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Original Research Article

The aftermath of "Beirutshima": the role of nursing quantum leadership in primary health care centers

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ABSTRACT

Background: The healthcare system in Lebanon faced unprecedented challenges following the COVID-19 pandemic and the devastating beirut blast on August 4th, 2020. The aftermath highlighted the system's vulnerability, corruption, and incapacity to provide essential services, leading to an urgent need for leadership transformation within primary healthcare centers (PHCs).
Methods: This qualitative cross-sectional study assessed the quantum leadership skills of nurses in 30 PHCs within a 5-kilometer radius of the blast site. Data were collected six months post-blast using a self-administered questionnaire based on a binary outcome scale of agreement and disagreement, analyzed with IBM SPSS-19 software to evaluate the potential for leadership improvement.
Results: The findings indicate a significant correlation between quantum leadership skills and the operational effectiveness of PHCs, particularly those managed by the Ministry of Public Health, which exhibited superior quantum leadership skills compared to others.
Conclusions: The study underscores the necessity for a new leadership paradigm rooted in quantum theory to navigate the healthcare system through crises effectively. A quantum leader, characterized by heightened organizational consciousness and energy, is pivotal for ensuring a seamless transition towards recovery and resilience, ultimately fostering a breakthrough in the face of systemic breakdowns.

Keywords: Beirut blast, Lebanon healthcare system, Primary healthcare centers, Quantum leadership, Systemic change

INTRODUCTION

The devastating explosion in Beirut on August 4, 2020, marked a pivotal moment for Lebanon, reflecting the culmination of longstanding systemic vulnerabilities. This event, deeply akin to the severity of the Hiroshima bombing and referred to as "BeirutShima," underscored the fragility of Lebanon's infrastructure, particularly its healthcare system. The explosion not only caused immediate destruction but also laid bare the compounded challenges faced by Lebanon over decades. The influx of

Palestinian refugees since 1948, followed by Syrian refugees in 2011, which increased Lebanon's population by 30% by 2013, and the protracted conflicts with Israel have continuously strained the nation's resources and systems.[1] Among these, primary healthcare centers, vital for early detection and prevention of diseases, have been severely impacted.[2]

This backdrop of repeated crises has necessitated a re-evaluation of the resilience of Lebanon's healthcare system. As articulated by Laszlo, societies at a crossroads must choose between stagnation leading to collapse or transformative action leading to resilience.[3] In the wake of the Beirut explosion, this research aims to assess the capacity of Lebanon's primary healthcare centers to withstand and adapt to such profound shocks.

Conducting a qualitative cross-sectional, descriptive, and analytical study among 50 primary healthcare centers within a five-kilometer radius of the Beirut port explosion site, this work seeks to understand the immediate effects of the explosion on healthcare delivery and explore pathways for building a more resilient health system in the face of ongoing and future challenges.[4]

Quantum theory in healthcare

Reflecting this into the healthcare level, there is a need to shift from the individual level to the planetary level (the macro-shift). A pattern with a certain autonomy, decentralization (quantum superposition and entanglement), integration and a new leadership style (quantum leadership and quantum tunnelling) will continuously improve the quality of care, reduce the cost, and this constitutes the simple systems (micro-systems) which in its turn represents in its detailed elements the complex systems. Healthcare systems are complex systems made of simpler systems. Those systems are made of patterns. Complex systems function in synchronization when the simple systems are functioning properly. Simple systems respond collectively to change and fluctuations, known as the macro shift.[5] According to Braden, at the micro-level, people are the containers of all things. In our model, nurses with quantum characteristics are connected in time and space, which resembles the connection between primary healthcare centers at a micro-level. At the meso-level (group level), those interconnections are also connected to the whole complex healthcare system, and to the universal field represented by the population needs at the macro-level.[6] Primary healthcare centers are known to be complex structures and function in a non-linear dynamic bio-system. This allows healthcare workers to see themselves as interconnected and interacting participants in the healthcare endeavour.[7] Applying the quantum theory to healthcare systems a shared consciousness is reached among all people, which will save people from potential extinction. However, change is multi-dimensional and should be initiated from within. This is completed through training and education of frontline managers mainly nursing staff by strengthening their autonomy in decision-making and quantum leadership skills. This will motivate employees and improve their performance, profitability, and productivity.[7] The traditional organization performs at the rim of balance, but quantum organizations perform at the rim of chaos.[8]

Quantum leadership and leadership skills

Quantum leaders are leaders who can motivate the employees in a way that transforms the organization into an exceptional organization in terms of productivity, performance, and profitability. According to the quantum theory, a quantum leader is characterized by seven quantum skills demonstrated and detailed in **Error! R eference source not found.**.[9]

Table 1: The seven quantum leadership skills.

Quantum seeing	**Reality is a subjective matter**
	Realization of a leader's purposes, where purposes are changed according to perceptions of the surrounding
	Engaging employees with the planning and visioning[10]
	Ensuring that the organization has an aim, purpose, an action plan, and a sense of direction
Quantum knowing	Ability to know intuitively, like meditation[8]
	New kind of learning organization to develop mindful decision-making through intuitions[11]
Quantum feeling	Ability to feel active
	Focusing on the positive aspects of the all right events instead of organizational problems[12]
	Ability to trust the personality, creativity and abilities they bring to the organization[13]
Quantum thinking	Ability to think adversely
	Ability to look for new solutions, thus creating quantum organizations
	Creating job diversity, diverse behavioral style and have different values and interests as well as cultural cohesion
	Critical to implement creative and mindful thinking[14]
Quantum acting	Ability to act accountably
	Each part impresses and is impressed by other parts
	Ability to plan the purposes that are good for the leader and the organization.

Continued.

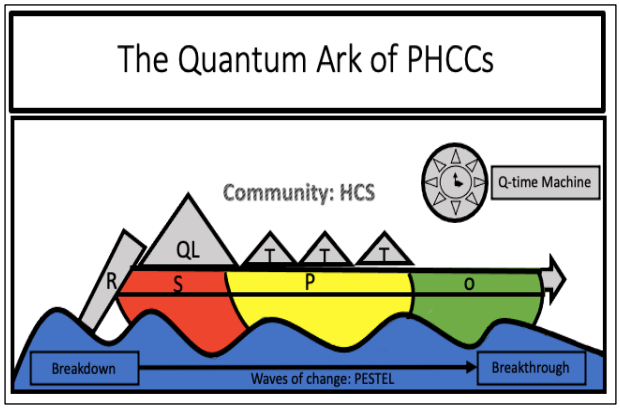
Quantum seeing	**Reality is a subjective matter**
	Realization of a leader's purposes, where purposes are changed according to perceptions of the surrounding
	Engaging employees with the planning and visioning[10]
	Ensuring that the organization has an aim, purpose, an action plan, and a sense of direction
	Ability to secure kindness, compassion and integrity. Thus, enabling coordination, communication and connectedness between simple systems[15]
Quantum trusting	Ability to trust life's process expressed in chaos
	Using this skill is difficult due to challenges in traditional organizations
	Ability to create new organizational processes and present self-organizing employees to attain organizational goals[16]
Quantum being	Suggesting that the world has the nature of relationships and the possibility of an association with particles and the possibility of relationships[16]
	Ability to create a new environment of horizontal and vertical communication, hierarchy with a mixture levels "heterarchy" between employees with no restrictions[17]
	This interaction produces invisible positive energy in the organization.

The quantum ark of primary healthcare centers

Laszlo described the chaotic situation, which is at a bifurcation point, after this phase, there are two possible scenarios, either a breakdown or a breakthrough. The first is called business as usual, which will lead the system to spiral down and collapse, this phase four is called the breakdown phase. The second scenario is defined by the timely transformation where people are the agents of change, at this critical point there is a need to shift into a stable state. He refers to Macro shift, a shift from the individual level to the planetary level, at the bifurcation point.[3] In addition, the current COVID-19 global pandemic, that is creating a fundamental transformation in human interpersonal global relations and science. The effect of COVID 19 is multi-dimensional, unlike any other in the last 75-year history of the United Nations existence, COVID-19 is not only affecting societies at their core but also bringing about new behavioural patterns aimed at combating this disease ("stay home, stay safe" slogan).[18] In the aftermath of all this chaos, it is crucial for traditional organizations to shift to a creativity and innovation orientation. These organizations must be changed to perform at the rim of chaos.

The quantum ark **Error! Reference source not found.** r epresents Lazlo's theory and its impact on primary care centers. Primary care centers, as part of the healthcare system, is impacted by the continuous waves of change, defined through the PESTEL analysis. The PESTEL analysis takes into consideration the political, economic, social, technological, environmental and legal waves of change that impact a healthcare system in specific and any operational system in general.

Error! Reference source not found. is a multi-d imensional vessel to shift the vision, values, mission, and goals (the macro shift) from the breakdown phase to a breakthrough of the primary health care centers.



HCS: Health Care Services, R: Resources, QL: Quantum Leadership, T: Team Members, S: Structure, P: Process, O: Outcome

Figure 1: The quantum ark of primary healthcare centers.

The Lebanese primary healthcare system

Primary health care is considered the core of the health systems and is based on the principles of justice, equality, and rational use of resources. However, this reality differs from the axiom, given that the Lebanese health care system is oriented towards curative care whereby the strategy was very expensive and unsuccessful.[19] At the community level, the system is highly centralized, the decision-making is at the level of the elites. Bureaucracy excludes people from any decision making, and partnership is necessary for success.[20] Primary healthcare is provided either through private clinics or through a network of primary health centers, which are mainly run by non-governmental organizations.[2,21]

It is estimated that there are around 850 health centers across Lebanon. The Ministry of Public Health network includes 204 primary health care centers. Ministry of

Social Affairs Social Development Centers (SDCs) include 220 centers. Around 700 centers are dispensaries, 250 of those centers have contracts with the Ministry of Social Affairs to deliver health and social services, known as Social Development Centers (SDC) (Abdel-Latif, 2006). Services provided by those centers include trauma care, mental health services, and essential drugs.

The waves of change hitting the healthcare system are multi-dimensional and include the political, economic, social, technological, environmental, and legal dimensions. The political wave has been hitting Lebanon since 1948, when tens of thousands of Palestinian refugees came to Lebanon to live in camps set up by the United Nations Relief and Welfare Agency (UNRWA). In addition to the ongoing conflicts with Syria and Israel. This was followed by the civil war that ravaged the country between 1975 and 1990, which slowed down the financial input to PHC. Inflation in the Lebanese economy limited health care resources. In 2011, Syrian refugees fled to Lebanon and increased the population by 30%. The multi-dimensional impact of COVID-19 pandemic has also shaken the Lebanese health care system tremendously. Legal factors have also contributed to the hastening of the health care system, from fraud to corruption to abuse. In addition to all the factors contributing to the collapse of the defenseless health care system, the explosion of the Beirut port or "BeirutShima" blew the capital and its surroundings. With a tragic event, similar to Hiroshima bombing, Lebanon's capital transformed into a huge emergency room, providing nothing but the most basic needs to its patients. Hospitals of the area were destroyed, and had to cope with the waves of injured, with limited to null resources. All hospitals were overloaded, and the PHCCs were paralyzed, unable to play any role in the response phase, not even basic trauma care, basic life support, or mental health and financial stress support of healthcare personnel.[21-26]

This study aims at assessing the importance of quantum skills in nursing leadership at primary care centers in Beirut. It allows us to shed light on the response of nursing team towards massive and rapid changes occurring in reference to their quantum leadership skills.

METHODS

Study design and period

This research is a qualitative cross-sectional, descriptive, and analytical study conducted six months post the Beirut blast, from February 2021 to July 2021.

Study setting

The study encompassed 30 primary healthcare centers (PHCCs) located within a five-kilometer radius of the Beirut port explosion site. These centers were selected due to their critical role as the first line of response following the blast. The PHCCs were categorized based on their managing authority: 10 operated by the Ministry of Public Health, 10 by the Ministry of Social Affairs, and 10 by Non-Governmental Organizations.

Participants selection

All PHCCs within the specified radius were assessed for eligibility. From each eligible center, five nursing staff members were selected to participate, totalling 147 participants. The selection criteria focused on ensuring a diverse representation of experiences, roles, and responsibilities within the nursing staff.

Data collection procedure

A self-constructed questionnaire, inspired by the Gallup StrengthsFinder framework, was employed to assess Quantum Leadership skills among the nursing staff. This tool was chosen for its emphasis on identifying strengths, aligning with the positive mindset central to quantum leadership. The questionnaire evaluated seven quantum leadership skills: quantum seeing, quantum knowing, quantum feeling, quantum thinking, quantum acting, quantum being, and quantum trusting, using a binary outcome scale of agreement. Participant demographics, including sex, age, marital status, education level, years of work experience, years of managerial experience, and leadership training courses attended, were also collected.

Ethical approval for this study was obtained from the relevant ethics committee. Participants were informed about the study's aim and assured of their anonymity and confidentiality. Informed consent was obtained from all participants prior to data collection.

Statistical analysis

Data were analyzed using IBM SPSS-19 software. Quantum leadership skills were categorized as low (less than 50% agreement), moderate (between 50-75% agreement), and high (more than 75% agreement). The hypothesis tested was whether a significant relationship exists between the studied Quantum Leadership Skills. Correlation analyses were conducted to explore the relationships between leadership skills and the effectiveness of the healthcare response.

RESULTS

Participants in this study are considered representatives of the Lebanese Primary Care Centers since they constitute 75% of the operational Primary Care Centers in the Country, in reference to their days of operation and number of beneficiaries of their services.

Based on the gamma measure of association test, which is a useful tool for studying the relationship between two ordinal variables and can provide valuable insights into patterns and trends within the data, the results did not show any significant pairwise association between variables.

Due to the lack of normality assumptions about the data, non-parametric tests were performed to decide whether a significant difference exists between our variables. The Kruskal Wallis test, usually used to compare medians among multiple independent groups was also conducted to check if a significant difference exists.

Table 1, was also conducted and was found to be the most significant whereby the results described below show that quantum seeing, knowing, feeling, and thinking are highly correlated. This is verified through the positive value close to 1 in the table below. A strong correlation also exists between quantum being and trusting visible below. However, this is not applicable on quantum acting which has a negative correlation with all other studied skills.[30,31]

A Pearson correlation, demonstrated in

H0: There is no significant correlation between Quantum Leadership Skills

H1: There is a significant correlation between Quantum Leadership Skills.

Table 1: Pearson correlation between studied quantum skills.

	Quantum seeing	Quantum knowing	Quantum feeling	Quantum thinking	Quantum acting	Quantum being	Quantum trusting
Quantum seeing	1	0.763**	0.869**	0.714**	-0.115	0.648**	0.481**
Quantum knowing		1	0.737**	0.606**	-0.092	0.552**	0.430*
Quantum feeling			1	0.876**	-0.146	0.601**	0.509**
Quantum thinking				1	-0.212	0.538**	0.33
Quantum acting					1	0.371*	0.023
Quantum being						1	0.322
Quantum trusting							1

**Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed)

Demographic data was also studied and generated in this study and show that most participants were females a total of 77 participants (52%), and the remaining were males (48%). Majority of females aged between 21 and 30 years old, whereby most males were aged between 51 and 60 years old.

Majority of participants hold a master's degree, 50% of males and 37% of females. The remaining were holding bachelor's and PhD degrees.

Since different centers were studied, the comparison between them was also conducted at the total quantum leadership level and at each quantum skill specifically. The Ministry of Public Health centers were characterized by the highest level of quantum leadership, followed by Non-Governmental Organization centers and Ministry of Social Affairs centers respectively.

90% of Ministry of Public Health primary healthcare centers (9 centers), have a quantum leadership score of more than 75, indicating good Quantum leadership skills. And 10% (1 center) have a score of 50-75 meaning that they have intermediate quantum leadership skills.

40% of non-governmental organizations dispensaries (4 centers) have a score of 75 and above, 50% (5 centers) of those centers have a score of 50-75, and 10% (1 center) have scores less than 50, indicating minimal quantum leadership skills.

Ministry of Social Affairs Social Development Centers have the lowest quantum leadership score compared to the other centers. 30% of Ministry of Social Affairs Social Development Centers (3 centers) have a leadership score of more than 75, whereas 60% (6 centers) have a score of 50-75 and 10% have a score less than 50.

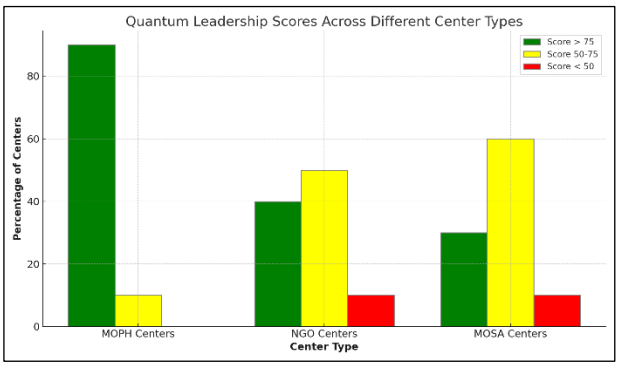


Figure 2: Distribution of quantum leadership scores in Lebanese primary healthcare centers.

A non-quantum leadership skill was also tested using a specific section of the questionnaire and results show that as the score in this section increased, the Quantum leadership skills of a participant decreased. All centers score almost the same in being non-quantum leaders, due to the fact that the majority of the three different types scored between 50-75.

DISCUSSION

The present study provides a comprehensive analysis of Quantum Leadership skills among nurses in Lebanese Primary Healthcare Centers (PHCCs), with a focus on how demographic characteristics, educational background, and training influence these skills. Notably, the study found that female participants scored higher in quantum seeing, feeling, thinking, acting, and trusting than their male counterparts, which may reflect inherent gender-related attributes such as multitasking efficiency.[28] This finding aligns with existing literature on gender differences in leadership, suggesting that women often exhibit leadership styles that emphasize empathy, collaboration, and emotional intelligence.[29]

Age was identified as a significant factor, with participants in the 21-30 age group demonstrating superior quantum Leadership skills. This indicates that younger healthcare professionals are potentially more adaptable and open to embracing innovative leadership approaches, a crucial trait for navigating the complexities of healthcare environments.[28]

Educational attainment played a pivotal role in the development of quantum leadership skills. Participants with higher educational degrees generally exhibited stronger quantum skills, with the exception of quantum acting. This particular skill was most pronounced among participants holding a Bachelor's degree, suggesting that practical leadership abilities might benefit from hands-on experience and specific training rather than academic achievement alone.[29]

The study also highlighted the positive impact of work experience and leadership training on enhancing quantum leadership skills such as seeing, knowing, and thinking. These findings underscore the value of continuous professional development and targeted leadership training programs in cultivating effective leadership qualities.[30]

Furthermore, the analysis revealed a nuanced interplay among various quantum leadership skills. While quantum seeing, knowing, feeling, and trusting showed significant positive correlations, suggesting a synergistic relationship between intuitive and acquired skills, quantum acting was negatively correlated with the other quantum skills. This suggests a potential conflict between traditional leadership behaviours and the holistic, adaptive approach required by quantum leadership.[31]

Comparative analysis across different types of PHCCs indicated that Ministry of Public Health centers outperformed NGO and Ministry of Social Affairs centers in quantum leadership skills. This disparity may be attributed to the structured training and accreditation processes in place at Ministry of Public Health centers, highlighting the importance of institutional support for leadership development.[28]

The study's findings suggest that quantum leadership skills are crucial for enabling nurses to effectively respond to the dynamic challenges facing the Lebanese healthcare system. Enhancing these skills through education, training, and experiential learning can significantly contribute to the resilience and adaptability of healthcare providers, particularly in contexts marked by continuous change and uncertainty.[30]

In conclusion, this study underscores the necessity of developing quantum leadership skills among healthcare professionals in Lebanon. By fostering these skills, the healthcare system can enhance its capacity to navigate the complexities of modern healthcare delivery, ensuring a responsive and effective response to both current and future challenges.

Primary healthcare centers constitute the 1st point of contact with the HCS. They operate in a uni-directional model consisting of a structure, process and outcome skeleton. The structure includes a place, provisions, and most importantly people's knowledge, skills, and motivation. The process is a transaction between healthcare workers on one hand and patients and population on the other hand. Processes include evidence-based practice, quality of care, and standardization of protocols like accreditation. The outcome is the service provided, value-based change in the delivery system in general. In Lebanon, primary healthcare centers include private, non-governmental organizations, and governmental institutions. The private sector dominates health service provisions. Primary healthcare centers are a major component of the healthcare system. Like improving quality of care by an accreditation of primary healthcare centers in 2009, evidence-based practice, health information system, global capitation, and social packages, this weak and vulnerable healthcare system, including primary healthcare centers, is repeatedly exposed to multiple shock waves, thus hastening its ultimate collapse and breakdown, which represents the chaotic phase. These shock waves are becoming faster and stronger.

To reach the stable phase of breakthrough, there is a need for a new behavioural pattern that can perform at the rim of chaos, rather than the rim of balance. In the whole healthcare system, people are the most important component, are agents of change, not simply obedient agents, but teaching, educating, and training they have received little or no attention. A new leadership style including anticipation, intuition, spirituality, creativity, positive psychology, risk-taking, and conflict resolution leading to a holistic approach based on quantum theory. This quantum leader is created, through mutation and evolution (quantum biology), from within the system because of quantum physics phenomena as tunnelling (creating new solutions), entanglement (teamwork), and superposition (coordination, communication, and connectedness). The quantum leader will fix the weaknesses and cracks in the system to make it more

resilient to the multidimensional shock waves by creating a hologram, the primary healthcare centers. This hologram will be connected to another hologram-like secondary, or tertiary care, to form the super-hologram, the entire complex health care system. Connectedness between the different simple systems of the quantum matrix is "heterarchy" rather than the traditional hierarchy. The quantum ark is a multi-dimensional vessel to shift the vision, values, mission, and goals (the macro shift) from the breakdown phase to a breakthrough of the primary health care centers. Where values are based on the definition of primary healthcare. The vision is based on the 5 principles of primary healthcare. The mission is based on the Alma-Ata declaration. The Goals are based on the 8 components of primary healthcare, and teamwork is based on the components of the health care team which all together will form the quantum time machine. During this critical era, the quantum leader will build the Quantum Ark to save the system from the breakdown and reach the breakthrough phase of salvation.[25-28]

Limitations of this study include the availability of nurses who were directly impacted and involved with the Beirut Blast response, since shortly after the Blast, nurses immigrated searching for stability and better opportunities. This limitation was mitigated through expanding the pool of participants. Statistical limitation was also present, which was characterized by the deficiency of literature review that allows us to create a baseline for our study results.

CONCLUSION

This study significantly advances the field of healthcare leadership by delineating the impact of quantum leadership skills among nurses in Lebanese Primary Healthcare Centers, highlighting the pivotal role of demographic characteristics, educational backgrounds, and training. It uncovers nuanced insights into how gender, age, and education influence leadership capabilities, with findings that female nurses and younger healthcare professionals demonstrate superior quantum leadership skills. This research not only challenges traditional leadership paradigms by showcasing the effectiveness of quantum leadership in navigating the complexities of healthcare environments but also emphasizes the importance of continuous professional development and institutional support in fostering these skills. By illustrating the critical need for a holistic, adaptive leadership approach in the face of Lebanon's healthcare challenges, the study contributes to a deeper understanding of leadership development in healthcare settings, offering a foundation for future initiatives aimed at enhancing leadership resilience and efficacy within the sector.

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