

This piece of work will critically explore lean thinking and how it has been applied to health care throughout the world, its successes and failures. It will briefly look at how illness has been viewed historically by society and how the National Health Service in Britain was implemented and has evolved, the struggles faced by the Government in funding the National Health Service and how it has adopted the Japanese model of Lean Production and translated a model created for the car industry into a health care setting to combat the financial crisis faced by the National Health Service in an effort to provide a more efficient, value based system.

To be ill was historically seen as a ‘form of deviance’ Giddens & Sutton (2013, p. 440); an ailment or condition was a matter to be kept private and dealt with by the family (Giddens & Sutton, 2013). Despite this the health, or the deteriorating health, of Britain did not go unnoticed or undocumented and in 1801 a census was carried out in the United Kingdom which recorded, amongst other things common illnesses, causes of death and life expectancy rates; since then it has been repeated every ten years incorporating more questions. Michel Foucault will argue that the reason was not to contribute towards society and create a healthy nation but that it was as ‘concerned with surveillance and discipline as it was with health promotion’ Giddens & Sutton (2013, p. 442) however the census continues to this day.

The Social Insurance and Allied Services Report published in 1942 (Ham, 2009) prepared by Sir William Beveridge promised to provide a ‘free system of medical care’ for the ‘entire population’ through national insurance contributions Burn (1943 p.514). As a result, the National Health Service (NHS) was set up in Britain in 1948 (Ham, 2009). However, even at the time of writing Sir Beveridge acknowledged that the contribution from national insurance would not cover the entire cost (Burn, 1943). In fact, in the financial year ending 2007, only one fifth of the funds for the NHS came from national insurance contributions (Ham, 2009).

The dental care which must now be paid for by those that no longer qualify and was at the time of the Beveridge Report envisaged to be received free of charge (Burn, 1943), the refusal of dentists to treat patients on the NHS due to poor payments (Dean, 1994) together with the devolving of what were once General Practitioner duties to pharmacists (Burns, 1943) demonstrates the continuing struggle to fund the NHS. Headlines such as ‘NHS financial

problems endemic and no longer sustainable, say auditors' Syal (2016); 'NHS faces biggest financial crisis 'in a generation'' Donnelly (2015); 'NHS Financial Crisis Warning' Anon (2015) to name but a few and a £1.838 million deficit for the year ending 2016 (UK Parliament, 2018) illustrates the crisis (Sobek *et al.*, 2003) faced by the NHS which needs to be addressed.

The Institute of Medicine in America reported in November 1999 that approximately 98,000 patients die in hospital each year due to medical error (Liberatore, 2011). Ivan Illich argues that there has been a rise in iatrogenesis such as MRSA as a result of medical intervention (Giddens & Sutton, 2013). He further argued that social iatrogenesis leads to more people being dependant on medicines putting a strain on the medical system arguing that the distribution of modern medicine should be reduced; furthermore he states that due to patients receiving medication from their General Practitioner which is not explained to them and the incorrect medication being given this is putting further strain on the medical profession (Giddens & Sutton, 2013). Given the rise in financial stressors and demand for better care it is perhaps not surprising that the NHS feels a reorganisation of the healthcare system is required and as it has had to find new ways to deal with these pressures that the paradigm of lean thinking is being adopted (Waring *et al.*, 2010).

Lean thinking although a relatively new concept in the healthcare industry has been practiced for some time by many companies in an effort to save money, reduce waste and to improve quality (Aherne, 2007; Sobek *et al.*, 2003). Lean thinking evolves from The Toyota Production System set up by Taichi Ohno (Castle, 2007) in the 1930s due to financial worries (Aherne, 2007). Following World War 11 the practice of lean thinking was to improve design and manufacturing in the car industry whilst saving money and using less resources (Sobek *et al.*, 2003). America adopted the technique when they saw that Japan could produce high quality goods for a fraction of the price (Sobek *et al.* 2003), statistics showed not only an increase in productivity but a quarter less defects in products (Castle, 2007). It was believed that lean thinking could 'have a profound effect on human society' changing 'the world' (Womack *et al.*, 2007 p. 6). Narasimhan *et al.* (cited in Narayanamurthy *et al.*, 2017) 'defined leanness in the context of manufacturing as the accomplishment of production with minimal waste due to unneeded operations, inefficient operations, or excessive buffering in operations' whilst Popadopoulos (2011) will state that lean thinking is constituting 'an innovative philosophy

which aims at using fewer resources' and involves 'tools and techniques at an operational level'.

Lean thinking consists of five concepts. (Folinas & Faruna, 2011; Waring et al., 2010; Campbell, 2009). The first is to provide value to its customers, this is by taking heed of what the customer or in a healthcare setting the patient desires and wants from their service provider (Campbell, 2009). Although this piece of work is concerned primarily with healthcare the Government's implementation of multi-agency work illustrates this, encouraging agencies to work together thereby reducing the amount of paperwork that is required to be completed by the person being treated creating a better service for them (Multi Agency Working and Information Sharing Project, 2014). The second is to stream line approaches (Folinas & Faruna, 2011) or 'value stream' (Campbell, 2009), this focuses on identifying tasks that have no value and removing them from the system; this has been implemented in emergency departments and the NHS has provided guidelines on how to improve patient flow providing guidance on ten good practice areas (Good practice guide : Focus on improving patient flow, 2017), this also includes eliminating waste once it has been identified (Carter, 2013; Folinas & Faruna, 2011). The next is flow (Campbell, 2009), this would create value to the service being offered reducing waiting or queuing times (Campbell, 2009) and create a better relationship between the patient and the treatment provider (Folinas & Faruna, 2011) and eliminate barriers that prevent a flow (Castle, 2007). The fourth area is what is described as 'pull' (Campbell, 2009), this is having the tools available to do the job on site for when they are required (Campbell, 2009) and allowing the employees to have a say in what they feel will improve the service (Castle, 2007). The final area is to strive for perfection (Folinas & Faruna, 2011; Waring et al., 2010) this focuses on, as it suggests, perfecting tasks so that those that are working are continually improved and those that are not are discarded (Castle, 2007). Lean thinking is described as not 'working harder' but rather 'working smarter' Munro (2009 *cited in* Bhat, 2014). The NHS in Britain have taken on these values wanting to remove 'activities that don't add value' and promoting 'respect for people and society... at the heart of healthcare' (NHS Confederation, 2006).

Lean thinking in healthcare was first used in hospitals in America (Bushell and Shelest, 2002 *cited in* De Souza, 2009). The approach has been used since 2005 in Britain in the healthcare

sector (Popadopoulos, 2011) being ‘enthusiastically adopted’ McCann (2015) to alleviate the financial pressures on the NHS (De Souza, 2009). Aherne (2007) will state ‘the focus of lean thinking in health care is on improving flow among activities of ‘core value’ to organisations, and on individual patients and their journeys’. The NHS in England (n.d.) has adopted not only Lean thinking but has also taken on board the Six Sigma framework (England.nhs.uk., n.d.) or sometimes known as the Five Sigma (Waring et al, 2010) which was developed by Motorola during the 1980s encompassing ‘sort, straighten, scrub, safety, standardise and sustain’ Folinas & Faruna (2001) and a combination of both the Six Sigma Technique and Lean it is argued will not only increase efficiency and speed but will also provide a more effective way of avoiding mistakes. To go into detail about the six sigma or five sigma would be outside the scope of this piece of work given the word count.

As stated above lean thinking has been implemented in many health care settings with a number of studies being carried out as to its success or failures. Bolton NHS Trust adopted the lean technique in 2005 entitled the ‘Bolton Improving Care System’ (BICS) (Davis, n.d.). Their focus, by adopting the Toyota Production System, was on reducing waste and improving service to patients (Davis, n.d.). David Hamer, Professional Lead for Laboratory Medicine at the hospital emphasises the need to reduce waiting times and to extinguish the need to carry out tasks that do not add value and given his expertise in the hospital identified the transporting of blood samples as a cause for concern thereby feeling the process needed streamlining to reduce waste and wasted time (The Nuffield Trust, 2012).

McCann, (2015, p. 1572) in their three-year study of a hospital describes lean thinking as a ‘fad’ creating ‘widespread dysfunction and employee disengagement’ (Carter *et al.*, 2011, 2013 *cited in* McCann, 2015) despite the NHS Confederation’s statement in 2006 stating it was not (NHS Confederation, 2006). Dr Ian Dufton (*cited in* Davis, n.d.) states that persistence is necessary and describes his early experiences of lean thinking as disastrous. David Hamer states that engaging staff is difficult and that a percentage of staff, in his opinion, will be resistant to change (The Nuffield Trust, 2012) this is echoed by much research and the importance of input and feedback of the staff has been identified as essential for lean thinking to be achieved (Collins, 2015; NHS Confederation, 2016; D’andreamatteo et al., 2015; Waring et al, 2010) which in turn results in ‘staff empowerment’ and ‘continuous improvement’ De Souza (2009). Conversely Nigel Edwards, Policy Director of the NHS Confederation writes

that clinicians are ‘involved and enthusiastic’ NHS Confederation (2016, p.2) and Paul Boocock, director of estates and facilities Management at Torbay Hospital is quoted in the media as stating that staff have reported ‘better job satisfaction’ when the lean thinking has been adopted (Anon, 2011) and the original study by the Massachusetts Institute of Technology reported that due to input from staff and rotating the workforce this resulted in less staff absenteeism (Castle, 2007).

The NHS Confederation (2006) acknowledge lean thinking as being a ‘medium to long term’ solution. Early results collated from the Bolton Hospital some four years after its implementation were poor and mortality rates only fell to the national average five years after lean thinking was implemented (Davis, n.d.) showing it is not a quick fix for the medical profession and this may account for the negative findings in the study carried out by McCann. The lean thinking programme even in Bolton’s success story is not without its flaws, and critics could point out that although the patients participated in the process to identify what mattered to them, as would be required by one of the lean thinking principles, the study confirms that ‘selected participants’ were invited to share their story (Davis, n.d.) with no explanation as to how these patients were selected this may have an impact on their findings.

Castle (2007), studying the lean thinking philosophy on a gastroenterology ward found that by having ample stock on a hospital ward it reduced the time required for staff for re-ordering goods or attending other wards to obtain the materials they required which they estimated as being approximately 1,800 minutes a month. In addition, in an intensive trauma unit they found by keeping stock in order and having a suitable re-ordering system in place for stock that has been diminished this avoided waste (Castle, 2007). They argued that the lean technique could be applied to any healthcare setting and none of the ‘endpoints could be construed as being negative for either the patient or the employee’ (Castle, 2007). Although Castle is quoted in many works and whilst the argument sounds persuasive as do the statistics and results the study is approached with caution as the author was employed by a consultancy firm and it would be in their interest to show positive results to gain more work. David *et al.* (2010), in their study implementing the lean technique in an emergency department in Canada found that patients who left the department without being seen decreased by nearly three percent, the time taken to discharge patients decreased by nearly an hour and that patients scored higher for

satisfaction. While Collins (2015) found that adopting the Toyota Production System enhanced the ‘competitiveness in terms of quality and cost advantage’ of a hospital in Illinois.

Sobek *et al.* (2003) applied the Toyota Production System to a community pharmacy in America due to the senior manager’s concerns about customer service and errors. Their study showed that the use of the lean thinking model was advantageous but again identified a number of difficulties in its implementation. It was concerned that once the research assistant that had been sent to the pharmacy to assist in streamlining the process was removed whether the pharmacy would be able to continue to collect data to assist in bringing the project forward (Sobek *et al.*, 2003) which is a concern that has been raised in other research (Taylor *et al.*, 2013) and although this is a valid concern it is unlikely that NHS Trusts would in fact have the ability, due to time constraints to actually identify the flaws in a system that the student in the research was able to do as this was their primary concern. Secondly, due to the low number of staff being involved and the training that would be required for other staff at the pharmacy to make them aware of the process may result in failure (Sobek *et al.*, 2003) and with the need for the process to be measured continually and reflected upon (Taylor *et al.*, 2013) and to be constantly reviewed (Narayanamurthy *et al.*, 2017) to make further improvements to strive for the perfection required under the lean philosophy the lack of the student may certainly have an impact on the success of the pharmacy and their ability to continue with their lean thinking process. Finally, the lack of understanding of the process by other departments they felt would have a negative effect on the pharmacy’s ability to continue with the lean thinking strategy (Sobek *et al.* 2003) as is echoed in other research (D’andreamatteo *et al.*, 2015) and the NHS’s assertion that the ‘whole process’ needs to change (NHS Confederation, 2006).

Time to implement such practices as discovered by Sobek *et al.* (2003) and Edwards (NHS Confederation) are troublesome. In order to put in place lean thinking the system must first be studied and broken down (Seddon, 2011; Sobek *et al.*, 2003) with time being crucial in any healthcare setting and certainly within the National Health Service with training required (Waring *et al.*, 2010) sometimes over a number of days (David *et al.*, 2010) although the long term advantages may be attractive in the short term the financial crisis may not allow these steps to be taken. Furthermore some will argue that the Toyota Production System is not really understood and certainly not suitable in a health care setting (Taylor *et al.*, 2013).

In conclusion, The Toyota Production System or what it has become to be known as Lean Thinking is not without its critics and there are certainly flaws in the system as explained above. It has been labelled as a 'fad' Carter *et al.*, (2011, 2013 *cited in* McCann, 2015), and Coffey (2007) argued that the Toyota Production System is a mere myth which Toyota themselves no longer adheres to; that the lean system is confusing and unclear (Taylor *et al.*, 2013) while others argue it is a breakthrough and the way forward (Waring *et al.*, 2010). With employees fearing that by implementing lean thinking which advocates fewer resources (Sobek *et al.*, 2003) this will result in them losing their jobs (Kim *et al.*, cited in D'andreamatteo *et al.*, 2015); the shortage of staff (The King's Fund, 2018); the fact that approximately twenty percent of staff will resist change (Nuffield Trust, 2012); coupled with the possible creation of a hostile environment in a health care setting due to the implementation of new procedures (Mehri 2006 *cited in* Taylor *et al.*, 2013) and the difficulty of the NHS to recruit managers (The King's Fund, 2018) then perhaps the label of 'fad' (Carter *et al.*, 2011, 2013 *cited in* McCann, 2015) or wondering if the current trend is a 'a management fashion or a valuable philosophy' DeSouza (2009) is understandable. However D'andreamatteo *et al.* (2015), writing in 2015 will state that whilst further research needs to be carried out on lean thinking in a health care setting the current evidence is positive and with the National Health Service promoting lean thinking (NHS Confederation, 2006) it is certainly a long way from being abandoned by the Government or the National Health Service and time will tell if it remains at the forefront and is a way of solving the current financial situation within the NHS while still providing good quality service for patients.

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