

# Go Lean, Get Leaner

## The application of lean management in Omani healthcare

\*Yahya M. Al-Farsi<sup>1</sup> and Shahid M. Al-Balushi<sup>2</sup>

كن رشيقا، واسعى نحو مزيد من الرشاقة  
تطبيق "إدارة اللين" في الرعاية الصحية العمانية

يحي محمد الفارسي و شاهد محمود البلوشي

AS IN MANY COUNTRIES, THE PUBLIC HEALTH-care system in Oman strives to maintain high-quality services despite rising costs.<sup>1</sup> Between 1970 and 2017, healthcare services in the country have witnessed remarkable improvements, resulting in an increase in the life expectancy of Omanis from 49 to 75 years and a drop in the infant mortality rate from 120 to 9 cases per 1,000 live births.<sup>2</sup> Notably, the World Health Organization ranked the health system in Oman to be the eighth best in the world in 2000.<sup>3</sup> The Omani government provides universal health coverage, ensuring free access to Omani citizens and subsidised services for expatriates; however, this makes the system vulnerable to unnecessary waste and results in avoidable operational costs.

Between 2000 and 2010, healthcare expenditures constituted approximately 3% of the gross domestic product; in 2016, this was equivalent to about \$3.4 billion USD allocated mainly to the Ministry of Health, which handles almost 80% of all healthcare expenditures.<sup>4</sup> In 2017, the Omani government reduced overall healthcare expenditures by 47% to \$1.6 billion USD.<sup>5</sup> Nevertheless, it has been projected that healthcare expenditures in Oman will continue to rise at an annual rate of 12.9%, with total healthcare expenditures reaching \$4.3 billion USD by 2020.<sup>6</sup> As in other Gulf Cooperation Council (GCC) countries, securing and maintaining sufficient financial support for healthcare expenditures in Oman can be challenging due to fluctuations in crude oil prices. As a result, there is an urgent need to adopt sustainable cost-reducing operational models, thereby reducing costs without compromising the quality of healthcare services.

One particular model is the adoption of lean management (LM), a system that originated in the Japanese automobile industry and focuses on value-creating processes.<sup>7,8</sup> In the healthcare sector, an LM approach is based on five important principles.<sup>9</sup> The first is identifying value in patient care-related activities. The second is creating a value stream map (VSM) of the entire

patient care process from entrance to discharge so as to identify which parts are necessary and which are wasteful.<sup>9</sup> The third is creating flow to ensure that discrete activities within the process are aligned and standardised based on best practices. The fourth is establishing a pull system, whereby each activity is a product of the prior step.<sup>9</sup> Finally, the fifth principle is seeking perfection in a cycle of continuous quality improvement.

There is a growing body of research regarding the applications and potential benefits of LM principles in healthcare; however, much of this research is sourced from hospitals in developed countries, with very limited research in other contexts.<sup>10</sup> In particular, a recent review of the literature found that there was limited research on this topic being conducted in the GCC region.<sup>11</sup> In Oman, Al Farsi *et al.* recommended that lean improvement pilot projects be undertaken so as to guide the development of a national strategy for implementing LM principles in the healthcare sector.<sup>7</sup>

In the August 2018 issue of *SQUMJ*, Al-Balushi *et al.* published a study describing the implementation of LM principles in the radiation oncology department of a tertiary hospital in Muscat, Oman.<sup>12</sup> The study aimed to streamline workflow and reduce waste in response to a transition that had occurred following the decommissioning of a treatment machine. Various LM concepts were introduced via continuing medical education activities and a VSM was created to outline the chain of processes followed in the department.<sup>12</sup> The VSM indicated that only six out of 13 steps were value-adding; accordingly, several waste-reduction strategies were introduced. The authors concluded that the application of LM principles improved workflow, reduced waste and enhanced patient and staff satisfaction.<sup>12</sup>

The findings of such pilot studies are promising and indicate the successful implementation of LM principles in one Omani setting. However, in terms of the readiness of the entire healthcare system, there are seven readiness factors which need to be taken into account in order to ensure the successful launch of LM in healthcare in

<sup>1</sup>Department of Family Medicine & Public Health, College of Medicine & Health Sciences and <sup>2</sup>Department of Operations Management & Business Statistics, College of Economics & Political Science, Sultan Qaboos University, Muscat, Oman

\*Corresponding Author's e-mail: ymfarsi@squ.edu.om

Oman.<sup>11</sup> These factors are: (1) leadership support; (2) the identification of LM principles in a strategic agenda; (3) an understanding of the concept of value and specific customer groups in healthcare; (4) having a complete end-to-end view of the entire process; (5) the training and involvement of personnel; (6) the implementation of measurement and reward systems; and (7) matching of demand and capacity levels.<sup>11</sup> Maijala *et al.* found that the characteristics of leadership and management associated with the successful adoption of LM thinking in healthcare were mainly conceptualised as skills and capabilities, such as making changes occur, being empowered, communicating, facilitating and organisational success.<sup>13</sup>

Nevertheless, it is also important to evaluate the results of such studies in view of the limitations associated with LM implementation. Despite the success concluded by Al-Balushi *et al.*, there may be challenges in sustaining these improvements in the long term.<sup>12</sup> For example, the main motivation for implementing LM principles in this case was to overcome an anticipated yet temporary disruption in workflow. However, the LM model aims to completely transform an organisation's thinking, ultimately leading to holistic and fundamental changes in behaviour and culture over time in a continuous cycle of waste reduction and quality improvement.<sup>9,14</sup> In the USA, Shortell *et al.* found that there were wide variations in terms of the degree of LM implementation in hospitals and that LM concepts took time to gain traction; moreover, they found that the length of time performing LM activities was positively associated with implementation progress and resulted in a positive impact on performance.<sup>15</sup>

Furthermore, it is possible that the successes reported by pilot studies such as that of Al-Balushi *et al.* might not be reproducible or sustainable.<sup>12</sup> Mazzocato *et al.* reported that research on the sustainability of LM principles in healthcare is limited, with primary studies often lacking appropriate or explicit concepts, designs, analysis and outcome measures necessary to produce valid and generalisable results that ensure reproducibility and sustainability.<sup>16</sup> For example, in Al-Balushi *et al.*'s study, no survey was conducted to assess patient and staff satisfaction regarding the application of LM principles.<sup>12</sup> In addition, no statistical or objective analysis was performed to quantitatively assess the timeliness of treatment delivery.

In conclusion, LM appears to be a strategy which has the potential to cause a transformational shift in the efficiency of the healthcare setup in Oman; moreover, existing research shows that the Omani healthcare sector has most of the readiness factors necessary for the successful implementation of LM principles.<sup>7,11,13</sup> Nevertheless, it is important to take into consideration the holistic

and long-term scope of the LM model, as well as the limitations associated with the application of LM principles in healthcare settings.

## References

1. Al-Riyami A. Health vision 2050 Oman: A committed step towards reforms. *Oman Med J* 2012; 27:190–1. <https://doi.org/10.5001/omj.2012.43>.
2. Oman Ministry of Health. Annual reports. From: [www.moh.gov.om/en/web/statistics/annual-reports](http://www.moh.gov.om/en/web/statistics/annual-reports) Accessed: Feb 2018.
3. World Health Organization. The World Health Report 2000: Health systems - Improving performance. From: [www.who.int/whr/2000/en/](http://www.who.int/whr/2000/en/) Accessed: Feb 2019.
4. Oman National Centre for Statistics and Information. Statistical year book 2017. From: [www.ncsi.gov.om/Elibrary/LibraryContentDoc/bar\\_Statistical%20Year%20Book%202017\\_c2111831-e13a-4075-bf7b-c4b5516e1028.pdf](http://www.ncsi.gov.om/Elibrary/LibraryContentDoc/bar_Statistical%20Year%20Book%202017_c2111831-e13a-4075-bf7b-c4b5516e1028.pdf) Accessed: Feb 2019.
5. Oxford Business Group. Oman's health care system increasingly ready to meet the population's needs. From: <https://oxfordbusinessgroup.com/overview/rise-growing-population-finds-health-care-system-ready-meet-its-needs> Accessed: Feb 2019.
6. Alpen Capital. Alpen Capital forecasts steady growth for the GCC healthcare industry. From: [www.alpencapital.com/news/2018/2018-March-26.html](http://www.alpencapital.com/news/2018/2018-March-26.html) Accessed: Feb 2019.
7. Al Farsi Y, Al Abri R, Al Hajri A, Al Balushi S. The need for lean thinking in the Omani health care sector. *Oman Med J* 2014; 29:248–9. <https://doi.org/10.5001/omj.2014.66>.
8. Liker JK. *The Toyota Way: 14 management principles from the world's greatest manufacturer*, 1st ed. New York, USA: McGraw-Hill, 2004. Pp. 67–330.
9. Graban M. *Lean Hospitals: Improving quality, patient safety, and employee engagement*, 2nd ed. New York, USA: Productivity Press, 2011. Pp. 1–16.
10. Henrique DB, Filho MG. A systematic literature review of empirical research in lean and six sigma in healthcare. *Total Qual Manag Bus Excell* 2018. <https://doi.org/10.1080/14783363.2018.1429259>.
11. Al-Balushi S, Sohal AS, Singh PJ, Al-Hajri A, Al-Farsi YM, Al-Abri R. Readiness factors for lean implementation in healthcare settings: A literature review. *J Health Organ Manag* 2014; 28:135–53. <https://doi.org/10.1108/JHOM-04-2013-0083>.
12. Al-Balushi MM, Al-Mandhari Z. Implementing lean management techniques at a radiation oncology department. *Sultan Qaboos Univ Med J* 2018; 18:e362–6. <https://doi.org/10.18295/squmj.2018.18.03.016>.
13. Maijala R, Eloranta S, Reunanen T, Ikonen TS. Successful implementation of lean as a managerial principle in health care: A conceptual analysis from systematic literature review. *Int J Technol Assess Health Care* 2018; 34:134–46. <https://doi.org/10.1017/S0266462318000193>.
14. Smith G, Poteat-Godwin A, Harrison LM, Randolph GD. Applying lean principles and Kaizen rapid improvement events in public health practice. *J Public Health Manag Pract* 2012; 18:52–4. <https://doi.org/10.1097/PHH.0b013e31823f57c0>.
15. Shortell SM, Blodgett JC, Rundall TG, Kralovec P. Use of lean and related transformational performance improvement systems in hospitals in the United States: Results from a national survey. *Jt Comm J Qual Patient Saf* 2018; 44:574–82. <https://doi.org/10.1016/j.jcjq.2018.03.002>.
16. Mazzocato P, Holden RJ, Brommels M, Aronsson H, Bäckman U, Elg M, *et al.* How does lean work in emergency care? A case study of a lean-inspired intervention at the Astrid Lindgren Children's Hospital, Stockholm, Sweden. *BMC Health Serv Res* 2012; 12:28. <https://doi.org/10.1186/1472-6963-12-28>.