Revista Argentina de Clínica Psicológica
2020, Vol. XXIX, N°5, 2030-2034
DOI: 10.24205/03276716.2020.1198

Potential benefits of lean management applications and awareness by health managers in Turkey

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Abstract

the satisfaction of patients and health care workers and improve problem solving skills.This research is important in order to contribute to the adoption of health managers by examining the potential benefits of lean management.In the last ten years in hospital management, lean management approach has been accepted as one of the important initiatives that have the potential to produce solutions to problems. The aim of this study is to determine the knowledge and attitudes of people working as currently manager of lean management model of research this study, a model for implementation in hospitals in Turkey is aimed to develop.

This is a descriptive cross-sectional study. The study was carried out with 75 senior health managers working in 5 hospitals applying the lean management approach. Findings of the research pearson correlation, one-sample kolmogorov-smirnov, indiependent sample t test and ANOVA tests were caculated.Factors such as title, education level, age, gender, hospital, number of beds in hospital did not show a significant difference in the attitudes of managers in lean management approach. And the hypotheses have been accepted. "Lean Hospital Model of Turkey" was developed with the findings of the research. Recommendations on lean hospital practices are presented. Attitudes of hospital managers to lean management approach is positive in Turkey. Lean training, pilot projects, interdisciplinary lean teams were established and improvements were made to increase the performance of hospitals, increase

Keywords: lean hospital, hospital managers, potential benefit

INTRODUCTION

The lean management approach is to get rid of everything that is not needed (Türkan, 2010). Lean management approach is an effective method of improving patient safety quality and costs while preventing delays and increasing employee satisfaction (Savage, Parke, Knorring, & Mazzocato, 2016; Lindskog, Hemphälä, Eklund, & Eriksson, 2016).

Lean approach's pioneering was first laid in the 1950s in Japanese Toyota company, led by engineer Eiji Toyoda, a member of the Toyoda family, and Taiichi Ohno, an engineer with whom he worked together (Çetin, 2014). Lean hospital practices in Japan, gained momentum by Hiroya Kamadasan, senior consultant when he participated to Toyota Memorial Hospital 16 months ago (İpbüken, 2018). Since the mid-1990s, as China's medical reform deepened, hospitals have faced increasing pressure to improve medical quality and operational efficiency. Some Chinese hospitals have implemented lean management hospitals to improve their performance. Taihe Hospital and Nanfang Hospital are the leading hospitals that make lean management practices (Gao, & Gurd, 2019).

The lean management approach, which is the most appropriate management model for hospitals, is applied in Norway, Sweden, Denmark, USA, England, Australia and Germany. A hospital located in a rural area in the United States has reduced the duration of patients by 44%, increased the number of patients by 10%, increased the level of patient satisfaction by 92%. Lean methods have increased the morale and motivation of employees (Derin, 2018).

When lean management approach applied to infectious patients, it is realized that 90 % reduction in infection patients (Yılmaz, Alıcı, & Karaman, 2017). The necessity of the implementation of principles of lean management approach is a subject of much debate. However, the existing articles written from the past to the present day

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present a limited view of the potential benefits of lean practices in healthcare enterprises (Yıldız. S. &Yalman, 2015; Andreametteo, Lega, & Sargiacomo, 2015). This research is important in order to contribute to the adoption of health managers by examining the potential benefits of lean management.

METHODS

Research Subject

The potential benefits of lean management practices to hospital enterprises and the awareness of health managers constitute the research. This is a descriptive cross-sectional study. In Virginia Mason, the number of patients who developed ventilator-related infections as a result of lean applications decreased from 35 to 4 per year and their cardiac surgical mortality rate decreased from 4 % to 0 %12. A new model "Joint Care Model", consisting of nurses, pharmacists, administrative staff members and a doctor, has been developed by the Health Improvement Institute. With this model, 2,400 patients were cared for and improved in terms of patient satisfaction, quality performance, prescription and drug delivery errors. The senior executives currently working in all hospitals launched the lean management were included in the research without any sampling.

H1: There is a significant relationship between lean management practices and prevention of medical errors. The main purpose of lean management is to reduce costs by reducing non-value-generating activities (Rohani & Zahraee, 2015).

Virginia Mason Hospital, one of the pioneering organizations in implementing lean thinking since 2002, has achieved a 53% reduction in inventory costs in two years (Kurt, 2018).

H2: There is a significant relationship between lean management practices and cost reduction. As a result of lean management hospital applications in China, patient and employee satisfaction has increased. After lean studies at Thedacare Medical Center, patient satisfaction rates increased in 2004 (Kurt, 2018).

H3: There is a significant relationship between lean management practices and increased patient satisfaction.

H4: There is a significant relationship between lean management practices and increased employee satisfaction (Özkan, 2018).

80% of the efforts to implement lean practices are shown to change managers' mindsets, practices and behaviors.

H5: There is a significant relationship between the managers' adequate training in lean hospital and their attitudes towards lean practice.

H6: There is a significant relationship between whether managers want to do lean management practices and their attitudes towards lean practices.

FINDING

Table 1. **Distribution of Managers by Descriptive Characteristics**

Features	Variables	F	(%)
Job Titles	Hospital Manager	4	5.3
	Surgeon General	5	6.7
	Deputy Chief Pysician	22	29.3
	Financial Services Manager	4	5.3
	Deputy Director of Financial Services	18	24.0
	Health Care Services Manager	5	6.7
	Deputy Director of Health Care Services	12	16.0
	Quality Director	5	6.7
Education	Undergraduate	29	38.6
	Graduate	17	22.7
	Specialist	27	36.0
	Professor Specialist	2	2.7
Age	25-36.9	14	18.7
	37-49.9	37	49.3
	50+	24	32.0
Gender	Female	34	45.3
	Male	41	54.7
Total		**75**	**100.0**

The distribution of the descriptive characteristics of the managers included in the research is shown in Table 1. When the distribution of job titles of lean hospital managers is considered, 5.3% (4) Hospital managers, 6.7% (5) Chief Physician, 29.3% (22) Deputy Chief Physician, 5.3% (4) Financial services manager, 24.0% (18) Financial services assistant manager, 6.7% of (5) 's Health care services manager, 16.0% (12) Deputy Director of health care services, 6.7% (5) Quality Director. When the distribution of the managers according to their educational background is examined, 38.6% (29) of the undergraduate, 22.7% (17) of the master's degree, 36.0% (27) of the expert, 2.7% (2) of Prof.Dr. Dr. level of education. When the age group distribution of managers is examined, it is found that 18.7% (14) are in the 25-36. 49.3% (37) are in the 37-49. 32.0% (24) are in the 50+ age group. 45.3% (34) were female, 54.7% (41) were male.

Table 2. **Distribution of Managers According to Hospitals**

Variables		F	(%)
Number of Hospital Beds	101-200	13	17.3
	201-300	15	20.0
	301-400	14	18.7
	401-500	16	21.3
	501-600	17	22.7
Hospitals	A	13	17.3
	B	15	20.0
	C	14	18.7
	D	16	21.3
	E	17	22.7
Hospital Type	Public Hospital	62	82.7
	Private Hospital	13	17.3
Total		**75**	**100.0**

The distribution of the managers included in the research according to the characteristics of the hospitals they are assigned is shown in Table 2. When the distribution according to the number of beds of the hospitals in which the managers are assigned is examined, 17.3% (13) are 101-200 bed hospitals, 20.0% (15) are 201-300 bed hospitals, 18.7% (14) are 301-400 bed hospitals, 21.3% (16) 401-500 bed hospital, 22.7% (17) 501-600 bed hospital.

According to the distribution of managers according to the hospitals in which 17.3% (13) A: Private Medicabil Hospital / Bursa, 20.0% (15) B: Sinop Atatürk State Hospital / Sinop, 18.7% (14) C: İnegöl State Hospital / Bursa, 21.3% (16) D: Bartin State Hospital / Bartin, 22.7% (17) E: Konya Numune Hospital / Konya hospitals were found to work. When the proportional distribution of the managers according to the type of hospitals they work (State Hospital - Private Hospital) is examined, it is understood that 82.7% (62) of the managers participating in the survey are employed in the State Hospital and 17.3% (13) are employed in the Private Hospital.

Hypothesis Analysis Results

The views of hospital managers showed significant and positive relationships between;

1. the application of lean management to clinical fields and the prevention of medical errors ($p<0.05$; $r = .308$),
2. the reduction of health care costs and the prevention of medical errors in lean management ($p<0.05$; $r = .786$),
3. the increase in patient satisfaction and the prevention of medical errors in lean management, the level of employee satisfaction and the belief of lean management requires cultural change ($p<0.05$; $r = .921$),
4. the executives' sufficient training on lean hospital and their attitudes towards lean practices ($p<0.05$; $r = .420$),
5. the willingness to carry out lean management practices and the compulsion of these practices to be incorporated into regular management activities ($p<0.05$; $r = .698$),
6. the willingness to carry out the lean management practices and the proposition "Lean management practices should be incorporated into daily activities" ($p<0.05$; $r = .686$).

No difference was observed in any group when it was compared whether the managers' job titles differed according to their views on lean management practices. Significance levels were found as $p = 0.493$ and higher. One-way ANOVA results were not significant ($F = 1.409$; $P = 0.216$). No difference was observed in any group when it was compared whether the educational level of the managers were different according to their views on lean management practices. The significance level was found to be the lowest value of $p = 0.215$. One-way ANOVA was not found to be significant ($F = 1.530$; $P = 0.214$).No difference was observed between the managers in terms of whether there was a difference according to the opinions of age groups regarding lean management practices. There was no significant difference in One-Way ANOVA. ($F = 0.890$; $P = 0.415$). No difference was observed in any group when it was compared whether there was a difference in the opinions of managers regarding lean management practices compared to hospitals. Significance levels were found to be the lowest value of $p = 0.205$. There was no significant difference in one-way ANOVA. ($F = 1.704$; $P = 0.159$). No difference was observed in any group when it was compared whether there was a difference in the managers' views on lean management practices according to the number of hospital beds. $P = 0.194$ was the lowest value of significance levels. There was no significant difference in one-way ANOVA ($F = 1.595$; $P = 0.185$).

DISCUSSION

It is aimed to determine the knowledge and attitudes of the people who are currently working as managers about lean management practices. It is also aimed to determine the potential benefits of the lean management model in the field research. The implementation of lean management model is proposed in hospitals in Turkey. In this study, the potential benefits of the lean management model

and the knowledge and attitudes of the people currently working in executive positions about lean management were examined. In Turkey, the hospital executives have positive attitudes towards the lean management approach.

According to common professional view, providing lean training, carrying out pilot projects, and making improvements by establishing lean interdisciplinary teams highlighted the increase in the performance of hospitals, the satisfaction of patients and healthcare professionals, and the development of managers' problem-solving abilities. There have been major problems with hospitals in Turkey from the very beginning. It seems possible to solve these problems, if addressed not on the basis of individual hospitals but on the whole healthcare system in the country.

Lean management has an important potential to improve the performance of organizations (Andersen, 2015.). The findings of this study are line with those of some studies in the literature: Kaltenbrunner et al. (2017) found no significant difference perceptions of healthcare professionals about lean management in terms of age, gender, educational status, and job position. In the studies carried out by Özkan (2018,) and Yetgin and Sur (2017) observed no significant difference in the healthcare workers' perceptions of lean management in terms of age, gender, educational status, and job position. In the study by Yerlikaya (2015), sub-dimensions of lean management did not differ significantly depending on age and educational status. The studies supporting the proposition "Lack of support from the executives is an obstacle to the implementation of lean management" are as follows;

In the studies by Drotz and Poksinska (2014). it was emphasized that one of the challenges faced in the implementation of lean management is the lack of support from executives. Çetin (2014) asserted that, in the presence of executive support, the lean management approach could be used in every field of service sector. In our study, 68% of the executives strongly agreed with the idea "Lean management practices reduce the total health care costs" as similar with findings of some studies in the literature (Dursun, 2021; Parkes, 2015).

58.7% of participants of our study strongly agreed with the idea "The lean practices in my hospital will lead to an increase in the service quality in the long term". In the literature, there are some studies supporting this finding. Developing the lean management is one of the most important investments of the institution in terms of providing long-term improvements (Urban, 2015). There are some studies supporting the proposition "Lean management requires cultural change. Urban, (2015), emphasized the cultural change as a requirement for implementing the lean management. Parkes (2015), reported that cultural change was effective for lean practices, Furthermore, Durur (2018) found that cultural change was necessary for the lean management understanding to be fully established, and a minimum five-year period was required for accomplishing the cultural change. İlkim and Derin (2016) also found that lean practices required an understanding and cultural change. 58.7% of the executives strongly agreed with the idea of lean management practices widely used in the manufacturing industry can be transferred to the clinical procedures of hospital, İlkim and Derin (2016) also support this claim. Additionally, 36% of the participants strongly agreed with the same idea for transferring the non-clinical procedures as welli

In the study by Chiu (2016) it was found that the mortality rate in heart attacks was reduced from 22% to 2% in two years thanks to the lean practices in the cardiac care system of McLeod Health in Florence, South Carolina. 68% of participants of our study agreed with this view. 58.7% of participants of our survey strongly believed the idea of lean practices in the hospital will lead to an increase in the service quality in the long term and 41,3 % believe lean management could increase patient satisfaction. Chiu (2016) emphasized that lean practices could lead to an increase in the quality of services. There are studies in the supporting similar claim for patient satisfaction.

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