts of interest between different stakeholders, management decisions are needed to shape employment relationships that are aimed at achieving specific (LSS) goals. The employees' issues as described above show the importance of strategic Human Resource Management (HRM) related to LSS; however, especially in healthcare HRM is still considered as a more operational or tactical concept within the larger framework of LSS [33]. For example, Antony et al. [34], and Honda et al. [35] state that training is crucial when implementing LSS. Buestan et al. [36] and Ahmed et al. [37] argue that successful implementation of LSS depends on the participation of healthcare staff. While these separate HR practices are indeed relevant, there is a need for a more coherent, and strategic perspective on HRM that is in sync with LSS. For example, cross-functional teams could help to generate ideas for science-based, systematic quality initiatives [38]. Performance appraisal and rewards could also function as morale boosters and encourage employee engagement [9, 39, 40]. In addition, training and development are crucial to getting skilled and motivated people to work on LSS projects [41, 42]. Employee participation and engagement in decision-making and problem-solving can also help inspire commitment to organizational excellence [43]. If LSS can be imagined as a dance within healthcare organizations, then HRM is its matching dance partner and together they make sure that the dance is balanced on "hard" and "soft" issues. Therefore, this chapter provides a more balanced union between LSS and HRM by including a separate strategic HRM approach (see **Table 3**). By constructing LSS and HRM separately, it provides an approach that does justice to both perspectives [15], and it supports investigating effects and relationships of these two approaches combined and separately.

In addition, the narrow focus on the "hard" side of LSS has led healthcare to neglect activities that encourage employees to develop shared perceptions of LSS. These shared perceptions are important for the internalization of LSS interventions [44]. For the effects of LSS to become visible and measurable, a process of routinization must take place in which professionals adopt these new work practices and adapt their existing organizational routines accordingly. However, there is a dearth

HR practices that are part of the systems approach	Description	Special aspects in a healthcare setting
Participation and job design	Employees are involved in quality decisions and have the opportunity to take responsibility for their own tasks.	Professionals are trained to act with autonomy. They are, together with their colleagues, responsible for delivering quality of care.
Training and development	Both managers and employees receive training on quality management. There are opportunities to develop new skills and knowledge.	Professionals are highly trained individuals with a specific expertise. Performing tasks or development outside their area of expertise is unusual.
Performance appraisal and rewards	Employees receive feedback on quality performance of their team and are rewarded for quality improvement.	Quality of care is highly appreciated and rewarded in healthcare organizations.
Team working and autonomy	Teams are formed to solve problems. Teams are encouraged to try to solve their problems as much as possible.	Health care is usually provided by multidisciplinary teams of professionals and support services.
Employment security	Employees have an employment contract that offers job security.	Increasing expenditures create pressure on organizations.
Work-life balance	Employees have the possibility to work flexible hours and arrange their work schedule.	Consumers are increasingly putting higher demands and expectations on healthcare professionals. Therefore, it is challenging to balance the needs of work and life for professionals.

Table 3.
HRM systems approach.

of research investigating the organizational patterns (routines) that LSS implementation may enable [13]. Adopting LSS in such a way that it becomes a permanent part of the organization's daily routine can be described as internalization [45]. New routines cannot be sustained in a setting that does not support and enable their performance, however. For example, unless the LSS climate reflects employees' belief in the real value of LSS for their organization, there is a significant risk that LSS will never be internalized [46]. This risk is particularly acute in healthcare because healthcare professionals fear that adopting LSS will lead to over-standardization [47] and that LSS redirects clinical practice away from patient care toward more administrative and management tasks [48]. Shared perceptions support employees in their drive to sustain quality improvement initiatives [49] and in their commitment to accomplishing organizational excellence [43, 50]. Creating a climate for LSS that reflects positive shared perceptions of employees about LSS practices and their commitment to them is therefore crucial to the internalization of LSS [45]. Climate is consistently conceptualized as employees' shared perceptions about the nature of their organization in terms of events, policies, practices, and procedures [51, 52]. Internally, climate is often considered actionable, i.e., management can try to shape climate to pursue organizational goals and influence performance [53, 54]. Many scholars of operations management have attempted to define a climate for LSS, most of them by drawing on the experience of organizations that have implemented LSS successfully [55]. Bhat et al. [2] argue that an integrated LSS strategy ensures a climate of continual improvement in the healthcare setting. Goodridge et al. [56]

state that LSS seeks to create an environment in which mistakes are opportunities for learning, with consistent application of no-blame approaches to mistakes and errors. Ambekar and Hudnurkar [57] claim that people with a positive attitude and critical-thinking capability innovate and ideate solutions. While researchers agree that a successful LSS implementation will aim to achieve climate change and succeed, they fail to agree on the specific characteristics of such a climate for LSS. This chapter highlights a "soft" climate for LSS that reflects employees' perceptions regarding the extent to which the organization emphasizes specific LSS values, goals, expected behaviors, and contributions at work, related to quality, innovation, and efficiency [15, 58].

5. A renewed perspective on lean six sigma in healthcare: people and performance

In the above paragraphs, we discussed different lines of thought on supporting a more balanced application of LSS in healthcare: by embracing an interrelated approach of both "soft" and "hard" LSS practices, by adopting a broad perspective on employee well-being and by developing the human side of LSS in healthcare by constructing a "soft" HR approach related to LSS, and by adapting a "soft" climate for LSS. This brings us a renewed perspective on LSS in healthcare that considers both people and performance and where the interplay between "hard" and "soft" factors is addressed, contrary to earlier research [59].

When focusing on the interplay between "soft" and "hard" factors, there are a few relationships that need to be considered. For example, it is important not to pick and choose from the LSS toolbox [60, 61], healthcare organizations may benefit the most from LSS, when applied as a systems approach of LSS practices. Also, the relationship between LSS, performance, and employee well-being is worth discussing. Healthcare organizations that adopt LSS to improve organizational performance may assume based on the more classical view (see **Figure 1a**) that LSS will also benefit or at least not harm employees. However, recent research [6] shows that the situation might be more complex and that LSS is suitable for improving performance and unsuitable for increasing employee well-being. In fact, they show that performance and well-being are at odds with each other: when well-being increases, performance

Figure 1.
a: Classic view on LSS in healthcare. b: Renewed perspective on LSS in healthcare: People and performance.

decreases and vice versa. This may lead to a new perspective on the ongoing discussion whether LSS positively or negatively impacts employees. In this chapter, we argue that LSS is simply not designed to improve employee well-being. Although this may seem obvious, systematic reviews by D'Andreamatteo et al. [23] and Moraros et al. [22] mention both efficiency and employee goals as drivers for applying LSS in healthcare organizations. However, the driver for improving employee well-being is not visible in the way LSS is designed: especially in healthcare LSS is often applied as a set of "hard" practices, concerning tools and techniques for improving processes. Therefore, our renewed perspective on LSS in healthcare reserved a special place for HRM (see **Figure 1b**). Not only does research show that HRM is essential to improve employee well-being [15, 62], previous studies have confirmed that HRM plays a vital role in shaping climate and thereby internalizing LSS [63]. HRM is crucial for creating shared perceptions among employees and, consequently, a climate for LSS [6]. In this context, HRM can be seen as a signaling system that constantly sends messages to employees stressing the attitudes and behaviors desired within the organization. For example, hospital management can use HR practices to create a desired climate where LSS initiatives take root by communicating to employees that quality improvement is important, that improvement initiatives and innovative behavior are expected and rewarded, and that attaining organizational excellence is encouraged [43, 50]. Where LSS practices are more generic, HR practices are developed specifically for employees. For example, quality management training can be tailored to specific employee groups and their educational backgrounds. Following this line of thinking, it can be said that HRM boosts employee engagement and involvement in continuous quality improvement [43, 64]. Finally, by adapting a climate for LSS, employee well-being is improved [15]. Given the ambition of hospitals to maintain higher standards of both organizational performance and employee well-being, it is crucial that hospitals that adopt LSS should also foster a climate for LSS by combining LSS and HRM, thereby internalizing LSS. Employees interpret management activities as indicative of organizational support and care and reciprocate accordingly with commitment, satisfaction, and trust [65]. In that sense, healthcare employees may experience HRM as a form of recognition and concern, creating a climate for LSS and affecting their well-being.

Summarizing, with the renewed and balanced perspective on LSS in healthcare that encompassed people and performance (see **Figure 1b**), healthcare organizations can create mutual gains and sustainable outcomes for both the organization and employees. With this renewed perspective, healthcare organizations can face multifaceted challenges related to both performance (for example rising costs and growing expectations from patients) and people (for example retaining highly dedicated and competent employees and growing burn-out rates among healthcare professionals).

6. Managerial and practical implications

Many healthcare organizations that struggle with both challenging efficiency targets as well as increasing personnel shortages have tried to find one cure for all their problems by embracing LSS. However, despite promising (sales) stories about LSS, for example, that it leads to happy employees who have more time for the work they are passionate about, this chapter shows that LSS in healthcare is unbalanced. The heavy focus on tools and techniques at the expense of the human side, the poorly conceptualization of employee goals, the limited attention for management of employees,

and a climate for LSS may lead to suboptimal results, which will not be conducive to establishing a fully-fledged quality philosophy [43]. One could argue that LSS should be used for those processes where the financial pressure is high. But the danger is that LSS will become a concept that is not that attractive for healthcare professionals, since performance will not be at the core of their profession. How can a healthcare organization stay financially sustainable and deliver good quality without happy, healthy, and trusting employees? The systematic review by Hall et al. [66], for example, shows that low levels of well-being of healthcare workers are correlated with poorer patient safety. Fortunately, from a management perspective, we see that adopting a balanced approach of both "soft" and "hard" LSS and HR practices allows healthcare organizations to capitalize on their synergies for internalizing LSS, performance, and employee well-being. Management can use HRM to shape a climate for LSS conducive to the pursuit of organizational goals and the well-being of employees. Therefore, healthcare organizations should involve their HR departments right from the start when introducing LSS programs to ensure that a HRM systems approach is in place. In many healthcare organizations, HRM—unlike LSS—is a consistent component, covering all employees. There is a fundamental different pace of HRM and LSS. Where LSS in healthcare is focused on improving short-term efficiency through short-cycle improvement projects [67, 68], HRM is present constantly. HR practices are practical and can be tailored to specific employee groups and their educational backgrounds. For example, HR practices such as teamwork, participation, and training involve employees at different levels in continuous quality improvement. Management can use these HRM practices to create a desired climate in which LSS initiatives can take root. It is important that managers are consistent in communicating to employees what is valued and considered important in the organization and the kind of behaviors and attitudes that are expected and rewarded [69, 70]. For example, they should emphasize the importance of continuous improvement and of achieving quality outcomes and discuss with employees how they can contribute in practical terms.

It is vital for healthcare executives to acknowledge the fundamental dichotomy between the process-oriented tasks required to provide health services and human factors [71]. Where most literature on LSS so far has argued for the inclusion of HR practices in an LSS systems approach, this chapter enlightens that LSS and HRM should be viewed as two different things. Separating LSS and HRM could be an opportunity for healthcare organizations, since a critical challenge that faces LSS implementation is a lack of belief that it will work [14]. Employees might perceive LSS as something new and be hesitant to embrace the method [72], also due to the increasing internal and external pressure to work more efficiently. When the resistance to apply LSS is growing, healthcare organizations can be flexible in reframing the method, while at the same time can be tenacious in applying HRM systems approach. This conclusion also has impact on the positioning of LSS in healthcare organizations. As LSS is meant to continuously improve performance and not employee well-being, it makes much more sense to make LSS part of the quality and safety department. HRM departments have a separate and equal important task to continuously foster the health, happiness, and trusting relationships of the employees of their healthcare organizations. Still, LSS and HRM require constant alignment and should be managed integrally. In practice, this could mean that when healthcare executives share the "why" of LSS within the organization, they should emphasize both performance improvements and higher levels of employee well-being. Another recommendation is to monitor progress in LSS integrally by focusing not only on the number of LSS initiatives and their progress but also on the happiness, health,

and trusting relationships of employees, and by explicitly including performance indicators in the "LSS dashboard." In addition, since direct supervisors play a prominent role in transmitting values and climate [73], they should actively support their employees with a balanced approach that incorporates both "hard" and "soft" factors into the improvement process [74]. For example, appraisal interviews should not only focus on "hard" key performance indicators, but also on improvement efforts and more narrative input. This may also mean that employee productivity would temporarily decline to allow time for improvement projects or quality training.

Concluding, in recent years, a great deal has been invested in LSS in healthcare: belts have been trained, improvement teams have been formed, and LSS improvement approaches have been widely embraced. This chapter demonstrates an optimistic view about LSS in healthcare, if applied balanced and with a focus on people and performance (see **Figure 1b**). With this renewed perspective, where HRM is strategically aligned with the goals of LSS, healthcare organizations can create mutual gains and sustainable outcomes for both the organization and employees.

7. Agenda for future research

To acquire a deeper understanding of the causal relationships in our renewed perspective on LSS, future research should apply a longitudinal and intervention design (including control settings). Such research could, for example, examine a potential spiraling positive or negative effect, i.e., that the more LSS in combination with HRM is adopted, the more LSS is internalized and the more performance and employee well-being improve, and vice versa. Longitudinal research could also verify whether the relationships as discussed in this chapter, for example, between LSS and performance, HRM, climate, and well-being, are cause-and-effect relationships.

In addition, it is interesting to investigate whether the renewed perspective on LSS is generic for different types of healthcare organizations (e.g., hospitals, elderly, and disabled care) or that a specification for each subsector is needed. Also, the current in-patient and specialty-oriented view of healthcare professionals will develop into more disease path- and care chain focused ways of working, in (regional) teams with common integral responsibility for each other's functioning [75]. Therefore, it is interesting to conduct future research into multidisciplinary teams, consisting of healthcare professionals from different healthcare institutions that work together on LSS initiatives.

Finally, we need a broader definition of performance in relation to LSS, as well as a more comprehensive set of performance measures. The definition of performance related to LSS, namely "value for customers while optimizing resources" [76] could benefit from a more contemporary and healthcare-specific clarification. Recent debates have focused on how performance in healthcare should be defined and measured [77]. For example, is performance about costs, efficiency (e.g., shorter waiting times, improved utilization), customer satisfaction, quality, health-related outcomes, or all of the foregoing [78, 79]? In light of these recent debates, we argue that the definition of performance in relation to LSS should be updated and clarified specifically in the context of healthcare. In addition to this chapter setting out a wide range of perceived improvements (e.g., internal processes, customer satisfaction, and financial results), we propose incorporating objective outcome measures into any future research.

8. Conclusion

The LSS approach has taken a central role in healthcare quality management, and many studies report positive effects of the method on performance of healthcare organizations. However, LSS in healthcare is also unbalanced in several ways. First, the application of LSS in healthcare is accompanied with a heavy focus on tools and techniques at the expense of the human side. Second, although many healthcare organizations state that both efficiency and employee goals are drivers for applying LSS, the conceptualization of employee goals is very limited compared with efficiency and quality targets. In this chapter we discuss different lines of thought on supporting a more balanced application of LSS in healthcare: by embracing an interrelated approach of both "soft" and "hard" LSS practices, by adopting a broad perspective on employee well-being and by developing the human side of LSS in healthcare by constructing a "soft" HR approach related to LSS, and by adapting a "soft" climate for LSS. This brings us a renewed perspective on LSS in healthcare that considers both people and performance and where the interplay between "hard" and "soft" factors is addressed, contrary to earlier research [59]. With the renewed and balanced perspective on LSS in healthcare that encompassed people and performance (see **Figure 1b**), healthcare organizations can create mutual gains and sustainable outcomes for both the organization and employees.

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