

ISSN 1918-7173 (Print)
ISSN 1918-7181 (Online)

Review of European Studies

CANADIAN CENTER OF SCIENCE AND EDUCATION®

Vol. 15, No. 4 December 2023



REVIEW OF EUROPEAN STUDIES

An International Peer-reviewed and Open Access Journal for European Studies

Review of European Studies (ISSN: 1918-7173; E-ISSN: 1918-7181) is an open-access, international, double-blind peer-reviewed journal published by the Canadian Center of Science and Education. This journal, published quarterly (March, June, September and December) in both print and online versions, keeps readers up-to-date with the latest developments in all aspects of European studies.

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Impact of Ecological Momentary Interventions on Regulatory Strategies of Perceived Stress at Work: An Exploratory Study Based on the Application "MON SHERPA" Used in an Ecological Context

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Received: March 21, 2023 Accepted: July 18, 2023 Online Published: November 15, 2023

doi:10.5539/res.v15n4p1

URL: <https://doi.org/10.5539/res.v15n4p1>

Abstract

Based on ICT, specifically smartphones and their mobile apps, this exploratory study questions the impact of EMIs on employees' perceived stress during workdays. A sample of 15 workers, working at least 3 days a week and divided into one control group (n=5) and one experimental group (n=10), used an EMI application called "Mon Sherpa" for one week. Participants responded to two questionnaires at the beginning of the study: a sociodemographic questionnaire and the PSM-9 (Psychological Stress Measure). They completed the PSM-9 once again in the middle and at the end of the experiment to compare the score's evolution depending on the formed groups. Additionally, semi-structured interviews were conducted with participants of the experimental group (n=9) to identify their perception of the application. The statistical results indicated no effects of the EMIs. However, interviews indicated somatic, behavioral, and cognitive evolution throughout the experiment in the field of stress, anxiety, and invasive thoughts. These conflicting results might be explained by an immediate but not lasting effect of EMIs on work-related stress. It may also be partly explained by some limitations of the study. More cross-disciplinary and larger research is required.

Keywords: information and communication technologies, ecological momentary intervention, worker well-being, perceived stress, ecological study

1. Introduction

Technologies are a source of hope for improving well-being and health at work (Del Rio et al., 2017). Among these, Ecological Momentary Interventions (EMIs), defined as a set of methods associated with clinical treatment in an ecological context (D'Alfonso, 2020), intervene notably in various psychological and psychiatric problems such as anxiety, depression, OCD (i.e., Obsessive-Compulsive Disorder), and post-traumatic stress (Van Ameringen et al., 2017; Linardon et al., 2019; Schueller et al., 2017). The EMIs, experiencing an expansive increase in the market (Van Ameringen et al., 2017; Myin et al., 2018), can take many forms, ranging from simple clinical recommendations (e.g., relaxation techniques in stressful periods) to more formal and structured interventions (e.g., recall and motivational messages during the withdrawal phase of smoking).

Studies investigating the effects of the use of EMIs are not consistent. Some studies suggest benefits to individuals related to reduced anxiety after treatment with EMIs (e.g., Economides et al., 2019). Other studies have, on the contrary, shown a decline in the effects of the EMI over time (e.g., Baer et al., 1988; Rodgers et al., 2005; Vidrine et al., 2006) or their stagnation (e.g., Kenardy et al., 2003).

Furthermore, this recent theme was mostly investigated in the research of clinical psychology as a monitoring tool for the patient's progress (e.g., Donker et al., 2013; Torous et al., 2014). This limitation of EMI use to existing therapy leads to question a new standpoint concerning the EMI (e.g., Donker et al., 2013; Torous et al., 2014) and its potential contribution to the work context. As a matter of fact, we observe few research regarding the inclusion of applications promoting health, performance, and well-being at work (van den Heuvel et al., 2009; Robroek et al., 2010; Wierenga et al., 2013). Also, few studies explicitly address work-related stress, defined as a state occurring when an employee's perception of their own effort doesn't answer the actual reward obtained for their work (Siegrist, 1996). However, the presence of stress at work is a major issue, as the distress caused by the demands of work, burnout, and organizational pressures are significant nowadays (e.g., Bartlett et al., 2019). As a result, there is a real need to expand research on this subject, especially in other spheres such as work psychology.

This paper aims to characterize the effects of EMI on the stress regulation strategies developed by operators in a real work context.

The article is organized as follows: Section 2 presents the theoretical background underlying the dimension of EMIs. Section 3 clarifies the purpose and assumptions of the study. Section 4 details the research protocol based on a mixed methodology. Section 5 presents the main results of our study in relation to the hypotheses mentioned above. In section 6, a discussion puts our results in perspective in relation to the scientific literature. In conclusion, new research perspectives are proposed

2. Theoretical Background

2.1 Definition of EMIs

EMIs are characterized as part of the three possible uses of AI, next to digital phenotyping and language and chatbot analysis (D'Alfonso, 2020). These elements take place in the field of Psycho-informatics, defined as "an emerging discipline that uses tools and techniques from the computer and information sciences to improve the acquisition, organization, synthesis of human psychological data" (Yarkoni, 2012). More precisely, EMIs focus on a set of methods associated with clinical treatment in an ecological environment (D'Alfonso, 2020). Their mechanisms are based on large databases that can be collected passively by the phone's sensor (e.g., GPS) or actively by the completion of questionnaires by the user (Carter et al., 2007).

They can be used regarding different psychiatric and psychological problems such as anxiety, depression, OCD, and PTSD (Van Ameringen et al., 2017; Linardon et al., 2019; Schueller et al., 2017) as a tool of intervention. The term "EMIs" was first mentioned by Patrick et al. (2005) in a study on communication mechanisms for patients suffering from cancer. The goal was originally to deliver personalized interventions to patients. Therefore, EMIs take place in a complex construction defined by the relationship between the users and the intervention (Carter et al., 2007).

2.2 EMIs' Reference Model

As an ecological intervention, EMIs are based on Bronfenbrenner's classic ecological framework (1979). This theory highlights the impact of the environment on human behavior. Bronfenbrenner offered a list of determining factors contributing to the modeling of behavior. The main factors are identified as follows: the direct social environment, known as the microsystem (e.g., relationships, roles); the mesosystem, containing the indirect effect of the social environment on human development (e.g., peer group activities); the exosystem linked to the external social environment (e.g., organizational culture); and lastly, the macrosystems, underlying the effect of consistent elements between each of the systems (i.e., micro-, meso-, and exo-systems), such as the socioeconomic status. All those components interact to influence the behavior of the subject. This complexity explains the difficulties in developing targeted behaviors without taking into account the immediate environment and its effect on behaviors. EMIs allow personal advice to respond to those needs by including the environment in their digital counseling

2.3 Forms of EMIs

EMIs can be used in therapeutic follow-up or in everyday life because of their adaptability. This explains their extensive growth in the market field, with EMIs becoming more numerous, with many forms and applications. Their rapid development is also explained by the curiosity surrounding the system (Van Ameringen et al., 2017; Myin et al., 2018). They can offer different interventions, from simple clinical recommendations (e.g., relaxation exercises in stressful periods) to more formal and structured interventions (e.g., motivational messages during a craving phase for smoking cessation). They can also be used as a complement to therapeutic interventions or alone (Carter et al., 2007). EMIs usually allow different levels of complexity, depending on their features. The three main levels range from simple intervention to interactive and then integrative levels with a learning system over time (Schueller et al., 2017). At this stage, EMIs make use of machine learning, allowing recommendations to become more and more precise for the user as time goes by. This process follows the construction of interactive models as well as the construction of cognitive patterns. Therefore, their functioning becomes closer to that of Just-in-Time Adaptive Interventions (JITAI), a system offering custom interventions at the right time and for a unique user (Nahum-Shani et al., 2018).

2.4 Devices for EMIs

EMIs can be used from a computer or a smartphone. Indeed, computers offer several systems allowing EMIs to function, such as a personal digital assistant (PDA), a small electronic device running applications on a digital screen. However, smartphones seem advisable for EMIs use because of their ability to send and receive written and vocal messages, pictures, and videos. Their small size presents an asset for mobility and ease of use in an individual's daily life (Heron & Smyth, 2010). Some studies have shown good acceptance from participants for EMIs transmitted by those devices (Newman et al., 1999; King et al., 2008). Volunteers find it easy to remind themselves to use the device (Newman et al., 1999; King et al., 2008). However, as with other applications, EMIs can depend on the user's familiarity with the

interface (Rodgers et al., 2005).

2.5 Measurements of the Effects of EMIs

Due to the different interventions offered by EMIs, previous studies have had to adapt their measurement tools to the subject of the intervention. Indeed, no official measurements are recommended to evaluate the impact of EMIs. As an ecological intervention, such tools have to adapt to specific situations. For example, the Depression Anxiety and Stress Scale (DASS-21; Lovibond et al., 1995), the Perceived Stress Scale (PSS; Cohen et al., 1983), and the 20-item Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) were used to measure the impact of EMI on distress and affective disorders (Nguyen-Feng et al., 2019). We can also mention the 20-item State-Trait Anxiety Inventory-Trait Version to measure trait anxiety (Spielberger et al., 1983) and the 14-item Hamilton Anxiety Rating Scale to rate the severity of each overarching anxiety symptom cluster (Hamilton, 1959). The Penn State Worry Questionnaire, a 16-item self-report measure of the frequency and intensity of worry, was also used to measure the impact of EMI on anxiety (Newman et al., 2014; Meyer et al., 1990). Finally, as a tool for measuring perceived stress, the Psychological Stress Measurement 9 (PSM-9) is a questionnaire derived from the PSM 25 and the PSM 49, all created by Lemyre and Tessier (1988). The PSM-9 allows the quick measurement of three dimensions: behavioral strategies, cognitive-affective strategies, and somatic reactions. Each part refers to certain items of the questionnaire. Measuring scores of item 8 allows measurement of behavioral strategies, adding up scores of items 1, 2, 4, 5, 7, and 9 refers to measurement of cognitive-affective strategies, and scoring items 3 and 6 refers to measurement of somatic reactions (cf: Table 1).

2.6 Stress Model

Based on Siegrist's stress model (1986), Lemyre, Tessier, and Fillon (1990) proposed a biopsychosocial stress model relating to three main factors: cognitive-affective, behaviors, and somatic. This model associates individual processes, referring to coping strategies and perception, with environmental parameters (e.g., events and life context), leading to an integrative overview of factual parameters and psychological phenomena (cf: Figure 1). The authors offer a new position in stress definition, between a state of mental tension (Lemyre and Tessier, 1988) and the expression of stress biomarkers (e.g., cortisol levels and stress-related psychological responses) (Lupien et al., 2002; Theorell, 2007). This model identifies three main dimensions of stress components: affective cognitive, somatic, and behavioral. Stress is perceived as a fluctuant but normal phenomenon related to periods and life events, and it can differ from extremely low levels to overwhelming high states. Stress is seen as energizing or debilitating depending on individuals and situations (Lemyre and Tessier, 2003). Moreover, psychological stress can be defined as a continual state of psychological tension related to individual experience (Lemyre, 1987). However, the authors differentiate the events causing stress from stressors as two separate phenomena. Stressors are related to chronic situations or life events, demonstrating the impact of the environment as a contributing factor or a provoking agent of the stress feeling (Orpana et al., 2004; Orpana et al., 2007). This definition brings the vision of stress as a core construct resulting from the adaptation of the subject to life demands and the prediction of health (Lemyre and Lalande-Markon, 2009).

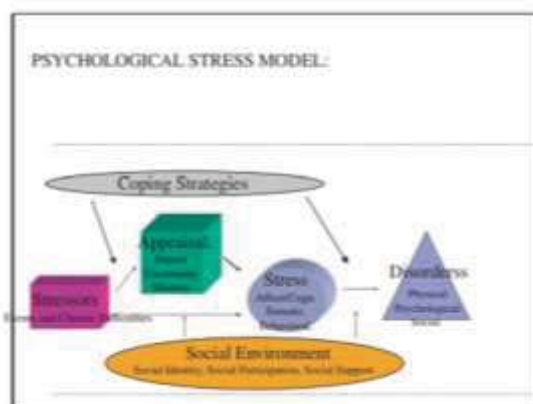


Figure 1. The psychological stress model (Lemyre and Lalande-Markon, 2009)

A long-term exposure to stress can then enhance stress disorders, leading to mental or physical illness. On a biological level, high stress intensity or long-term exposure to stress can be related to neuro-endo-immune mediators that weaken individuals' defense mechanisms. The stress model refers to a direct relation with health and is also perceived as a by-product of several factors, including healthcare, social, environmental, biological, and behavioral (Lemyre and Orpana, 2002). Its systemic approach allows the integration of stress as an integrative variable that takes part in the human ecology of health, as related to Bronfenbrenner's classic ecological framework (1979) (cf: Figure 2).

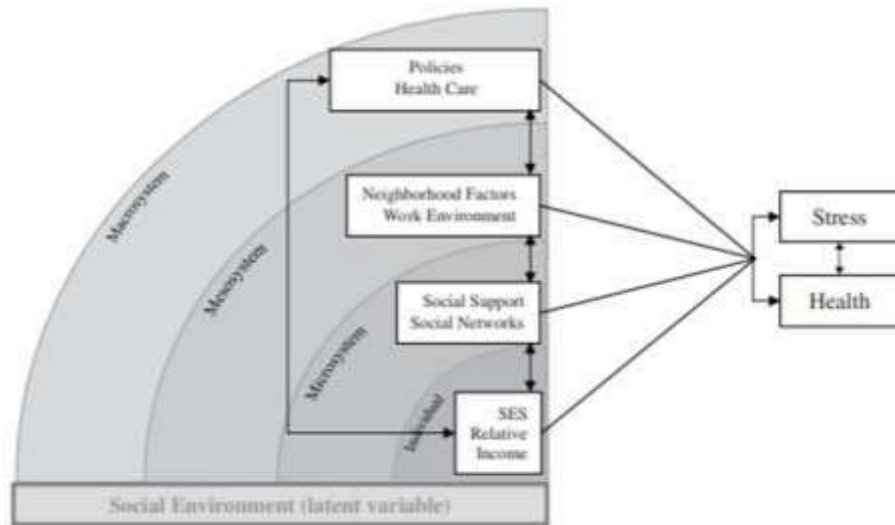


Figure 2. The ecological model of stress and health, adapted from S. Gibson, in Lemyre and Laland-Markon (2009)

The use of this model follows a consideration of social, biological, and psychosocial factors within a holistic approach to the individual in an environment. Health Psychology examines the influence of psychological factors on health or illness issues, such as social support, perceived stress, personality, and economic status (e.g., Taylor, 2008). This biopsychosocial model seems particularly relevant in a situation of diagnosis and intervention, serving as an initial assessment of an individual's health.

3. Aims and Hypotheses

Our objective was guided by the limitation of research regarding the use of EMIs (e.g., Donker et al., 2013; Torous et al., 2014) and the scarcity of studies exploring the inclusion of applications promoting health, performance, and well-being at work (van den Heuvel et al., 2009; Robroek et al., 2010; Wierenga et al., 2013). The aim of the present study was to examine the effects of EMI on the stress regulation strategies implemented by operators in a real work context. Three hypotheses were formulated:

- 1) Considering the three dimensions of perceived stress as proposed by Lemyre and Tessier (1988), stress should be measured through behavioral strategies. Thus, we hypothesized that EMIs would lead to changes in behavioral strategies, enabling individuals to better control perceived stress at work.
- 2) Another measure of perceived stress is the modification of cognitive and emotional strategies (Lemyre & Tessier, 1988), which can indicate the influence of EMIs on stress levels. As a second hypothesis, we supposed that EMIs would lead to the development of new cognitive and emotional strategies that regulate an individual's perceived stress at work.
- 3) Lastly, the somatization of perceived stress should also be observed (Lemyre & Tessier, 1988). Accordingly, we hypothesized that EMIs would be able to reduce somatization related to perceived stress in a work context.

4. Methods

4.1 Participants

Fifteen participants (14 women, 1 man) who volunteered to take part in this study were assigned to one of two conditions: the "no use of the EMI" condition and the "use of the EMI" condition. To recruit participants, we conducted online presentations of the study on social platforms and company networks. The study criteria were also provided: participants had to work at least three days a week, be fluent in French, be available for one full week, and have a personal smartphone to download the application. Initially, 30 volunteers were found, but only 15 completed the entire study. As the participants' level of technological proficiency might influence their use of the EMI (Stieger & Lewetz, 2018), they were asked if they were comfortable using smartphones during the initial contact. Those who faced difficulties were assigned to the control group, where they did not use the application. Two groups were formed: 10 participants in the "use of the EMI" condition (experimental group) and 5 participants in the "no use of the EMI" condition (control group). The participants included 9 employees, 5 managers, and 1 student employee, aged 21-60 ($M = 44$, $SD = 11.5$). The control group consisted of 4 women and 1 man, aged between 33 and 60 ($M = 44.3$, $SD = 11.6$). The experimental group consisted of 10 women aged between 21 and 60 ($M = 44$, $SD = 12.1$).

4.2 Material and Methods

4.2.1 EMI “Mon Sherpa” on the Phone

The application used in this study was "Mon Sherpa" developed by the company Qare. This application was awarded at the Psychiatry Congress "l'Encéphale" (2021) and downloaded more than 100,000 times in 2021. The application provides personalized follow-up and exercises tailored to individual needs, and it offers a space for patients to communicate and receive support between their appointments via a chatbot (Fig. 1).



Figure 3. “Mon Sherpa” (selected screens from the application)

4.2.2 Tasks

Participants were asked to complete a single activity per workday from a range of choices offered by the EMI over a one-week period. The choice of location and time of use was left to the participants, following the EMI protocol. The use of EMI needed to be coordinated with the users' needs (D'Alfonso, 2020), so they were allowed to choose the time of the intervention. The length of the experiment was designed according to ecological constraints. As the experiment took place in April, the planning was adjusted based on the participants' holiday schedules, resulting in a one-week duration. This short period aligned with the aim of our study, providing an initial assessment of the effects of the EMI at work.

To facilitate the use of the application and the understanding of the research protocol, two documents were provided to the participants. The first document summarized the aim of the study and the process to be followed during the week, while the second document presented a user's guide for "Mon Sherpa," providing step-by-step assistance in navigating the application.

4.2.3 Questionnaires and Interviews

Participants were asked to answer two questionnaires: one before, only on the first day, and the second questionnaire on three occasions - once before (day 1) and twice after performing the task (i.e., using "Mon Sherpa"), on day 3 and day 5 of the study. These questionnaires were administered online via a link sent to each participant.

The questionnaire filled in before the task contained 5 questions: four demographic items (age, gender, professional status, occupation), and the number of days worked per week.

The second questionnaire, administered three times, was the PSM-9 (Psychological Stress Measure), used to measure perceived stress at different times during the study (Lemyre & Tessier, 2003). This questionnaire was chosen as a quick evaluation of perceived stress, which can be completed during a working day, allowing participants to spend less time on what can be perceived as a long and repetitive task over the week.

The French version used contained 9 items rated on 8-point Likert-like scales, scored from 1 to 8 (Table 1): two somatic items (items 3 and 6), six cognitive-affective items (items 1, 2, 4, 5, 7, and 9), and one behavioral item (item 8). This PSM shows the same psychometric qualities of validity (.95), internal consistency (between .35 and .85), and reliability (.89) as the PSM-49 and the PSM-25, long and intermediate forms of the questionnaire (Lemyre & Tessier, 2003).

Table 1. PSM-9 questionnaire

Mark the number that best indicates the degree to which each statement applies to you recently, that is in the last 4-5 Days

Extremely	Not at all	Not really	Very little	A bit	Somewhat	Quite a bit	Very Much
1	2	3	4	5	6	7	8
1. I feel calm.....	1	2	3	4	5	6	7 8
2. I feel rushed; I do not seem to have enough time.....	1	2	3	4	5	6	7 8
3. I suffer from physical aches and pains: sore back, headaches, tensed neck, stomach aches.....	1	2	3	4	5	6	7 8
4. I feel preoccupied, tormented or worried.....	1	2	3	4	5	6	7 8
5. I feel confused; my thoughts are muddled; I lack concentration and I cannot focus my attention.....	1	2	3	4	5	6	7 8
6. I feel full of energy and keen.....	1	2	3	4	5	6	7 8
7. I feel a great weight on my shoulders.....	1	2	3	4	5	6	7 8
8. I have difficulty controlling my reactions, emotions, moods or gestures.....	1	2	3	4	5	6	7 8
9. I feel stressed.....	1	2	3	4	5	6	7 8

© Lemyre and Tessier, 1988, 2003

Semi-structured interviews were conducted with 9 volunteer participants from the experimental group to gather feedback on the use of the application (Table 2). The interview guide consisted of six sections: utility, usability, regulation, satisfaction, opinion of the experiment, and other feedback. These themes were chosen to incorporate the impact of technology into the process of stress regulation, aiming to understand the reasons for using the system (utility), the interaction between the user and the interface (usability), and the subjective aspect of user experience (satisfaction) (Brangier & Barcenilla, 2003). Regulation was also investigated to explore the behavioral changes that occurred during the period of app usage (Mercier & Lefer Sauvage, 2017). Despite integrating ergonomic dimensions, the study aimed to understand the participants' motivation during the experiment, as it could have influenced the results (Shahzadi et al., 2014).

Table 2. Guide for the semi-structured interview

Themes	Questions
	Could you present yourself? (Name, age, occupation, experiences, years of experience)
Utility	- Was the application useful to you? Why? - How does she help you or not to manage your stress? - Did it help you in other fields of your daily life?
Usability	- How do you find the application's first handling? Why? - Had you needed some time to get used to it? How much? - In which situation had you used the application? At work? At your home? Anywhere else? - For which reasons had you choose those situations? - Do you think this application would be usable in every situation?
Regulations used	- Had you learned some new techniques to compose with your stress? Which ones? - Do you think of reusing them later? - For which occasion those techniques may be useful to you? - Have you felt a difference in your daily behaviors at work during this week? And in your everyday life?
Satisfaction	- What have you felt about the application? - Do you think about using it in the future? Why? - Are there some elements you would like to upgrade inside the application? If yes which ones? - Are there some elements that please you inside? If yes which ones?

Opinions about the experiment	- What is your feeling about the experiment ? - How does it look to you, in terms of difficulty ? - Could you give me some positive and negative points ? - What do you think about the lengths ? - And for the lengths of each exercise ? - What about the questionnaire ? And the form of the application ?
Other feedbacks	- Have you other feedback to me ? Some points that haven't been explained ?

5. Results

For the analysis of PSM-9 scores, we ran a test of normality (i.e., Shapiro Wilk test). The data were analyzed using a Student's t test when the Shapiro Wilk test indicated a non-significant difference ($p > 0.05$). A repeated measures ANOVA was also used to compare the evolution of the PSM-9 scores obtained over the different days of the study. An inter-item comparison was also performed to observe the evolution of each of the three themes covered in the PSM-9 questionnaire.

Verbal data, extracted from the interviews, were subjected to thematic content analysis.

5.1 The Effects of EMIs on Behavioral States and Strategies for Regulating Perceived Stress at Work

5.1.1 Control Group vs. Experimental Group

According to the analyses of the PSM-9 results, there is no significant difference between the control group ($M = 3.25$; $SD = 1.17$) and the experimental group ($M = 3.55$; $SD = 2.02$) for item 8 "I have difficulty controlling my reactions, emotions, moods or gestures": $t(4) = 0.250, p = .407$ on day 1 (Table 3). No significant difference is then observed on days 3 and 5.

Table 3. Student's test on Days 1,3 and 5 from PSM-9 results

	Independent Samples T-Test (D1)			Independent Samples T-Test (D3)			Independent Samples T-Test (D5)			
	Statistic	df	p	Statistic	df	p	Statistic	df	p	
Item 1	Student's t	1.957	13.0	0.036	-0.376	13.0	0.643	0.6774	13.0	0.255
Item 2	Student's t	-0.608	13.0	0.723	2.047	13.0	0.031	1.1918	13.0	0.127
Item 3	Student's t	1.242	13.0	0.118	0.248	13.0	0.404	1.6695	13.0	0.059
Item 4	Student's t	0.343	13.0	0.369	-1.089	13.0	0.852	0.6001	13.0	0.279
Item 5	Student's t	1.336	13.0	0.102	0.898	13.0	0.193	1.4491	13.0	0.086
Item 6	Student's t	1.152	13.0	0.135	-0.488	13.0	0.683	0.3616	13.0	0.362
Item 7	Student's t	0.321	13.0	0.377	-0.419	13.0	0.659	0.3430	13.0	0.369
Item 8	Student's t	0.259	13.0	0.400	-1.210	13.0	0.876	-1.0574	13.0	0.845
Item 9	Student's t	0.494	13.0	0.315	-0.924	13.0	0.814	0.0820	13.0	0.468

5.1.2 Evolution of Behavioral Strategies

Analysis of PSM-9 scores suggests that EMI does not significantly influence the deployed behavioral strategies: $\chi^2(2) = 2.09, p = .352$ (Table 4). Participants who used the application for five days did not perceive any changes in their current daily behaviors.

Table 4. Detailed analyses of scores from the PSM-9

Detailed analyses of scores from the PSM-9														
Behavioral strategies			Cognitive and emotional strategies						Somatizations					
Friedman			Within Subjects Effects						Within Subjects Effects					
χ^2	df	p	Sum of Squares	df	Mean Square	F	p	Sum of Squares	df	Mean Square	F	p		
2.09	2	0.352	Cognition	64.8	2	32.4	2.57	0.102	Somatization	0.0606	2	0.0303	0.00489	0.995
			Residual	252.5	20	12.6			Residual	123.9394	20	6.1970		

On the contrary, analysis of the interviews suggests that participants developed new behavioral strategies to regulate perceived stress, anxiety or intrusive thoughts. These are mostly expressed in the search for action support through the application. Indeed, all the participants interviewed declared that they use the application to reinforce and increase their motivation to act « *At least we have a tool with activities that are proposed, that's useful because the activities even if you can do it without an application, doing it alone at home, it's less obvious. So, to have a little help, something that guides us, that's what it is in fact, it's to have a guide* » (Participant 2).

Nevertheless, the participants specified that this use must be occasional in response to particular needs « *On days when I'm really feeling overwhelmed, maybe the day I need to get away and even on weekends if I have a worry, I can use it* » (Participant 8).

Moreover, these behavioral strategies are related to the design of the application that encourages its use (e.g., functions): « *Sometimes during the day we get a message: Sherpa ask you if you slept well, or that kind of thing, so it reminds you ah yes I have to go see* » (Participant 1).

These strategies appear to be constrained by the environmental and temporal constraints often associated with the characteristics of the workspace, with employees reporting fear of being bothered by "interruptions", "noise" or the discomfort of performing exercises in front of colleagues « *So at work it's more difficult because we don't really have a place to isolate ourselves so we're on a open space if I stop and start breathing in a strange way they'll wonder* » (Participant 7). The lack of time at work was also mentioned by seven participants, with most preferring to use the application outside of work hours. Nevertheless, one person mentioned new regulation behaviors at work through the implementation of breaks used in particular for the application of "Mon Sherpa" « *When I'm at work I have a hard time taking breaks, and I don't really think about it, and the fact that the phone is ringing and I have a notification and I see the little guy can give me a break so it's good* » (Participant 5).

5.2 The Effects of EMIs on Cognitive-Affective Strategies for Regulating Perceived Stress at Work

5.2.1 Control Group vs. Experimental Group

There is a significant difference between the control group ($M = 2.75$; $SD = 0.5$) and the experimental group ($M = 4.73$; $SD = 1.95$) for item 1 "I am relaxed" on day 1: $t(13) = 1.957$, $p = 0.036$ (Table 3). This suggests that participants in the experimental group reported feeling more relaxed compared to the control group on the first day of the study.

Furthermore, the results indicate that item 2 "I feel overwhelmed, I feel like I'm running out of time" yielded significantly higher scores for the experimental group ($M = 4.82$; $SD = 1.4$) compared to the control group ($M = 3.25$; $SD = 0.957$) on day 3: $t(13) = -2.047$, $p = .031$. This indicates that participants in the experimental group reported feeling more overwhelmed and time-constrained compared to the control group on the third day of the study.

No significant differences were observed between the control and experimental groups on day 5.

Regarding the evolution of cognitive-affective strategies, the PSM-9 scores suggest that EMI did not lead to the adoption of new cognitive schemas or changes in affective state: $F(2,20) = 2.57$, $p = .102$ (Table 4). This indicates that participants did not perceive major differences in their cognitive patterns and affective states as they used the EMI.

In the interviews, eight participants mentioned the desire to talk to "Mon Sherpa" to seek emotional support "without judgments." The virtual companion was perceived as a friendly entity conducive to interactions without social norms, especially those expected in the context of work. As one participant expressed, "*It's a relief if you talk to someone who won't judge you*" (Participant 8). However, these conversations were still perceived as limited, as another participant mentioned, "*After that, it's still a computer interface*" (Participant 5). The comfort derived from the application was more related to the caring nature of the words and the design of the mascot. As one participant noted, "*I think that it was created to be kind and to listen, and this is felt in the design of the mascot*" (Participant 4).

The application allowed users to externalize their emotions and develop a sense of distance from intrusive thoughts that contributed to the deterioration of their affective state. One participant mentioned, "*To feel better, we must also take the time to know ourselves and simply stop the activities of the day to do so*" (Participant 2). The management of cognitive affects was addressed by almost all participants, with the exercises providing a sense of "appeasement." However, this sense of relief was perceived as temporary, as another participant mentioned, "*But it is just in the immediate after, we resume the rhythm. If I had been in a tense situation, I would have gone back to the tense situation, but it would have allowed me to stop at the moment!*" (Participant 2).

5.3 The Effects of IMEs on Somatization Associated With Perceived Work-Related Stress

5.3.1 Control Group vs. Experimental Group

No significant difference was observed between the two groups for days 1, 3 and 5.

5.3.2 Evolution of Somatizations

The scores obtained from the PSM-9 indicate that EMI has no significant effect on somatic regulation: $F(2,20) = 0.005$, $p = .995$ (Table 4). This suggests that the application does not significantly influence the construction and expression of employees' somatic responses over the course of a week.

However, the comments made by the employees provided a nuanced perspective and added context to the statistical analyses. Out of the nine participants, seven mentioned experiencing somatic regulation as a result of practicing the exercises offered by "Mon Sherpa." These effects were observed in various aspects, including improvements in sleep quality. One participant stated, *"I sleep better; I manage to sleep. I wake up less. Yes, I find that I wake up less. I manage to sleep for 6 hours in a row whereas before I used to wake up at 2 a.m. and fall asleep at 5 a.m. But now, I fall asleep at 11 p.m. and wake up at 6 a.m. or 7 a.m."* (Participant 1). Additionally, the exercises were reported to contribute to a reduction in agitation.

6. Discussion

Regarding our first hypothesis, which suggests that EMIs lead to changes in behavioral strategies for controlling perceived stress at work, the statistical analysis did not show a significant impact of the EMI on behavioral strategies. However, the thematic analysis of the semi-structured interviews revealed effective modifications in behavioral strategies reported by the participants. They mentioned improvements in motivation to act and better regulation of working hours. This discrepancy between the statistical results and the thematic analysis partially validates the hypothesis. This finding is consistent with previous studies, such as Waters et al. (2014).

Moving to our second hypothesis, which proposes that EMIs lead to the development of new cognitive and emotional strategies for regulating perceived stress at work, it was also only partially validated due to differences between the statistical results (as described in Section 4.2.2) and the semi-structured interviews. The EMIs, particularly the breathing and meditation exercises offered by "Mon Sherpa," were reported to contribute to a sense of well-being by addressing anxiety, stress levels, and the management of intrusive thoughts, as mentioned by participants during the interviews. However, the simplified interactions with the app in a care context could lead to a potential risk of social disconnection, as individuals may rely on the application for support instead of facing conflicts in their work environment (Sigerson et al., 2017). The effects, however, were not strong enough to produce a significant impact on work-related stress levels measured by the PSM-9.

Moving to our third hypothesis, which suggests that EMIs can reduce the somatization of perceived stress in the work context, it was also only partially validated due to contradictory results between the two methods. The interviews suggested an effect of EMIs on improving sleep quality, which confirms previous studies demonstrating the effectiveness of EMIs on sleep through the adoption of various behavioral strategies, such as getting up immediately after waking up (Rayward et al., 2020). However, these effects were not confirmed by the PSM-9, especially in the statistical analysis of the impact of EMIs on somatization (as described in Section 4.3.2).

Overall, our study suggests an immediate but not long-lasting effect of EMIs on work-related stress. According to the results, the use of EMIs may lead to a temporary change in individuals' behavior or cognition. However, they are more likely to return to their initial state of stress and anxiety after completing the guidance provided by the EMI, as indicated by one participant's statement. The partially validated hypotheses and the limitations in the sample size prevent us from making reliable conclusions based solely on the quantitative results. It is important to note that while EMIs can provide social support, especially when it is lacking from one's social circle, they cannot solve the underlying sources of work-related stress. Secondary prevention should not replace primary prevention and should be seen as a complement.

However, due to the small sample size, these results cannot be generalized and may differ in other samples depending on the organizational context of employees' industries. As mentioned earlier, results can vary depending on the type of work environment (e.g., open space, individual workspace) and the availability of workers throughout the day. Furthermore, the short duration of the experiment did not allow for the analysis of medium- or long-term effects. Participants did not have enough time to develop new habits, which could have influenced their use of the application and the resulting outcomes. Additionally, this study focused only on a few measures of perceived stress, while other manifestations may be involved. These limitations pose threats to the internal and external reliability and validity of the experiment. Since no other measuring tools were used to accommodate participants' daily availability, a comprehensive understanding of the effects of EMIs could not be achieved. Internal reliability might also be compromised by the chosen methodology, as participants self-recorded their responses using an online questionnaire. The possibility of social desirability bias could also influence the study's findings.

Further investigations are recommended with more comprehensive measurements, longer timeframes, and larger sample sizes. It would also be beneficial to examine variations in the impacts of EMIs across different work organizations.

7. Conclusion

This paper aimed to investigate the effects of EMIs on behavioral, cognitive-affective, and somatic strategies for perceived work-related stress. Perceived stress scores, measured by the PSM-9, were compared with participants' verbalizations. Although no significant results were found indicating the effects of EMIs, the semi-structured interviews revealed very short-term behavioral, cognitive-affective, and somatic changes immediately after engaging in the exercises proposed by 'Mon Sherpa'. This exploratory study has three main limitations: a small sample size, a short duration of the experiment, and a focus on perceived stress. Therefore, it would be interesting to include measures related to observable manifestations of perceived stress and involve a larger number of participants from various professional contexts in a long-term study.

Author Contributions: Emilie Perreau contributed to the conceptualization, methodology, formal analysis, writing—original draft preparation and writing—review and editing. Sarah Belouahchi participated in the validation and writing—review and editing. Davy Castel participated in the validation and writing—review and editing. Emilie Loup-Escande contributed to the supervision, writing—original draft preparation and writing—review and editing. All authors read and approved the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and its subsequent amendments. Before the experiment, the participants signed a web-based consent form. The participants did not receive any financial compensation for their participation, and they agreed to participate in the study. The anonymity, confidentiality, and secure storage of the data were guaranteed to the participants and respected. Ethical review and approval were waived for this study due to the use of a standardized and scientifically validated questionnaire and an interview that does not involve personal data.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Acknowledgments: The authors want to thank the participants for their key contributions.

Conflicts of Interest: The authors declare no conflict of interest.

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Emotions Interact With Empowering Leadership to Reduce Counterproductive Work Behavior

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Received: June 27, 2023 Accepted: August 5, 2023 Online Published: November 15, 2023

doi:10.5539/res.v15n4p14

URL: <https://doi.org/10.5539/res.v15n4p14>

Abstract

Getting a grasp of the psycho-affective processes and social anomie leading to counterproductive work behavior (Fox & Spector, 2006) represents a major challenge for researchers and organizations. The Cameroonian context is characterized by widespread impoverishment, which incites some officials to divert the objectives of the prescribed work to their personal interest, with no regard to the damage caused to either the organization or its members (Nyock Ilouga et al., 2018). This study examines the mediating role of emotions in the relationship between empowering leadership and counterproductive work behavior. 156 civil servants of both sexes were selected to complete a questionnaire which includes both the *Empowering Leadership Questionnaire* (Arnold et al., 2000) and the *Job Affective-relative Work questionnaire* (Van Katwyk et al., 2000). Our results suggest that the emotions felt by employees mediate the effect of perceived empowering leadership on the counterproductive behavior that employees manifest at work.

Keywords: empowering leadership, resentment, emotion, helplessness, entropy

1. Introduction

Counterproductive work behaviors constitute a complex and dynamic phenomenon. The study of such behaviors requires the consideration of various factors: emergence factors, vulnerability factors and moderating factors (Jauvin & al., 1999). In the recent decades, the prevention of deviant behaviors and the promotion of well-being have become the major concerns of public and private companies (Bernaud & al., 2016). These concerns become alarming in Cameroon where workers evolve in a context characterized by the collapse of the value placed on work, boredom, dissipation, vacuity, apathy and disloyal behaviors (Nyock Ilouga & al., 2018). An investigation by the Cameroonian Ministry of Finance reveals that the country lost nearly 6,000 billion CFA francs between 2012 and 2017 as a result of embezzlement of public funds, desertion at work and unreported deaths (Biaga, 2019). In a bid to identify the causes and eventually find solutions to this phenomenon, researchers pay particular attention to the organizational disinvestment caused by long breaks, repeated absences, presenteeism (El Akremi, 2006), theft, aggression or sabotage (Le Roy, 2010) or any other form of disloyal practice aimed at harming a client, a colleague or the organization itself (Buss, 1961). The psychodynamic perspective suggests that, these various types of behavior often reflect a sort of revenge displayed by employees in response to a perceived frustration or injustice (Dejours, 2001). This situation is usually the root of interpersonal conflicts at work (Aquino & al., 1999; Bies & TRipp, 1996; Kim & al., 1998; Le Roy, 2010).

The interest in the psycho-affective mechanisms that precede counterproductive work behavior stems from an attempt to overcome the obvious limitations of behaviorism, which overlooks the interiority of individuals. However, as El Akremi (2006) points out, the first reaction to frustration is emotional and attitudinal. It is therefore appropriate to admit that the external stimuli for this behavior are transmitted by psychological mechanisms. In the same vein, this study examines the mediating role of emotions, expressed as resentment, in the relationship between perceived empowering leadership and counterproductive work behaviors. Resentment refers to a memory of injustice (or frustration) experienced repeatedly, causing negative emotions, which-combined with a feeling of powerlessness, drives the victim into taking revenge (Fleury, 2020). The Cameroonian work environment is dominated by an erratic mode of operation enforced by line managers. Workers must comply with operating rules from hierarchical structures that are rigid and poorly adapted to operational objectives and constraints (Tamekou, 2008). This increases formalism and submission to the detriment of autonomy and creativity. Such a situation is the antithesis of so-called empowering managerial practices and can be a source of frustration for employees.

As a matter of fact, the steps taken by the Cameroonian authorities are barely able to considerably reduce

counterproductive work behavior. Most of these legal and administrative measures - derived from the *situational prevention model* in criminology (Clarke, 1980) - focus on prevention, control and repression. It is accepted from a behaviorist point of view that negative reinforcement contributes to the gradual reduction of unwanted behaviors (Skinner, 1938). However, the persistence of counterproductive behaviors in the Cameroonian context leads to a closer look at some of the deepest psychological processes within the employees. These processes involve emotions and resentment, motivate the willingness to violate organizational norms and harm stakeholders.

Based on the analysis of leadership practices in some Francophone African countries, Shu (2013) suggested that non-formal socio-cultural criteria such as: dowry, solidarity and the strong involvement of traditional power are considered when designing and implementing management practices in African organizations. This reality hinders the ambitions of many employees in need of autonomy and a large degree of decision-making latitude in the practice of their professions. This frustration also affects many workers who, due to these managerial difficulties associated with the lack of resources, are bored at work.

2. Frustration and Negative Emotions at Work

Based on current knowledge in the field, we know that the increase in counterproductive work behaviors is a structural and systemic problem, rooted in social, economic, organizational and cultural factors (Chappell & Di Martino, 2000; Mayhew & Quinlan, 1999). Several individuals, organizational and social factors are associated to it. Some are not work related (personality, family tensions) while others are directly related to work (incomprehension of tasks, impoverishment of workers, boredom and vacuity, perceived leadership). The emergence of counterproductive work behaviors may result from a combination of multiple and interrelated factors. According to the explanatory models formulated, emotions play an important role. We can regard emotion as a mental state that triggers one to react in an impulsive and irresponsible manner. As such, emotion remains an intrinsic component of our action insofar as it is integrated in our beliefs and desires. Emotion is a particular state of a being mobilized under well-defined conditions (a so-called emotional state) accompanied by a subjective experience and somatic and visceral manifestations (Doron & Parot, 2004). Whether pleasant or unpleasant, emotions have the common characteristic of not being purely cerebral but rather being accompanied by somatic and physiological modifications. Some theories consider the cognition of emotional sequence as the perception and evaluation of the significance of an event for a person's well-being (Christophe, 1998). These cognitive approaches also assume that the nature of emotion is determined by a cognitive evaluation ("appraisal"). In this process, the criteria of usefulness or harmfulness to the organism of a transaction with the environment occupy a central position. Emotion is a temporal process that includes various psychological mechanisms through which an event or a situation will become an emotional stimulus and give rise to an evaluation. In other words, counterproductive work behaviors result from the negative evaluation of an event that is emotionally perceived as harmful to the person's well-being. The frustrating event gives rise to emotions such as rage, anger, revenge and betrayal although reactions can vary over time and are intimately related to the subjective meaning given by the individual to the event (Fineman, 2008).

In the view of Berkowitz (1998), strong emotions can lead to impulsive reactions. In this light, a model developed by Fox and Spector (1999) clearly links frustration to the increase in counterproductive work behaviors. These authors consider frustration as the main trigger for revenge. Which role do stable emotional tendencies play in the expression of the response to a frustrating event?

Founded on the frustration-aggression model (Dollard et al., 1939), Berkowitz (1989) highlights the role of negative emotions in the relationship between frustration and aggression. From this author's view, aggressive behavior is a function of the individual's evaluation of a situation and the intensity of negative emotions. Emotion is an adaptive response to environmental stimuli (Plutchik, 1989) that gives way to the formulation of intentions to either engage or not in certain behaviors (Bies & al., 1997).

Following the *Stressor-Emotion Model* (Spector & Fox, 2005), negative emotions do not only result from an unforeseen blockage in the quest for a goal; but they also emerge in response to any stressful organizational situation. As such, according to the *Stressor-Emotion Model*, when an employee experiences a frustrating or stressful situation at work, he or she develops negative emotions and feelings and eventually adopts anti-social behaviors. Empirical studies indicate that high work demands, organizational injustice, conflicting relationships with supervisors and interpersonal injustice are important sources of frustration that lead to negative emotions in the employee, such as depression, sadness and anger (Bruk-Lee & Spector, 2006; Fox & Spector, 1999; Fox & al., 2001; Miles & al., 2002; Spector & Fox, 2002, 2005). Similarly, a study by Fox et al. (2001) points out that negative emotions are linked to certain stressful variables in organizational settings such as conflict ($r = .45$), organizational constraints ($r = .47$), distributive justice ($r = .38$), and procedural justice ($r = .44$).

The frustration-aggression dynamic model (Dollard et al., 1939) emphasizes that counterproductive work behaviors are generally used to reduce the tension created by the frustration. In this perspective, the individual will only resort to

revenge if he or she does not have the right and legitimate means to repair a frustration (or injustice) incurred. The feeling of powerlessness then appears as an indispensable mediator in the relationship between frustration and revenge. As a matter of fact, Bies (2001) points out that negative emotions felt repeatedly form hostile scripts. As such, once the stressful and frustrating situation is felt, negative emotions settle in the individual, then primary and secondary evaluations follows according to the cognitive (arousal of hostile thoughts, memory and affective scripts); the affective (recurrence of hostile and angry feelings) and the conative aspects (transfer of arousal, willingness to engage in hostile behavior). From the elaborated hostile schemas, the interpretation of ambiguous events feed the feeling of powerlessness resulting to resentment (Fleury, 2020).

3. Understanding the Dynamics of Resentment

Resentment is defined as a memory of injustice that arouses negative emotions accompanied by a desire for revenge. It is fostered by repeated instances of injustice experienced by man in his environment (Fleury, 2020). Resentment in individuals always results from an injury, violence endured, frustration or trauma to which the victim cannot react directly, due to powerlessness. He therefore ponders his revenge, which he cannot carry out and which torments him incessantly to the point of “explosion”.

Schematically, an employee experiences frustration or injustice as a result of a belief in a right that he or she is denied (Greenberg, 1996). This situation can expose the employee to the ordeal of resentment if he or she lacks the possibility of obtaining redress. As Fleury (2020) points out, the mechanism of resentment is based on “mental rumination”, which is a characteristic of bitterness related to the uncomfortable situation experienced and maintained on a daily basis in the psyche with the desire to take revenge. This revenge is not only aimed at repairing the harm incurred, but also to get rid of the negative emotions associated with it.

According to Leventhal (1979), Lang (1985) and Bower (1980), the schematic process of emotions starts from the different components (circumstances, perceptual conditions, expressive, psychological, subjective, behavioral responses) of each particular emotional experience which are represented together in the episodic memory. The recurrence of these emotional experiences with similar elements then leads to the formation of a prototype (generalized pattern) of this class of emotion. Whether manifest or dormant, if this class of emotion is associated to feelings of powerlessness, the individual will be exposed to resentment. Once resentment sets in, the undefined address of the response broadens the target of revenge. This situation helps to deal with a reality that could not be tolerated because it is deemed unfair, unequal, humiliating, unworthy of the merit that one attributes to oneself (Scheller, 1970).

4. The Empowering Leadership in an Entropic Context

In their analysis, Pinder and Harlos (2001) note that maintaining a culture of perceived unfairness and frustration in a company (with strong control, ambiguous rules and weak evaluations) often makes employees silent, so that they choose to not express their views. Yet, leadership needs are constantly evolving to accommodate the fact that workers are the main resources for organizations. (Davenport, 2010). Adopting an approach that helps to maximize organizational performance and human capital well-being has become an imperative that forces many organizations and managers to review their leadership practices. Considered as a process of power sharing by line managers, empowering leadership enhances the autonomy, potential, meaning and impact of employees and work teams (Kirkman & Rosen, 1999). Empowerment is a process of enhancing feelings of self-efficiency among organizational members by identifying and eliminating disempowering conditions, increasing resources-and expanding room for maneuver and empowering people through formal and informal organizational practices of sharing useful information (Conger & Kanungo, 1988). Empowering leadership generally gives rise to prosocial behaviors since it requires formal leaders to encourage subordinates to express their opinions, promote collaborative decision making and support information sharing and teamwork (Arnold & al., 2000; Chen & al., 2011; Pearce & al., 2003). However, Cameroonian workplaces go through a leadership crisis which seems to have abandoned to the workers the responsibility to invent their functioning mode. This leadership crisis is rooted in the difficulty, already chronic, of moving from bureaucratic and authoritarian style to a management by objectives and control (Nyock Ilouga & Moussa Mouloungui, 2019). In reality, the networks of solidarity in charge of the organization of professional circles in Cameroon disable the control mechanisms, which are indispensable in management by objectives. Nevertheless, some of the empowering leadership behaviors identified by Arnold & al. (2000) seem to have taken root in this context. These are: 1) *management by example*, which reflects the leader's commitment not only to his work, but also to that of his team members ; 2) *coaching (autonomy)* which is a set of behavior aimed at empowering team members; 3) *participatory decision-making*, which comprises the inclusion of ideas and opinions of team members into the decision-making process; 4) *consideration (interaction with collaborators)* which is a set of behavior that promotes the well-being of team members; and 5) *information sharing* which is the dissemination of important information such as information concerning the mission and philosophy of the organization. These observations suggest the hypothesis that perceived empowering leadership reduces the expression of resentment in employees. This

reduction is amplified by the control of negative emotions.

Theoretical research model and data analysis strategy

Baron and Kenny (1986) clarified the roles of the variables involved in a triangular relationship in which one variable (the mediator variable) plays an intermediary role between two other variables (the independent variable and the dependent variable) all involved in an explanatory model. The figure of their mediation model is similar to the following figure:

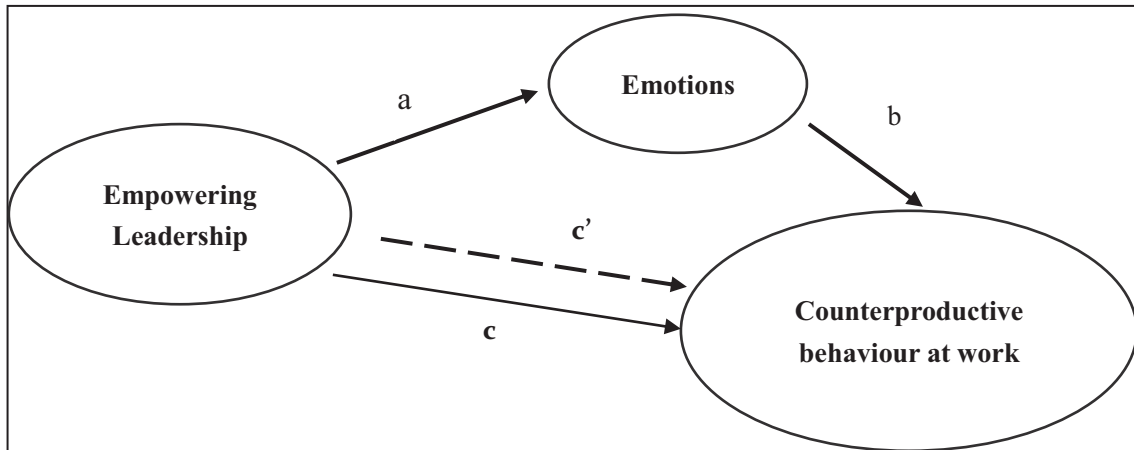


Figure 1. The conceptual framework of the research

This model has three variables, of which it is assumed that the interaction between two (empowerment leadership and emotions), rather than the underlying components, causes the third (counterproductive work behavior). This structure involves a system of three linear regression equations that enables the materialization of the direct impact of the independent variable (X) on the mediator (M) and on the dependent variable (Y), but also the residual effects of the independent variable (X) and the mediator variable (M) on the dependent variable (Y) when (M) and (X) are introduced simultaneously in the same linear least squares regression equation.

$$Y = \beta_{1.0} + cX + e_1 (E_1)$$

$$M = \beta_{2.0} + aX + e_2 (E_2)$$

$$Y = \beta_{3.0} + c'X + bM + e_3 (E_3)$$

If E_1 ; E_2 ; E_3 represent the three linear least squares equations, $\beta_{1.0}$; $\beta_{2.0}$; $\beta_{3.0}$ denote the intercept of each of the three equations; with c' the total effect of X on Y ; the direct effect of X on M ; c' the residual effect of X on Y and b the residual effect of M on Y .

Yzerbyt et al. (2018) recently showed that: when all three conditions are met, mediation is effective if and only if the total effect (c) of the independent variable X on the dependent variable Y (E_1) is greater in absolute value than the residual effect (c') of the independent variable X on the dependent variable Y (E_3). In other words, assuming that all three equations are correctly estimated, the mediation model has an underlying equality that can be formulated through the following fundamental equation: $c = c' + a \times b$. It appears that the difference between the direct effect (c) and the residual effect (c') of X on Y is equal to the product of the direct effect (a) of X on M and the residual effect (b) of M on Y .

In this conception, rather than focusing on the direct benefits of empowering leadership and the role of emotions, Baron and Kenny (1986) mainly focus on the effect of their interaction. There is therefore a high risk of inflation in multicollinearity when the effects of the independent variable and the mediator on the dependent variable are jointly estimated (E_3). As a result, the independent variable could have a smaller coefficient when it predicts the dependent variable (c) on its own and a larger coefficient when it acts simultaneously in the same equation with the mediator (c'), but the larger coefficient will not be significant while the smaller coefficient would be. In the case where the value of c' is reduced to zero, we have strong evidence of a single dominant mediating variable, whereas, if this same residual effect of X on Y is non-zero, then several mediating factors are involved. In order to reduce the risk of multicollinearity inflation and to ensure the significance of the mediator effect, the use of the factorial approach suggested by Yzerbyt et al. (2018) is recommended. This approach proceeds to the demonstration that the two coefficients that form the product between the direct effect of X on M (a) and the residual effect of M on Y (b) are simultaneously significant.

Hypothesis

Emotions are structured and adaptive responses to stimuli perceived by humans. These lead to an evaluative process that includes organizational justice issues which induce subsequent behavior. This is because, in a given organizational context, different categories of emotions do not specifically appear in isolation. However, McCraty et al. (1995) admit that, under certain conditions, one category of emotions may dominate the others. Thus, Beaud and Pialoux (1999) have noted that even in the most authoritarian organizations, hostile to any form of emergence of divergent subjectivity, laughter, humor, joy, anger, hostility or affection are always involved. It is known that the interpretation of relationship issues as well as the choice of adaptive response is a matter of personal emotional experience (Salovey & Mayer, 1990). Viaux and Bernaud (2001) observed that the indicators of resentment, particularly negative emotions, emanate from the disruption of the ethical bond that occurs among the people involved in maladaptive work behavior. Workers actually build bonds with the organizations that employ them. These bonds usually spring from the manner in which workers get recruited into the organization, the way they represent it, as well as the value they place on their work, their personal duties, and those of the organization. Organizations have their own bonding culture, which is particularly manifested in hierarchical relationships. Resentment arises from the fact that the employee's professional conscience may lead him to defend principles that are in opposition to those widely shared by colleagues and advocated by the organization's hierarchy. Such opposition can lead to derogatory mishaps, followed by the generation of ambivalent emotions. In this view we postulate that the emotional state of the employee mediates the relationship between perceived empowering leadership and counterproductive work behavior (H_1).

5. Methodology

5.1 Participants

This study was carried out using a snowball sample of 156 civil servants from the central administration of Cameroon (78 men and 78 women), serving in different government ministries in Yaoundé. In order to better describe the nature of the sample, the socio-demographic data of the 156 participants are presented in Table 1. It appears that the sample is made up of teachers undergoing professional retraining (33.3%); engineers (23.7%); works inspectors (14.7%); senior technicians (11.5%); health personnel (15.4%) and civil administrators (1.3%). The average age is 36.1 years and the average professional experience is 7.73 years. Here is a characteristic of the population dominated by youths under 40, where the youngest is 20 years old and the oldest is 59. This age distribution reflects the population of the country, and perhaps of the African continent, which is made up of a large cohort of youths with a low life expectancy and which presents major challenges in terms of employability, health, nutrition etc. (Nyock Ilouga & al., 2018).

Table 1. Sample description

		Frequency	Percentage	Cumulative percentage
SEX	Men	78	50.0	50.0
	Women	78	50.0	100.0
AGE M= 36.10 years	20-29	38	24.4	24.4
	30-39	71	45.5	69.9
	40-49	31	19.9	89.7
	50-59	16	10.3	100.0
EXPERIENCE M= 7.73 years	6months- 5 years	72	46.2	46.2
	6- 10 years	32	20.5	66.7
	11- 15 years	33	21.2	87.8
	16years+	19	12.2	100.0
PROFESSIONAL CATEGORIES	Teachers	52	33.3	33.3
	Health personnel	24	15.4	48.7
	Engineers	37	23.7	72.4
	Inspectors (postal, work, treasury)	23	14.7	87.2
	Senior technicians	18	11.5	98.7
	Civil administrators	2	1.3	100.0

5.2 Material

This research took place during the month of January 2022. Participants were asked to complete a paper-and-pencil questionnaire structured in four main parts. The first part deals with personal information (age, gender, occupation, work experience). The second part deals with empowering Leadership which was assessed by *Empowering Leadership Questionnaire (ELQ)* developed by Arnold et al. (2000). This scale provides 38 items distributed into five dimensions. Example: "To what extent does your supervisor impulse high performance through his/her behavior?". Respondents were asked to give their opinion on a five-point Likert-type scale ranging from 1. (Never) to 5. (Always). Items 1-5 measure *management by example* ($\alpha = .89$); 6-11 measure *participatory decision-making* ($\alpha = .86$); 12-22 measure *autonomy* ($\alpha = .94$); 23-28 measure *information sharing* ($\alpha = .89$); 29-38 measure *interaction with collaborators* ($\alpha = .93$). The overall value of Cronbach's α (0.97) confirms a good internal consistency of this scale. In the third part, the evaluation of emotions was based on the scale of Van Katwyk et al. (2000). The *Job Affective-relative Work Scale (JAWS)* provides 20 items (Ex: My job irritates me) and measures 10 negative emotions ($\alpha = .90$) and 10 positive emotions ($\alpha = .88$) encountered at work. Respondents were asked to express their opinions on a five-point Likert scale ranging from 1. (never) to 5. (very often). The fourth section measuring counter-productive work behavior comprises the *Counter-productive Work Behavior Check list (CWB-C)* by Spector et al., (2006). This instrument is an integrated version of previous tools (Fox & Spector, 1999; Hollinger, 1986; Neuman & Baron, 1998; Robinson & Bennett, 1995; Spector, 1975). Since this study focuses on the occurrence of counterproductive work behavior, we opted for the actor-aggressor perspective and respondents were asked to rate the observation frequency of counterproductive work behavior using a five-point Likert scale ranging from 1. (never) to 5. (every day). Example: "Verbally abusing a colleague or client".

5.3 Process of Data Analysis

Internal consistency tests (Cronbach's alpha) were used to assess the internal consistency between the items of the tools used. Descriptive analyses (means and standard deviations) were also used to summarize the information collected on each variable. To test our different hypothesis, the linear least squares technique was used to solve linear regression equations (Baron & Kenny, 1986).

6. Results

6.1 Descriptive Analysis

Table 2. The matrix of correlations between variables of the research. Notes; ME (management by example); PDT (participation in decision making); AUTO (autonomy); INF-S (information-sharing); INT (interaction); NE (negative emotions); PE (positive emotions); CWB O (counterproductive work behavior towards the organization); CWB I (counterproductive work behavior towards individuals); M= Mean; SD= Standard deviation), **($p < .01$).

Variables	M	SD	1	2	3	4	5	6	7	8	9
ME	3.79	1.00	1								
PDT	3.29	1.00	,659**	1							
AUTO	3.35	1.08	,622**	,802**	1						
INF-S	3.30	1.08	,504**	,665**	,821**	1					
INT	3.18	1.06	,510**	,729**	,806**	,668**	1				
NE	2.49	0.88	-,338**	-,498**	-,531**	-,558**	-,462*	1			
PE	3.54	0.80	,331**	,323**	,378**	,406**	,333**	-,547*	1		
CWB O		1.05	-,366**	-,455**	-,487**	-,509**	-,393*	,551**	-,434**	1	
	2.47										
CWB P	1.73	0.96	-,317**	-,409**	-,464**	-,474**	-,359*	,566**	-,357**	,671**	1

***. The correlation is significant at the 0.01 (two-tailed).*

The descriptive statistics on the variables show that the average level of positive emotions expressed by Cameroonian civil servants ($M_{PE} = 3,54$; $SD = 0.8$) is relatively higher than the level of negative emotions ($M_{NE} = 2,29$; $SD = 0.88$). The standard deviation values are low. This reflects a high concentration of respondents' opinions among the average values obtained in the evaluation of the various variables of the study. It appears that work experience has a rather positive dominant tone for Cameroonian civil servants. Regarding empowering leadership, the mean scores obtained are very close for all considered dimensions and slightly above the theoretical mean of the 5-point Likert scale. The standard deviation values are equally very low. However, it should be noted that management by exception has the highest scores of all empowering ~~ment~~ leadership dimensions. This observation is particularly interesting in a context known to be in leadership crisis, where workers are forced to think about their work and adjust their ability to cooperate without

managerial intervention (Nyock Ilouga & Moussa Mouloungui, 2019). The mean score of counterproductive behavior towards individuals ($M_{CWBI} = 1.73$; $SD = 0.96$) remains relatively lower than the mean score of counterproductive behavior towards the organization ($M_{CWBO} = 2.47$; $SD = 1.05$). This therefore shows that the context of the Cameroonian public service is strongly dominated by counterproductive behavior towards the organization such as theft and misappropriation of state property as mentioned in the National Anti-Corruption Commission report published in 2020.

The analysis of the correlation matrix reveals that, the different dimensions of empowering leadership (IV) are significantly and positively related to each other. On the other hand, a very significant relationship exists between these dimensions of the IV and the counterproductive work behaviors (DV). All correlations between the dimensions of empowering leadership and counterproductive work behaviors are negative. This trend can be illustrated through the relationships observed between information sharing and the counterproductive behavior towards the organization ($r = -0.409$) and towards individuals ($r = -0.474$). It would appear that information sharing is related to a reduction in the probability of occurrence of counterproductive work behavior. While all the relationships found between the dimensions of empowering leadership and negative emotions are negative, those found between the same dimensions of empowering leadership and positive emotions are all positive. The values of the correlation coefficient between autonomy and negative emotions ($r = -.478$); autonomy and positive emotions ($r = .378$) are particularly illustrative in this finding. It can therefore be concluded that empowering leadership is related to a reduction in negative emotions and an increase in the expression of positive emotions. Positive emotions are negatively related to counterproductive behavior towards the organization ($r = -0.434$) and towards individuals ($r = -0.357$), while negative emotions are positively related ($r = 0.55$) towards the organization ($r = 0.56$) and towards individuals. These observations fully support the idea that counterproductive work behaviors mostly result from the integration of emotional considerations in the choice of adaptive response that involves cognitive processing of aversive situations.

6.2 Hypothesis Tests

The results of the hypothesis test from the linear regression analysis indicate that all dimensions of perceived empowering leadership have a statistically significant effect on employees' emotions. Multiple regression analysis was carried out on SPSS to estimate the direct effects of empowering leader behaviors on counterproductive behavior. These results equally reveal the respective contributions of each empowering leader behaviors in the explanation of the variance of the scores obtained during the evaluation of counterproductive behavior.

Overall, it appears that empowering leadership is a predictor of counterproductive behavior towards the organization ($R_{aj}^2 = 0,222$; $F = 9,861$; $p = 0,000$) and the effect of information sharing remains significant ($\beta = -,254$; $t = -2,289$; $p = 0,023$). However, the effects of other dimensions are insignificant, i.e., management by example ($\beta = -,021$; $p = 0,819$), interaction with the supervisor ($\beta = 0,068$; $p = 0,551$), autonomy ($\beta = -0,173$; $p = 0,275$) and participation in decision making ($\beta = 0,102$; $p = 0,420$). Concerning counterproductive behavior towards individuals, the analyses carried out show that empowering leadership practices represent an explanatory factor with a significant effect ($R_{aj}^2 = 0,321$; $F = 12,115$; $p = 0,000$).

Among the empowering leader, only the effect of information sharing remains significant ($\beta = -,325$; $t = -2,763$; $p = 0,006$). The effects of other dimensions are insignificant. Namely, management by example ($\beta = -,071$; $p = 0,476$), interaction with the supervisor ($\beta = 0,42$; $p = 0,725$), autonomy ($\beta = -,079$; $p = 0,637$) and participation in decision making ($\beta = -0,164$; $p = 0,222$). The result of this analysis indicates that empowering leadership contributes to a significant reduction in counterproductive work behaviors. Similarly, the effect of empowering leader behaviors on employees' emotions turned out to be significant. Empowering leadership specifically helps increase positive emotions ($R_{aj}^2 = 0,321$; $F = 6,985$; $p = 0,000$) in employees. The effect of the information sharing dimension is significant ($\beta = ,217$; $t = 2,286$; $p = 0,02$). The effects of management by example ($\beta = -0,79$; $p = 0,688$) as well as other dimensions remained insignificant. No significant direct effects were observed with participative decision making ($\beta = -0,037$; $p = 0,734$); interaction with the supervisor ($\beta = 0,061$; $p = 0,528$) information sharing ($\beta = -0,217$; $p = 0,024$) and autonomy ($\beta = 0,001$; $p = 0,993$).

On the other hand, it appears that empowering leadership contributes to a significant decrease in negative emotions in employees ($R_{aj}^2 = 0,162$; $F = 12,115$; $p = 0,000$) where information sharing is the only dimension having a significant effect ($\beta = 0,217$; $p = 0,06$). While management by example ($\beta = 0,071$; $p = 0,476$); participative decision making ($\beta = -0,164$; $p = 0,222$); interaction with the supervisor ($\beta = -0,042$; $p = 0,725$) and autonomy ($\beta = 0,079$; $p = 0,637$) have no significant effect. These results reveal that potential effects produced by the different dimensions of empowering leadership crisis may favour the multiplication of counterproductive behaviors towards individuals. However, not all the potential effects observed here are statistically significant. Moreover, the analysis carried out revealed that emotions felt by employees explain their adoption of counterproductive work behaviors towards organizations ($R_{aj}^2 = 0,320$; $F = 37,45$; $p = 0,000$), while the negative emotions expressed tend to favor their

multiplication ($\beta = 0,539; t = 5,655; p = 0,000$), the positive emotions felt rather contribute to their reduction ($\beta = -0,250; t = -2,390; p = 0,018$). This result indicates a need for leaders to multiply actions that generate positive emotions while avoiding those that may cause negative emotions in employees. This would significantly reduce aggressive behaviors towards their organizations. Furthermore, our analyses revealed that employees' emotions account for their engagement in aggressive acts towards individuals ($R^2_{aj} = 0,315; F = 36,575; p = 0,000$). In fact, it appears that the expression of negative emotions significantly increases CWBI ($\beta = 0,585; t = 6,654; p = 0,000$) while positive emotions slightly contribute to their reduction ($\beta = -0,085; p = 0,392$). This result is in line with our hypothesis.

6.3 The Mediation Analysis

Correlation analyses showed that all dimensions of empowering leadership are related to emotions (positive and negative) and counterproductive work behavior towards individuals and the organization. It also appears that emotions, both positive and negative, are related to all the modalities of counterproductive work behaviors. Regression analyses were conducted to clarify the mediating role of emotions in the relationship between empowering leadership and the occurrence of counterproductive work behavior. The guidelines of Baron and Kenny (1986) were followed to test for compliance with the basic statistical postulates of a mediation effect. The analyses conducted in the following lines therefore examine the mediating role of emotions (M) in the relationship between empowering leadership (X) and counterproductive work behavior (Y). Nevertheless, a causal path analysis was used using the structural equation modelling technique (Alger & De Boeck, 2017).

According to Baron and Kenny (1986), perfect mediation is observed if the independent variable no longer has an effect on the dependent variable when the mediating variable is controlled. Conversely, if the relationship between the independent and dependent variable decreases but remains significant when the mediating variable is jointly considered with the independent variable, then a partial mediator effect can be concluded. However, Yzerbyt and al. (2018) have shown that : when the three conditions are met, mediation is effective if and only if the total effect (c) of the independent variable X on the dependent variable Y [$Y = \beta_{1,0} + cX + e_1 (E_1)$] is greater in absolute value than the residual effect (c') of the independent variable X on the dependent variable Y [$Y = \beta_{3,0} + c'X + bM + e_3 (E_3)$]. In other words, assuming that all three equations are correctly estimated, the mediation model has an underlying equality that can be formulated through the following fundamental equation: $c = c' + a \times b$. It appears that the difference between the direct effect (c) and the residual effect (c') of X on Y is equal to the product of the direct effect (a) of X on M and the residual effect of M on Y.

6.4 The Mediating Role of Negative Emotion

6.4.1 Mediating Effect of Negative Emotions in the Relationship between Empowering Leadership and Counterproductive Work Behaviors Towards the Organization

The data in Table 3 below show that all dimensions of empowering leadership significantly inhibit the expression of negative emotions and the occurrence of counterproductive behavior towards the organization. Information sharing is the leadership dimension with the highest inhibitory control over negative emotions ($\beta = -.56; p < .01; R^2_{aj} = .31$) and counterproductive work behaviors towards the organization ($\beta = -.51; p < .01; R^2_{aj} = .25$). Management by example is the leadership dimension with the lowest inhibitory control over negative emotions ($\beta = -.34; p < .01; R^2_{aj} = .11$) and counterproductive work behavior towards the organization ($\beta = -.36; p < .01; R^2_{aj} = .12$).

Table 3. Mediating effect of negative emotions in the relationship between empowering leadership and counterproductive anti-organizational behavior; M_1 refers to the model of the direct effects of empowering leadership dimensions on the expression of negative emotions and the occurrence of counterproductive work anti-organizational behavior; M_2 corresponds to the mediation model

		Negative Emotions (MV)		Counterproductive Work Behavior Towards the Organization (DV)			
		Direct Effect (M_1)		Direct Effect (M_1)		Residual effect (M_2)	
		R^2_{aj}	a	R^2_{aj}	c	R^2_{aj}	c'
Empowering Leadership (IV)	Information sharing	.31	-.56**	.25	-.51**	.37	-.18(ns)
	Management by example	.11	-.34**	.12	-.36		-.08 (ns)
	Interaction with supervisor	.21	-.46**	.15	-.40**		.06(ns)
	Autonomy	.28	-.53**	.23	-.49**		-.06(ns)
	Participation in decision-making	.24	-.50**	.20	-.45**		-.08(ns)

The results also reveal that negative emotions significantly increase the occurrence of counterproductive behavior towards the organization ($\beta = .55; p < .01; R^2_{aj} = .3$). The figure 2 below shows the regression coefficients linking the dimensions of empowering leader behavior to counterproductive behavior towards the organization when negative emotions are included in the regression equation.

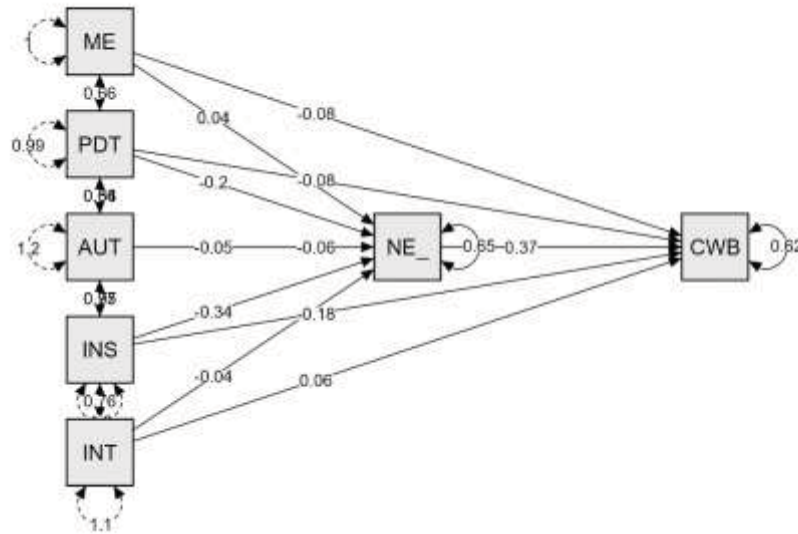


Figure 2. The mediating effect model of negative emotions in the relationship between empowering leadership and counterproductive behavior towards the organization. INT (interaction with supervisor); INS (information-sharing); AUT (autonomy); PDT (participation in decision-taking); ME (management by example); NE (negative emotion); CWB (counterproductive work behavior)

Apparently, the empowering leader behaviors and negative emotions are introduced simultaneously into the same regression equation, all the regression coefficients that evaluate the indirect effects of empowering leadership dimensions lose the ability to reduce the occurrence of counterproductive behavior towards the organization. The effect of interaction with the supervisor is reversed by the effect of negative emotions, thus promoting the occurrence of counterproductive behavior. In line with the hypothesis of Yzerbyt and al. (2018), these results show that negative emotions completely mediate the effects of empowering leadership on counterproductive behaviors towards the organization. The presence of negative emotions nullifies the effectiveness of empowering leadership in the reduction of counterproductive behavior at work. Some leadership practices, such as interaction with supervisors, even lead to an increase in maladaptive behaviors when negative emotions are involved.

6.4.2 Mediating Effect of Negative Emotions in the Relationship between Empowering Leadership and Counterproductive Work Behavior towards Individuals

The data in Table 4 below show that all dimensions of empowering leadership significantly inhibit the expression of negative emotions and the occurrence of counterproductive behavior towards individuals. Information sharing is the leadership dimension with the highest explanatory power for counterproductive behavior towards individuals ($\beta = -.47; p < .01; R^2_{aj} = .22$) whereas management by example is the dimension with the lowest explanatory power for counterproductive behavior towards individuals ($\beta = -.32; p < .01; R^2_{aj} = .09$).

Table 4. Mediating effect of negative emotions in the relationship between empowering leadership and counterproductive behavior towards individuals; M_1 refers to the model of the direct effects of empowering leadership dimensions on the expression of negative emotions and the occurrence of counterproductive anti-organizational behavior; M_2 corresponds to the mediation model.

	Negative Emotions (MV)		Counterproductive Work Behavior Towards individuals (DV)			
	Direct Effect (M_1)		Direct Effect (M_1)		Residual effect (M_2)	
	R^2_{aj}	a	R^2_{aj}	c	R^2_{aj}	c'

Empowering Leadership (IV)	Information sharing	.31	-.56**	.22	-.47**	.36	-.117(ns)
	Management by example	.11	-.34**	.094	-.32**		-.037(ns)
	Interaction with supervisor	.21	-.46**	.123	-.36**		.087(ns)
	Autonomy	.28	-.53**	.21	-.46**		-.16(ns)
	Participation in decision-making	.24	-.50**	.162	-.41**		-.02(ns)

These results also reveal that negative emotions significantly increase the occurrence of counterproductive behaviors towards individuals ($\beta = .56; p < .001; R^2_{aj} = .31$). The diagram in Figure 3 below shows the regression coefficients linking the dimensions of empowering leadership to counterproductive behavior towards individuals when negative emotions are included in the regression equation.

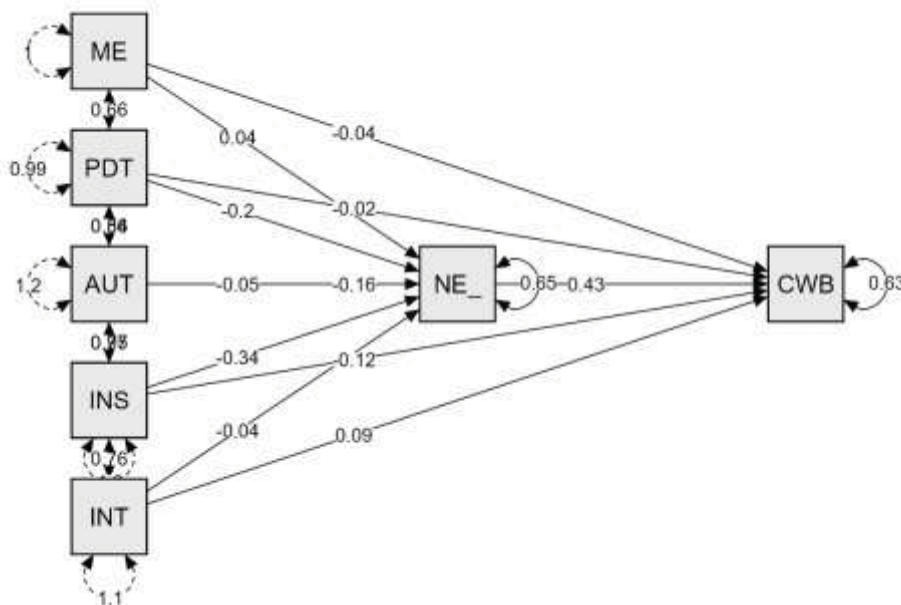


Figure 3. The mediating effect model of negative emotions in the relationship between empowering leadership and counterproductive behavior towards individuals. INT (interaction with supervisor); INS (information-sharing); AUT (autonomy); PDT (participation in decision-taking); ME (management by example); NE (negative emotion); CWB (counterproductive work behavior)

As empowering leadership dimensions and negative emotions are introduced simultaneously into the same regression equation, all the regression coefficients that evaluate the indirect effects of empowering leadership dimensions lose the ability to reduce the occurrence of counterproductive behaviors towards the organization. The effect of the interaction with the supervisor is once more reversed by negative emotions. In line with the hypothesis of Yzerbyt et al. (2018), these results show that negative emotions completely mediate the effects of empowering leadership on counterproductive behavior towards individuals.

6.5 The Mediating Role of Positive Emotions

6.5.1 Mediating Effect of Positive Emotions in the Relationship between Empowering Leadership and Counterproductive Behavior Towards the Organization

The data in Table 5 below show that all empowering leadership dimensions significantly foster the expression of positive emotions and significantly inhibit the occurrence of counterproductive behaviors towards the organization. Further to this trend, information sharing is the leadership dimension with the highest explanatory power of positive emotions ($\beta = .41; p < .01; R^2_{aj} = .16$). Participation in decision making is the leadership dimension with the lowest explanatory power of positive emotions ($\beta = .32; p < .01; R^2_{aj} = .10$).

Table 5. Mediating effect of positive emotions in the relationship between empowering leadership and counterproductive anti-organizational work behavior; M_1 refers to the model of the direct effects of empowering leadership dimensions on the expression of positive emotions; M_2 corresponds to the mediation model

		Positive Emotions (MV)		Counterproductive Work Behavior Towards the Organization (DV)			
		Direct Effect (M_1)		Direct Effect (M_1)		Residual effect (M_2)	
		R_{aj}^2	a	R_{aj}^2	c	R_{aj}^2	c'
Empowering Leadership (IV)	Information sharing	.16	.41**	.25	-.51**	.34	-.24*
	Management by example	.10	.33**	.12	-.36		-.023(ns)
	Interaction with supervisor	.10	.33**	.15	-.40**		.06(ns)
	Autonomy	.14	.38**	.23	-.49**		-.074(ns)
	Participation in decision-making	.10	.32**	.20	-.45**		-.17(ns)

These results also reveal that positive emotions significantly decrease the occurrence of counterproductive behaviors towards the organization ($\beta = .55; p < .001; R_{aj}^2 = .31$). The diagram in Figure 4 below shows that: as the dimensions of empowering leadership and positive emotions are simultaneously introduced into the same regression equation, the regression coefficients estimating the indirect effects of empowering leadership dimensions lose their capacity to reduce the occurrence of counterproductive behavior towards the organization, with the exception of information sharing, whose regression coefficient $\beta = -.24; p < .01$) remains significant, in the same direction and with a smaller magnitude than the coefficient for the direct effect $\beta = -.51; p < .01$). We note that information sharing maintains its power to inhibit counterproductive behavior towards the organization when the subsequent emotions are positive. On the other hand, the downward curve of counterproductive behaviors towards the organization seems to reverse when the interaction with the supervisor produces positive emotions ($\beta = .06$). This effect is statistically insignificant. This tendency, previously observed in the presence of negative emotions, suggests that the outbreak of emotions in hierarchical relationships favors the inflation of counterproductive behaviors towards the organization.

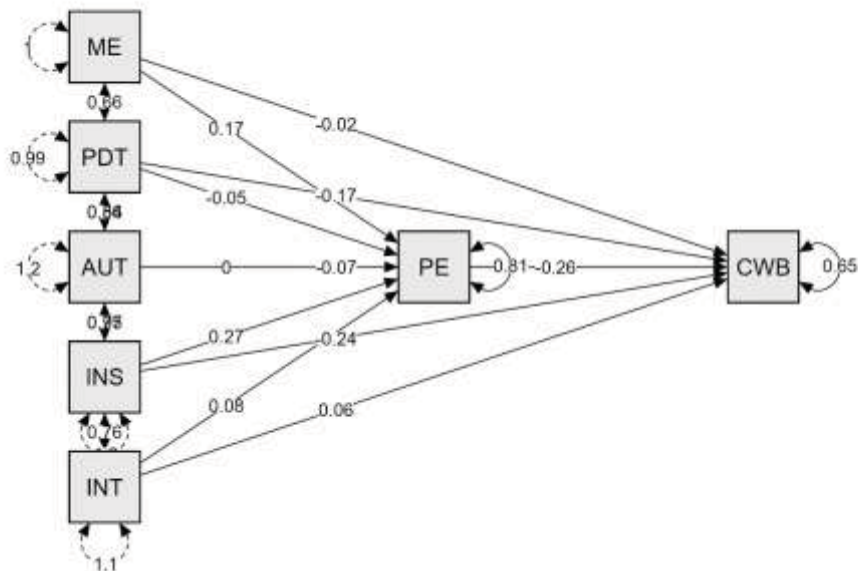


Figure 4. The mediating effect model of positive emotions in the relationship between empowering leadership and counterproductive behavior towards the organization. INT (interaction with supervisor); INS (information-sharing); AUT (autonomy); PDT (participation in decision-taking); ME (management by example); PE (positive emotion); CWB (counterproductive work behavior)

The effect of the interaction with the supervisor is once more reversed by positive emotions. In line with the hypothesis of Yzerbyt et al. (2018), these results show that positive emotions completely mediate the effects of empowering leadership on counterproductive behaviors towards the organization. This mediation is partial on information sharing.

6.5.2 Mediating Effect of Positive Emotions in the Relationship between Empowering Leadership and Counterproductive Work Behavior towards Individuals

The data in Table 6 below show that all empowering leadership dimensions significantly foster the expression of positive emotions and significantly reduce the occurrence of counterproductive behaviors towards the organization. This is evident in the effect of information sharing on the expression of positive emotions ($\beta = .41; p < .01$). The results also reveal that positive emotions significantly decrease the occurrence of counterproductive behaviors towards the individuals ($\beta = -.36; p < .01; R_{aj}^2 = .12$).

Table 6. Mediating effect of positive emotions in the relationship between empowering leadership and counterproductive work behavior towards individuals; M_1 refers to the model of the direct effects of empowering leadership dimensions on the expression of positive emotions; M_2 corresponds to the mediation model

		Positive Emotions (MV)		Counterproductive Work Behavior Towards individuals (DV)			
		Direct Effect (M_1)		Direct Effect (M_1)		Residual effect (M_2)	
		R_{aj}^2	a	R_{aj}^2	c	R_{aj}^2	c'
Empowering Leadership (IV)	Information sharing	.16	.41**	.22	-.47**	.27	-.21(ns)
	Management by example	.10	.33**	.094	-.32**		.01(ns)
	Interaction with supervisor	.10	.33**	.123	-.36**		.08(ns)
	Autonomy	.14	.38**	.21	-.46**		-.18(ns)
	Participation in decision-making	.1	.32**	.162	-.41**		-.11(ns)

The diagram in Figure 5 below shows that: when empowering leadership dimensions and positive emotions are simultaneously introduced into the same regression equation, the regression coefficients that estimate the residual effects of all the dimensions of empowering leadership lose their capacity to reduce the occurrence of counterproductive behaviors towards the organization. The effects of interaction with the supervisor and management by example are reversed under the effect of positive emotions. As a result, the downward curves of counterproductive behaviors towards individuals seem to invert when interaction with the supervisor ($\beta = .08$) and management by example $\beta = .01$) produce positive emotions. These residual effects are statistically insignificant. But this tendency, previously observed with information-sharing on counterproductive behavior towards the organization when negative emotions are involved, also affects management by example on counterproductive behavior towards individuals when positive emotions are involved.

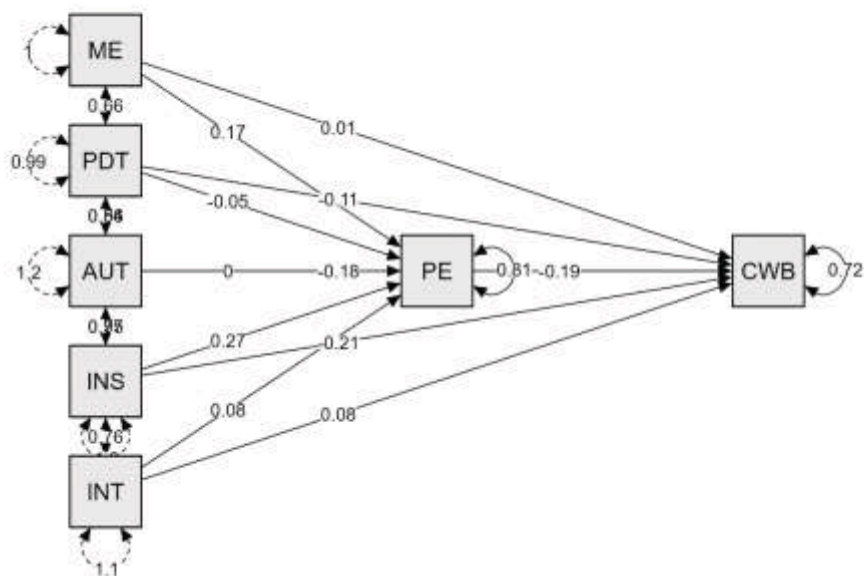


Figure 5. The mediating effect model of positive emotions in the relationship between empowering leadership and counterproductive behavior towards individuals. INT (interaction with supervisor); INS (information-sharing); AUT (autonomy); PDT (participation in decision-taking); ME (management by example); PE (positive emotion); CWB (counterproductive work behavior)

This tendency, previously observed when negative emotions are involved, suggests that the outbreak of emotions in hierarchical relationships favors the inflation of counterproductive behavior towards individuals. In line with the hypothesis of Yzerbyt et al. (2018), these results show that positive emotions completely mediate the effects of empowering leadership on counterproductive behaviors towards individuals.

7. Conclusion

In a nutshell, these results show that emotions only partially mediate the effect of information sharing on the occurrence of counterproductive behaviors towards the organization. It is also found that the inhibiting effects of management by example and interaction with the supervisor on counterproductive work behaviors are reversed when positive and negative emotions are involved. It appears that the display of emotions nullifies the beneficial effects of empowering leadership practices in addressing counterproductive work behaviors. Some leadership practices, such as interaction with supervisors, even lead to an increase in maladaptive behavior when emotions are involved. The interpretation of emotions in hierarchical situations is a problem faced by Cameroonian civil servants. It would seem the expression of emotions fosters maladaptive behavior at work. These results fully support the hypothesis of the catalytic role of ethical breakdown whose emotional drivers mediate the effects of empowering leadership on the occurrence of counterproductive work behaviors.

8. Discussion

From the analyses conducted, it appears that empowering leadership practices increase the opportunities for employees to express positive emotions while reducing the occurrence of negative emotions and counterproductive work behaviors. The emotions felt by employees mediate the effects of perceived empowering leadership on counterproductive work behavior. However, it should be noted that when empowering leadership practices are present, negative emotions maintain their power to drive counterproductive work behaviors. On the other hand, when they are associated with empowering leadership practices, positive emotions enhance their inhibiting power of counterproductive work behaviors. In some cases, the association of empowering leadership practices and positive emotions increases the probability of occurrence of counterproductive work behavior. These include management by example and interaction with the supervisor. Finally, one must keep in mind that the expression of emotions, both positive and negative, is useless in the struggle towards maladaptive work behaviors. As a result, the diversity and severity of transgressions may increase as line relationships become emotionally strenuous. Nevertheless, the result of this study highlights that in a context where line relationships carry more positive than negative emotions, employees engage in less counterproductive behaviors, even though works done by Rein et al. (1995) admit that negative affects tend to be retained longer in memory longer rather than positives affects. However, if positive emotional sequences occur in a

context dominated by negative emotions, there will be an increase in CWB towards the organization and individuals. This finding proves that adaptive skills arise from the evaluation of emotions in interaction contexts. The ability to identify emotions has been associated with social skills in adults (Denham & al., 2015). Previous studies have also found that emotional knowledge predicts peer acceptance and adaptive social behaviors (White & al., 2021). In contrast, difficulties with emotional recognition predict social problems (Nowicki et al., 2019), and internalizing symptoms (Dede et al., 2021). These observations go in line with the *Stressor Emotion Model* (Spector & Fox, 2005). The *Stressor-Emotion Model* establishes a linear causal relationship between lack of autonomy, negative emotions and counterproductive work behavior. This reflects the need to emphasize employees' autonomy and access to information in order to reduce their propensity for theft, embezzlement, corruption, etc., which are rife in the public service today. In his study model, Kelley (1992) points that in leadership practice, the best followers are committed subordinates who are able to courageously state their views. However, in order to achieve this, managers need to create a suitable environment that enables them to become "exemplary co-workers". This can only be possible if the manager sets an example and is a role model for the employees.

Bies and his collaborators have found that employees generally also expect managers to treat them with respect, honesty, courtesy and politeness, to care about their rights and well-being and to observe certain moral standards of interpersonal behaviors (Bies & Moag, 1986; Bies, 2001). In this case, the supervisor appears as a relational partner whose level of respect for the principles of interpersonal behavior constitutes a criterion for employees to judge his or her fairness (Bies, 2001) and loyalty (Tyler & Degoey, 1996). Moreover, Erhart and Klein (2001) observed in a study that employees would prefer to work with a relationship-oriented leader, as opposed to a charismatic or task-oriented leader.

Previous studies have shown that empowerment leadership leads to the development of positive effect and prosocial behaviors at work. This form of leadership is based on a process of power sharing by formal leaders that improves the autonomy, potential, purpose and impact of employees and work teams (Kirkman & Rosen, 1999). This study follows this trend by noting that the crisis of empowering leadership activates negative emotions in employees and leads them to adopt counterproductive work behaviors in response, which may be targeted either towards the organization that employs them, or towards individuals working there (authorities and colleagues) or those who attend for a service needed (customers).

This study encourages managers to emphasize employee empowerment in order to stimulate positive emotions, which is one of the key factors of commitment and prosocial work behaviors. More importantly, these leadership practices help to avoid tensions and resentments within the organization which can lead to revenge (Fleury, 2020) or counterproductive behaviors (Spector & Fox, 2005).

Similar to previous studies on the model, the emotions felt by the employee are addressed in this study as processes through which certain identified variables contribute to the development of counterproductive behaviors at work. However, Fida et al. (2014) noted the importance of moral disengagement in the process of an employee violating an organizational norm. Bandura (2016) defines moral disengagement as a set of ways in which individuals rationalize their wrong (unethical) actions. It is the propensity of an individual to use cognitions that allow them to restructure their unethical actions so that they appear less cruel, while mitigating the distress that would result from the harm, they cause to others. Future research could further explore this relationship by including this mediating variable in a bid to better explain anti-organizational behaviors.

Authors' contribution and conflict of interest.

1. Nyock Ilouga Samuel was in charge of the conceptual aspects, data analysis and discussion of the results;
2. Djigou Jacques was in charge of the drafting, literature review and data collection;
3. Moussa Mouloungui Aude Carine was in charge of the format, ethical considerations and references.

Declaration of Conflicts of Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. Funding: the author(s) received no financial support for the research, authorship, and/or publication of this article.

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Public Debt and Economic Growth after Covid-19 in Europe: Challenges and Policy Implications

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Received: July 13, 2023 Accepted: November 8, 2023 Online Published: November 29, 2023

doi:10.5539/res.v15n4p31

URL: <https://doi.org/10.5539/res.v15n4p31>

Abstract

The Covid-19 pandemic has had a profound impact on European economies, leading to a significant increase in public debt levels. This paper examines the challenges and policy implications of managing public debt and fostering economic growth in Europe post-Covid-19. It provides a conceptual framework by defining and measuring public debt, exploring the relationship between public debt and economic growth, and highlighting the role of public debt in times of crisis. The paper analyzes the impact of Covid-19 on public debt in Europe, including the fiscal response, debt accumulation, and reasons for increased debt levels. It further discusses the challenges posed by high public debt, such as debt sustainability, crowding out private investment, financial stability risks, and constraints on future fiscal policy.

The study then presents policy implications for balancing public debt and economic growth, including fiscal consolidation measures, long-term debt management strategies, prioritizing public investments, implementing structural reforms, considering monetary policy, and fostering international cooperation. Additionally, the paper provides case studies of selected European countries, evaluating their approaches, assessing policy effectiveness, and drawing key lessons and best practices. Finally, the paper concludes with a summary of key findings, policy recommendations for European governments, and suggestions for future research directions.

Keywords: Covid-19, public debt, economic growth

1. Introduction

The Covid-19 pandemic has had a significant and far-reaching impact on economies worldwide, including those in Europe. Governments across the region have implemented unprecedented measures to mitigate the health and economic consequences of the pandemic. These measures, such as lockdowns, business closures, and income support programs, have required substantial financial resources, leading to a significant increase in public debt levels. The surge in public debt raises important challenges and policy implications for European economies as they navigate the post-Covid-19 recovery phase. Balancing the need for economic growth and stability with the imperative of managing and reducing public debt becomes a critical task for policymakers. This paper aims to explore the challenges and policy implications associated with public debt and economic growth in Europe after Covid-19.

The structure of the paper follows a logical progression to address the objectives outlined in the introduction. The first section examines the impact of Covid-19 on public debt in Europe, discussing the fiscal responses to the pandemic, the increase in public debt levels, and concerns related to debt sustainability. The subsequent section explores the challenges to economic growth in the post-pandemic era. It analyzes the short-term economic contraction experienced during the pandemic and the potential long-term structural implications on growth. It also delves into the dynamics of the labor market and the hurdles faced in recovering employment levels.

Moving on, the paper discusses policy implications for public debt management. It explores various strategies that can be employed to effectively manage public debt, including fiscal consolidation, debt sustainability frameworks, revenue enhancement measures, and expenditure rationalization and efficiency. Next, the paper focuses on strategies for promoting economic growth amid high public debt. It examines the importance of investment in infrastructure and innovation, enhancing human capital, implementing structural reforms, and seeking international collaboration and support. To provide practical insights, the paper includes case studies from selected European countries such as Germany, Italy, Spain, and Sweden. These case studies offer real-world examples of the challenges faced by different nations and the strategies employed to manage public debt and foster economic growth post-Covid-19. Finally, the conclusion summarizes the key findings of the paper, presents policy recommendations based on the analysis, and identifies potential avenues for future research in the field.

2. Public and Economic Growth: A Conceptual Framework

2.1 Definition and Measurement of Public Debt

Public debt refers to the accumulated liabilities of a government resulting from its borrowings to finance budget deficits or fund public expenditures. It represents the total amount of money that a government owes to its creditors, both domestic and foreign. Public debt can take various forms, including government bonds, treasury bills, loans from domestic or international sources, and other forms of borrowing.

Measurement of public debt is typically expressed as a percentage of a country's Gross Domestic Product (GDP). This debt-to-GDP ratio provides an indication of the debt burden relative to the size of the economy. It allows for comparisons between countries with different levels of economic output and provides a measure of the sustainability of the debt. Public debt can be classified into two main categories: a) Internal Debt: This refers to the debt owed by the government to domestic creditors. It includes government bonds and treasury bills held by individuals, financial institutions, and other entities within the country. Internal debt is denominated in the domestic currency and is subject to the interest rates prevailing in the domestic market. b) External Debt: External debt represents the debt owed by the government to foreign creditors. It includes loans and bonds issued in foreign currencies, owed to international financial institutions, foreign governments, or private investors. External debt is subject to fluctuations in exchange rates and may carry different terms and conditions compared to domestic debt.

Public debt is typically monitored and measured by government entities responsible for financial management, such as the ministry of finance or the central bank. These institutions compile and analyze data on the outstanding debt, interest payments, and debt service obligations. International organizations, such as the International Monetary Fund (IMF) and the World Bank, also play a role in monitoring and providing data on public debt for various countries.

In addition to the debt-to-GDP ratio, other indicators are used to assess the sustainability and risk associated with public debt. These include debt service ratio (the proportion of government revenue allocated to debt payments), interest coverage ratio (the ability to meet interest obligations), and the maturity structure of the debt (short-term vs. long-term debt).

Accurate measurement and monitoring of public debt are crucial for policymakers to make informed decisions regarding debt management, fiscal policies, and ensuring the sustainability of public finances. Regular assessment and transparency in reporting public debt figures are essential for maintaining credibility in financial markets and promoting responsible fiscal practices.

2.2 Relationship between Debt and Economic Growth

The relationship between public debt and economic growth has been a subject of extensive debate among economists. Different theoretical perspectives provide insights into this relationship: a. Keynesian Perspective: According to Keynesian economics, during economic downturns or recessions, public debt can play a positive role in stimulating economic growth. Increased government spending financed by debt can boost aggregate demand, leading to increased economic activity and employment. This perspective suggests that public debt can have a short-term positive impact on economic growth. b) Neoclassical Perspective: Neoclassical economists argue that high levels of public debt can have adverse effects on economic growth. They emphasize the potential negative consequences of high debt levels, such as crowding out private investment and increasing borrowing costs. According to this view, high public debt can hinder long-term economic growth prospects. c) New Keynesian Perspective: The New Keynesian perspective incorporates elements of both Keynesian and neoclassical theories. It recognizes that public debt can have short-term stimulative effects on the economy, but emphasizes the importance of debt sustainability and proper fiscal management to avoid long-term negative consequences on economic growth.

The empirical evidence on the relationship between public debt and economic growth is mixed. The relationship is influenced by several factors, including the level of debt, the quality of public spending, institutional factors, and the broader economic context.

2.3 The Role of Public Debt in Times of Crisis

During times of crisis, such as economic downturns or emergencies like the Covid-19 pandemic, public debt assumes a crucial role in supporting the economy and mitigating the negative effects of the crisis. Here are some key ways in which public debt plays a role in times of crisis:

a) Countercyclical Fiscal Policy: Public debt allows governments to implement countercyclical fiscal policies to stabilize the economy during a crisis. By increasing government spending or reducing taxes, financed through borrowing, governments can boost aggregate demand and stimulate economic activity. This counteracts the contractionary forces and helps prevent a deeper and more prolonged economic downturn.

b) **Crisis Management and Social Safety Nets:** Public debt enables governments to provide financial support and implement social safety net programs during a crisis. This support can take the form of unemployment benefits, income support for affected individuals and households, subsidies for struggling businesses, and healthcare investments. By using debt to fund these programs, governments aim to mitigate the adverse impacts of the crisis on individuals and businesses, reducing the overall social and economic distress.

c) **Infrastructure and Investment:** Public debt can be used to finance critical infrastructure projects and investment initiatives during a crisis. These investments can serve multiple purposes, such as improving public health infrastructure, enhancing transportation networks, and supporting research and development activities. Such investments not only contribute to immediate job creation but also provide long-term benefits, fostering economic growth and resilience.

d) **Financing Emergency Expenditures:** Crises often necessitate emergency expenditures to address urgent needs, such as healthcare resources, disaster relief, or national security. Public debt allows governments to quickly mobilize funds to respond to these emergencies, ensuring that necessary resources and services are available to protect and support the population. e) **Economic Recovery and Stimulus Packages:** Public debt plays a vital role in financing economic recovery measures and stimulus packages. Governments may implement fiscal stimulus programs, including tax incentives, grants, subsidies, and public infrastructure projects, to revive economic activity and restore confidence. By leveraging debt, governments can provide the necessary financial resources to jump-start economic recovery and facilitate a return to sustainable growth.

While utilizing public debt during a crisis can be essential for managing the immediate challenges, it is crucial to ensure responsible and sustainable debt management. Governments must carefully assess the long-term implications of increased debt levels and develop strategies for debt repayment and fiscal consolidation once the crisis subsides. A balanced approach is necessary to ensure that the short-term benefits of public debt in times of crisis do not lead to long-term fiscal instability or hinder future economic growth.

3. Literature Review

The Covid-19 pandemic has had a profound impact on public debt levels in Europe. Governments implemented extensive fiscal measures to mitigate the health and economic consequences of the crisis, resulting in a significant increase in public debt. This literature review examines the research conducted on the impact of Covid-19 on public debt in Europe, focusing on key findings and insights.

Numerous studies have documented a substantial increase in public debt across European countries as a result of the pandemic. For instance, a study by Alesina et al. (2020) found that public debt-to-GDP ratios in several European countries could increase by 20 to 30 percentage points due to Covid-19-related fiscal responses. More precisely; Alesina et al. (2020) compared the impact of the 2008 global financial crisis with the Covid-19 pandemic on public debt. They analyze the fiscal responses implemented during both crises and assess their implications for public debt levels in Europe. The study examines the differences and similarities in the fiscal policy measures taken, the magnitude of the debt increase, and the potential long-term consequences. By comparing the two crises, the researchers highlight the unique features of the Covid-19 pandemic and the unprecedented fiscal responses adopted. They discuss the substantial increase in public debt as a result of expansive fiscal measures aimed at mitigating the economic effects of the pandemic. The study also examines the differences in policy responses between countries and emphasizes the importance of coordination and cooperation at the international level.

Similarly, Baldini and Bova (2020) observed a significant rise in public debt across European Union member states, with debt-to-GDP ratios expected to exceed pre-pandemic levels. More precisely, they examined the impact of the Covid-19 pandemic on public debt and fiscal sustainability in European Union (EU) countries. They analyze the factors contributing to the increase in public debt levels and evaluate the implications for fiscal sustainability in the post-pandemic period. The researchers examine the fiscal responses adopted by EU countries to address the economic challenges posed by the pandemic. They discuss the expansionary fiscal measures implemented, including increased government spending and reduced tax revenues, and their impact on public debt. The study also assesses the heterogeneity in debt dynamics across EU member states, considering factors such as initial fiscal conditions, economic structure, and policy responses.

Baldini and Bova (2020) highlight the importance of managing public debt in a way that ensures long-term fiscal sustainability. They discuss the need for credible medium-term fiscal frameworks to guide debt reduction efforts and maintain market confidence. The study also emphasizes the role of economic growth, structural reforms, and productivity-enhancing policies in supporting debt sustainability in the post-pandemic period. The increase in public debt has raised concerns about debt sustainability in the post-pandemic period. Researchers have emphasized the need for careful debt management strategies to ensure fiscal sustainability. For instance, Buti et al. (2021) emphasized the importance of developing credible medium-term fiscal frameworks to guide debt reduction efforts and maintain market

confidence. They also highlighted the role of economic growth in facilitating debt sustainability.

Several studies also have examined the relationship between public debt and economic growth in the context of the pandemic. Researchers have found that high levels of public debt can potentially hamper economic growth. However, the specific impact may depend on various factors, including the initial debt level, fiscal policy response, and country-specific characteristics. For example, Baldini and Bova (2020) suggested that while the increase in public debt could have negative implications for long-term growth, it could be offset by policies promoting productivity, investment, and structural reforms. Similarly, Kose et al. (2021) argued that the negative impact of public debt on growth could be mitigated through policies promoting fiscal credibility, debt sustainability, and structural reforms.

4. Impact of Covid-19 on Public Debt in Europe

4.1 Fiscal Responses to the Pandemic

The Covid-19 pandemic necessitated swift and extensive fiscal responses from European governments to mitigate the health and economic impacts. The fiscal measures implemented aimed to provide immediate support to individuals, businesses, and healthcare systems, while also laying the groundwork for economic recovery. The following are some key fiscal responses adopted by European countries:

- a) **Direct Financial Assistance:** Governments provided direct financial assistance to individuals and households affected by the pandemic. This assistance included income support programs, unemployment benefits, cash transfers, and one-time payments to mitigate the loss of income and ensure basic necessities.
- b) **Wage Subsidies and Job Retention Schemes:** To prevent widespread job losses, many European governments introduced wage subsidy programs and job retention schemes. These initiatives aimed to support businesses in retaining their employees by subsidizing a portion of their wages or providing grants to cover labor costs during the period of reduced economic activity.
- c) **Business Support Programs:** Governments implemented various support programs to assist businesses, particularly small and medium-sized enterprises (SMEs), which were severely impacted by the pandemic. These programs included grants, loans, tax relief measures, and liquidity support to ensure business continuity, maintain employment, and facilitate post-pandemic recovery.
- d) **Healthcare and Social Spending:** European governments substantially increased healthcare spending to strengthen healthcare systems and respond to the immediate needs arising from the pandemic. This involved investing in healthcare infrastructure, procuring medical equipment and supplies, expanding testing and vaccination capabilities, and supporting research and development efforts. Additionally, social spending was augmented to address the heightened demand for social services and protect vulnerable populations.
- e) **Sector-Specific Support:** Governments targeted specific sectors heavily affected by the pandemic, such as tourism, hospitality, aviation, and cultural industries. Measures included sector-specific grants, tax relief, and tailored support packages to help these industries survive the crisis and rebuild their activities as restrictions eased.
- f) **Temporary Tax Relief and Deferrals:** Governments implemented temporary tax relief measures and deferrals to ease the financial burden on individuals and businesses. These measures included tax payment deferrals, reduced tax rates, exemptions, and extensions for filing tax returns, providing much-needed cash flow and liquidity support during the crisis.
- g) **European Union Initiatives:** The European Union launched various initiatives to support member states in their fiscal responses to the pandemic. Notably, the Next Generation EU recovery fund was established, providing financial assistance through grants and loans to help countries revive their economies, undertake necessary investments, and implement reforms for sustainable growth.

The fiscal responses to the Covid-19 pandemic in Europe were diverse, reflecting the unique circumstances and policy priorities of each country. These measures aimed to provide immediate relief, support economic recovery, and ensure the well-being of individuals and businesses. However, the substantial fiscal interventions resulted in a significant increase in public debt levels, necessitating careful debt management strategies and long-term fiscal sustainability considerations.

4.2 Increase in Public Debt Levels

The Covid-19 pandemic has led to a significant increase in public debt levels across Europe as governments implemented expansive fiscal measures to address the health crisis and support their economies. The combination of increased spending and reduced revenue streams due to the economic downturn has resulted in a surge in public debt. Here are some key factors contributing to the rise in public debt levels:

- a) **Emergency Spending:** Governments allocated substantial funds to support healthcare systems, provide financial assistance to individuals and businesses, and stimulate economic activity during the pandemic. These emergency expenditures, including investments in healthcare infrastructure, procurement of medical supplies, and income support programs, have contributed to the increase in public debt.
- b) **Reduced Tax Revenues:** The economic downturn caused by the pandemic has led to a decline in tax revenues for governments. Business closures, reduced consumer spending, and lower corporate profits have resulted in decreased tax receipts. This reduction in revenue sources has further strained public finances and contributed to the rise in public debt.
- c) **Automatic Stabilizers:** Automatic stabilizers, such as unemployment benefits and income support programs, automatically expand during times of economic downturn to provide a safety net for individuals and support aggregate demand. While crucial for social stability, these automatic stabilizers increase government spending and, consequently, public debt.
- d) **Financial Support to Businesses:** Governments provided financial support to businesses through grants, loans, and guarantees to help them withstand the economic impact of the pandemic. This assistance, aimed at preventing business closures and preserving jobs, required additional borrowing, thereby contributing to the increase in public debt.
- e) **Economic Contractions and GDP Decline:** The pandemic-induced economic contractions across Europe have resulted in reduced GDP growth rates and, in some cases, negative GDP growth. The decline in economic output has a compounding effect on public debt ratios, as debt-to-GDP ratios increase when GDP contracts or grows at a slower pace.
- f) **European Union Initiatives:** The launch of European Union initiatives, such as the Next Generation EU recovery fund, has provided financial support to member states. While these funds have been instrumental in supporting recovery efforts, they have necessitated borrowing by the EU, contributing to the overall increase in public debt levels.

The significant increase in public debt levels poses challenges to fiscal sustainability and long-term debt management. High debt burdens can lead to higher borrowing costs, reduced investor confidence, and potential risks to financial stability. It is crucial for governments to implement effective debt management strategies, including measures such as fiscal consolidation, revenue enhancement, and expenditure rationalization, to ensure debt sustainability in the post-pandemic period. Balancing the need for continued fiscal support and economic recovery with the imperative of managing public debt will be a key policy challenge for European governments. Strategies that promote economic growth, enhance productivity, and attract investment will play a vital role in addressing the consequences of the increased public debt and fostering sustainable economic development in the aftermath of the pandemic.

4.3 Debt Sustainability Concerns

The significant increase in public debt levels resulting from the fiscal responses to the Covid-19 pandemic in Europe has raised concerns about debt sustainability. Debt sustainability refers to the ability of governments to manage and service their debt obligations without compromising long-term fiscal stability and economic growth. Here are some key concerns related to debt sustainability:

- a) **Debt-to-GDP Ratio:** One of the primary indicators used to assess debt sustainability is the debt-to-GDP ratio. When the debt-to-GDP ratio is high, it implies that a large portion of a country's economic output is dedicated to servicing debt. High debt-to-GDP ratios can crowd out productive public spending, limit fiscal flexibility, and potentially lead to higher borrowing costs.
- b) **Debt Service Capacity:** Debt sustainability depends on a government's ability to generate sufficient revenues to meet interest payments and repay principal amounts. If debt service costs become too burdensome, they can strain government budgets and limit resources available for public investments, social programs, and other essential expenditures. A high debt service burden can also increase the vulnerability of countries to financial shocks.
- c) **Investor Confidence and Market Perception:** The perception of debt sustainability plays a crucial role in determining borrowing costs and investor confidence. If markets perceive a country's debt burden as unsustainable, they may demand higher interest rates to compensate for perceived risks. This can further exacerbate the debt servicing challenge and increase the overall cost of borrowing, potentially leading to a negative cycle of higher debt burdens and borrowing costs.
- d) **Macroeconomic Stability:** High levels of public debt can pose risks to macroeconomic stability. Excessive debt can put upward pressure on inflation, crowd out private investment, and reduce the government's ability to respond to future economic downturns or crises. Additionally, a large debt burden can limit the government's fiscal policy options, constraining its ability to implement countercyclical measures and manage future shocks.
- e) **Long-Term Growth Prospects:** Sustainable debt levels are closely linked to long-term economic growth prospects. High debt burdens can hamper economic growth by diverting resources away from productive investments and crowding out private investment.

This can hinder job creation, innovation, and long-term productivity gains, undermining a country's ability to generate sufficient revenues for debt servicing.

Addressing debt sustainability concerns requires a comprehensive approach that combines prudent fiscal management, structural reforms, and policies aimed at promoting sustainable economic growth. This may include measures such as fiscal consolidation, revenue enhancement through tax reforms, expenditure rationalization, and improving the efficiency of public spending. Governments may also need to consider structural reforms that enhance competitiveness, productivity, and resilience to future shocks.

International cooperation and support, including multilateral initiatives and debt restructuring mechanisms, can also play a crucial role in addressing debt sustainability challenges faced by European countries. Collaborative efforts among governments, international organizations, and creditors can help alleviate debt burdens, create fiscal space for investments, and support sustainable economic recovery.

Overall, ensuring debt sustainability is vital for maintaining fiscal stability, preserving investor confidence, and fostering sustainable economic growth in the post-pandemic era. European governments need to strike a balance between addressing immediate economic challenges and implementing prudent debt management strategies to ensure a sustainable fiscal future.

5. Challenges Posed by High Public Debt

High levels of public debt can pose several challenges for an economy and its policymakers. While the specific challenges may vary depending on the country's circumstances and the composition of the debt, here are some common concerns associated with high public debt:

- a) **Debt Sustainability Concerns:** One of the primary challenges of high public debt is the risk to debt sustainability. If the debt burden becomes unsustainable, with debt service costs surpassing the government's ability to generate sufficient revenue, it can lead to a fiscal crisis. This can result in a loss of market confidence, rising borrowing costs, and the need for austerity measures or external financial assistance to restore fiscal stability.
- b) **Crowding Out Effect:** High levels of public debt can crowd out private investment. As governments compete with the private sector for available funds in the financial market, interest rates may rise, making it more expensive for businesses and individuals to borrow. This can lead to reduced private investment, which is a crucial driver of long-term economic growth. The crowding out effect can hinder productivity, innovation, and job creation, hampering the economy's overall potential.
- c) **Financial Stability Risks:** Excessive public debt can pose risks to financial stability. If a large portion of the debt is held by domestic banks or financial institutions, their balance sheets can be vulnerable to potential losses if the government faces difficulties in servicing its debt. This can lead to instability in the financial system, impacting credit availability, investor confidence, and overall economic stability.
- d) **Constraints on Future Fiscal Policy:** High public debt levels can limit the flexibility of future fiscal policy. As a significant portion of government revenue is allocated to debt servicing, there may be limited room for discretionary spending or policy measures to address other socio-economic priorities. This constraint can hinder the government's ability to respond effectively to changing economic conditions or implement necessary reforms.
- e) **Higher Borrowing Costs:** High public debt can result in higher borrowing costs for the government. Investors may demand higher interest rates as compensation for perceived higher risks associated with lending to heavily indebted countries. This increased cost of borrowing can put additional strain on the government's budget, requiring a larger portion of revenue to be allocated to debt servicing rather than productive investments or public services.

6. Policy implications for Balancing Public Debt and Economic Growth

Balancing public debt and economic growth requires a careful and strategic approach to ensure sustainable fiscal practices while fostering an environment conducive to economic prosperity. Here are some policy implications that can help achieve this balance:

- a) **Fiscal Consolidation Measures:** Implementing fiscal consolidation measures is essential to address high levels of public debt. This can involve reducing budget deficits, controlling public spending, and increasing revenue through measures such as taxation reforms. However, it is important to adopt a balanced approach that avoids excessive austerity measures, which can dampen economic growth. Fiscal consolidation should be targeted, prioritizing areas of inefficient spending and unproductive subsidies while preserving investments in critical sectors like education, infrastructure, and innovation.
- b) **Long-Term Debt Management Strategies:** Developing and implementing effective long-term debt management strategies is crucial for managing public debt. This can include refinancing debt to take advantage of lower interest rates,

extending debt maturities to reduce repayment burdens, and actively managing the debt portfolio to optimize cost and risk. Regular debt sustainability analyses should be conducted to assess the affordability and risk associated with debt obligations, and adjustments in debt management strategies should be made accordingly.

c) **Prioritizing Public Investments:** Governments should prioritize public investments that have a positive impact on long-term economic growth and productivity. Strategic investments in infrastructure, education, healthcare, research and development, and sustainable development can create employment opportunities, enhance competitiveness, and stimulate economic growth. Prioritizing high-quality and high-impact investments can yield long-term returns and contribute to debt sustainability.

d) **Structural Reforms to Enhance Productivity:** Implementing structural reforms aimed at enhancing productivity and competitiveness can boost economic growth and generate higher government revenue. This can include measures to improve the business environment, promote innovation, enhance labor market flexibility, invest in human capital, and foster entrepreneurship. Structural reforms can improve the economy's capacity to generate sustainable revenue streams, reduce the need for excessive borrowing, and contribute to long-term debt sustainability.

e) **Monetary Policy Considerations** (no bold and added bullet e): Collaboration between fiscal and monetary authorities is crucial in balancing public debt and economic growth. Coordination between fiscal policy (government spending and taxation) and monetary policy (interest rates and money supply) can help ensure a supportive macroeconomic environment. Central banks should maintain an accommodative monetary policy stance, taking into account the government's debt dynamics and the need to promote economic growth while keeping inflation under control.

f) **International Cooperation and Coordination** (no bold and added bullet f): Global challenges, such as the impact of international financial markets and cross-border capital flows, require international cooperation and coordination. Governments should engage in dialogue and collaboration with international organizations, such as the International Monetary Fund (IMF) and the World Bank, to address common challenges, exchange best practices, and receive technical assistance in managing public debt and promoting economic growth.

7. Case studies: Country Experiences and Lesson Learned

Analyzing the experiences of specific countries can provide valuable insights into the challenges and policy implications of balancing public debt and economic growth. Here, we will examine a few European countries and draw lessons from their experiences:

Greece: Greece provides a notable case study in the context of public debt and economic growth. The country faced a severe debt crisis that had significant implications for its economy and the Eurozone as a whole. Here are some key aspects of Greece's experience:

a) **High Public Debt Levels:** Greece had accumulated high levels of public debt even before the global financial crisis of 2008. Unsustainable fiscal policies, weak economic fundamentals, and inadequate financial governance contributed to the rapid increase in public debt. By 2010, Greece's debt-to-GDP ratio had reached alarming levels, raising concerns about its ability to service the debt.

b) **Loss of Market Confidence:** As Greece's debt burden became increasingly unsustainable, it led to a loss of market confidence in the country's ability to repay its debt. Investors demanded higher interest rates on Greek government bonds, making it more expensive for the government to borrow. The loss of market confidence exacerbated the debt crisis, pushing Greece towards the brink of default.

c) **Austerity Measures and Structural Reforms:** To address the debt crisis, Greece entered into bailout programs with the International Monetary Fund (IMF), the European Commission, and the European Central Bank (ECB). These programs were accompanied by stringent austerity measures and structural reforms aimed at restoring fiscal stability and improving economic competitiveness. The measures included spending cuts, tax increases, pension reforms, labor market reforms, and privatization of state assets.

d) **Economic Contraction and Social Hardships:** The austerity measures implemented in Greece resulted in a deep and prolonged economic contraction. The severe fiscal consolidation and reduction in public spending had a significant impact on the economy, leading to a decline in GDP, high unemployment rates, and social hardships. The Greek population faced income cuts, reduced access to public services, and a decline in living standards.

Lessons Learned: Greece's experience offers valuable lessons for managing public debt and economic growth. It highlights the importance of early detection of unsustainable debt levels, proactive measures to address fiscal imbalances, and the need for a balanced approach that combines austerity measures with growth-oriented policies. The case also underscores the significance of structural reforms to enhance competitiveness, improve governance, and foster sustainable economic growth.

Since the peak of the crisis, Greece has made progress in implementing reforms, stabilizing its economy, and reducing its debt burden. However, the long-term impact of the crisis on Greece's economy and society remains significant, emphasizing the challenges and complexities involved in balancing public debt and economic growth. The Greek case serves as a reminder of the importance of prudent fiscal management, structural reforms, and targeted investments to achieve sustainable debt levels and promote inclusive economic growth.

Germany (BOLD): Germany offers an interesting case study in the context of public debt and economic growth. The country's experience demonstrates effective management of public debt while maintaining strong economic performance. Here are key aspects of Germany's case:

a) **Debt Reduction and Fiscal Discipline:** Following the reunification of East and West Germany in the 1990s, the country faced significant challenges, including high public debt levels. However, Germany implemented prudent fiscal policies, emphasizing fiscal discipline and debt reduction. The government pursued budgetary consolidation, controlled public spending, and implemented structural reforms to improve the efficiency of public administration and social security systems.

b) **Strong Economic Growth:** Germany's commitment to fiscal discipline and structural reforms contributed to robust economic growth. The country experienced sustained economic expansion, driven by strong exports, a competitive manufacturing sector, and a skilled workforce. High productivity and a focus on innovation played a significant role in Germany's economic success.

c) **Investment in Education and Vocational Training:** Germany's emphasis on education and vocational training has been crucial to its economic growth and competitiveness. The country has a well-developed dual education system that combines classroom learning with practical training, equipping students with the skills demanded by the labor market. The emphasis on technical and vocational education has helped maintain a skilled workforce, leading to high productivity and innovation.

d) **Strong Institutions and Sound Debt Management:** Germany benefits from strong institutions, including an independent central bank (the Bundesbank) and a culture of fiscal responsibility. Sound debt management practices have played a crucial role in maintaining low borrowing costs and ensuring debt sustainability. Germany has been able to take advantage of low-interest rates and favorable market conditions to refinance its debt and optimize its debt maturity profile.

e) **Long-Term Planning and Structural Reforms:** Germany's success in managing public debt and fostering economic growth can be attributed, in part, to its long-term planning and commitment to structural reforms. The country has pursued policies aimed at enhancing labor market flexibility, promoting innovation, supporting small and medium-sized enterprises (SMEs), and investing in research and development. These measures have helped maintain competitiveness and adapt to evolving economic challenges.

Strong Social Safety Net: Germany's robust social safety net, including comprehensive healthcare, unemployment benefits, and pension systems, has played a vital role in promoting social cohesion and stability. By providing a safety net for its citizens, Germany has been able to mitigate social hardships and maintain social stability during economic downturns.

The German case illustrates the importance of fiscal discipline, long-term planning, and structural reforms in managing public debt while fostering economic growth. It highlights the significance of investment in education, vocational training, and innovation for maintaining competitiveness. Furthermore, Germany's commitment to sound debt management practices and its strong institutions has helped ensure debt sustainability and favorable borrowing conditions. Other countries can draw lessons from Germany's experience in promoting responsible fiscal policies, enhancing productivity, and achieving sustainable economic growth.

Ireland: Ireland's experience provides valuable insights into managing public debt and promoting economic growth. The country faced a severe economic and fiscal crisis in the late 2000s due to a burst housing bubble and a banking crisis. Here are key aspects of Ireland's approach:

a) **Fiscal Consolidation Measures:** In response to the crisis, Ireland implemented significant fiscal consolidation measures to address its high public debt levels. The government pursued austerity measures, including spending cuts and tax increases, to reduce the budget deficit and restore fiscal sustainability. These measures aimed to control public spending and increase government revenues to bring the debt-to-GDP ratio under control.

b) **Structural Reforms:** Ireland prioritized structural reforms to enhance its economic competitiveness and promote long-term growth. The country implemented labor market reforms, including wage moderation and greater flexibility, to improve employment prospects and restore competitiveness. The government also undertook reforms in the banking sector to enhance financial stability and restore confidence.

- c) **Investment Prioritization:** While fiscal consolidation was necessary, Ireland recognized the importance of targeted investments to support economic growth. The government prioritized strategic investments in sectors such as education, research and development, and export-oriented industries. These investments aimed to enhance Ireland's productivity, innovation capacity, and international competitiveness.
- d) **Export-Led Growth:** Ireland's economic recovery was driven in part by its export-oriented industries. The country's favorable corporate tax regime and business-friendly environment attracted foreign direct investment, particularly from multinational companies. This investment played a significant role in generating export-led growth and job creation.
- e) **EU and IMF Assistance:** Ireland sought external financial assistance from the European Union (EU) and the International Monetary Fund (IMF) to address its fiscal and economic challenges. The assistance came in the form of bailout programs, which included financial support and policy conditionality. These programs provided Ireland with financial stability and helped restore market confidence.

The Irish case demonstrates the importance of striking a balance between fiscal consolidation measures and growth-oriented policies. While austerity measures were necessary to restore fiscal stability, Ireland's prioritization of targeted investments and structural reforms contributed to its economic recovery. The focus on enhancing competitiveness, attracting foreign investment, and investing in key sectors played a crucial role in Ireland's successful rebound.

However, it is important to note that the Irish case also highlights the complexities and challenges involved in managing public debt and achieving sustainable economic growth. The country's recovery process was not without its difficulties, and the long-term impact of the crisis on certain segments of the population, such as the housing market and public services, remains a challenge for policymakers.

Overall, Ireland's experience underscores the significance of a comprehensive approach that combines fiscal consolidation, structural reforms, targeted investments, and external support to navigate the challenges of high public debt and foster economic growth.

7.1 Select European Countries and Their Approaches

Here are three European countries and their approaches to balancing public debt and economic growth:

Netherlands: The Netherlands has a reputation for sound fiscal management and a focus on long-term sustainability. The country prioritizes budgetary discipline and adheres to strict fiscal rules, such as maintaining a balanced budget over the economic cycle. The government has implemented measures to control public spending, including pension reforms and efficiency improvements in public services. The Netherlands also emphasizes investments in education, research, and innovation to enhance productivity and economic competitiveness.

Italy: Italy has faced persistent challenges with high public debt levels. The country has pursued a combination of fiscal consolidation measures and structural reforms. Italy aims to reduce public spending and increase tax revenues to improve its fiscal position. The government has implemented reforms to address labor market inefficiencies, increase competitiveness, and simplify bureaucracy. Italy also focuses on promoting investment, innovation, and entrepreneurship to stimulate economic growth.

Sweden: Sweden has adopted a balanced approach to public debt and economic growth. The country emphasizes fiscal responsibility while prioritizing investments in education, research, and innovation. Sweden has implemented measures to control public spending and maintain a sustainable fiscal policy. The government also emphasizes social welfare programs to ensure a high standard of living and reduce inequality. Sweden's focus on education and innovation aims to foster long-term economic growth and competitiveness.

These countries illustrate different approaches to balancing public debt and economic growth, reflecting their unique economic, political, and social contexts. The Netherlands emphasizes fiscal discipline and long-term sustainability, Italy focuses on fiscal consolidation and structural reforms, and Sweden combines responsible fiscal management with investments in education and innovation. Each approach reflects the specific challenges and priorities of the respective countries.

7.2 Evaluation of Policy Effectiveness

Evaluating the effectiveness of policies aimed at balancing public debt and promoting economic growth requires a comprehensive analysis of various factors. Here are some key aspects to consider when evaluating policy effectiveness:

- a) **Economic Indicators:** Assessing the impact of policies on key economic indicators is essential. These indicators may include GDP growth, employment rates, inflation, productivity, and investment levels. Positive changes in these indicators suggest that policies have been effective in stimulating economic growth and improving overall economic performance.

- b) **Fiscal Metrics:** Examining fiscal metrics such as budget deficits, public debt levels, and debt sustainability is crucial. Effective policies should result in a reduction in budget deficits, a stabilization or decrease in public debt-to-GDP ratio, and improved long-term fiscal sustainability.
- c) **Sector-Specific Analysis:** Policies often target specific sectors or industries. Evaluating their impact on these sectors can provide insights into policy effectiveness. For example, policies promoting innovation and technological advancements should be assessed based on indicators such as patent registrations, research and development expenditures, and the growth of innovative industries.
- d) **Employment and Income Distribution (NO BOLD):** Policies should aim to create a favorable environment for job creation and improve income distribution. Assessing changes in unemployment rates, wage levels, and income inequality can help determine whether policies have been effective in promoting inclusive growth and reducing income disparities.
- e) **Social Impact:** Policies should also be evaluated in terms of their social impact. This includes assessing access to healthcare, education, and social welfare programs. Policies that contribute to improved social well-being, poverty reduction, and enhanced social mobility are considered more effective.
- f) **Long-Term Sustainability:** Policy effectiveness should be evaluated in terms of their long-term sustainability. This involves assessing the environmental impact of policies, resource allocation, and intergenerational equity considerations. Policies that promote environmental sustainability, responsible resource management, and account for future generations are more likely to be deemed effective.
- g) **International Comparison:** Comparing policy outcomes with those of similar countries or regions can provide insights into their effectiveness. Analyzing how a country's performance measures up against its peers in terms of economic growth, fiscal management, and social indicators can help identify successful strategies or areas for improvement.

It is important to note that policy effectiveness is often context-specific, and causality can be challenging to establish definitively. Therefore, employing a combination of quantitative and qualitative methods, including statistical analysis, case studies, and expert opinions, can provide a more comprehensive evaluation of policy effectiveness.

7.3 Key Lessons and Best Practices

Through the analysis of various countries' approaches to balancing public debt and economic growth, several key lessons and best practices can be identified. Here are some important lessons and best practices:

- a) **Fiscal Discipline:** Maintaining fiscal discipline is crucial for managing public debt effectively. Countries that prioritize prudent fiscal management, such as Germany and the Netherlands, have been able to achieve lower debt levels and greater fiscal sustainability. Implementing fiscal rules and adhering to them can help ensure responsible fiscal behavior.
- b) **Structural Reforms:** Structural reforms play a vital role in enhancing competitiveness and promoting sustainable economic growth. Reforms in areas such as labor markets, pensions, taxation, and regulatory frameworks can improve efficiency, productivity, and investment climate. Countries like Ireland and Spain have successfully implemented structural reforms to address economic imbalances and drive growth.
- c) **Targeted Investments:** Strategic investments in areas such as education, research and development, infrastructure, and innovation can contribute to long-term economic growth and productivity. Prioritizing investment in sectors with high growth potential and promoting public-private partnerships can foster innovation, attract investment, and boost competitiveness.
- d) **Balancing Austerity Measures:** While fiscal consolidation measures are necessary to address high public debt levels, it is crucial to strike a balance between austerity measures and policies that support growth. Overly aggressive austerity measures can have adverse effects on economic activity and social welfare. A more balanced approach, as seen in Sweden, can help mitigate negative impacts while maintaining fiscal discipline.
- e) **Social Cohesion:** Considering the social impact of policies is essential. Measures that promote social cohesion, reduce income inequality, and protect vulnerable groups contribute to long-term stability and sustainable growth. Investing in education, healthcare, and social safety nets can create a more inclusive and equitable society.
- f) **Flexibility and Adaptability:** Economic conditions and external factors can change rapidly, as seen during the Covid-19 pandemic. Countries that demonstrate flexibility and adaptability in their policy responses can better manage crises and promote recovery. Flexibility in fiscal policy, employment regulations, and support for businesses can help mitigate the adverse effects of economic shocks.

g) **International Cooperation:** Collaboration and coordination among countries and international organizations are crucial for addressing global economic challenges. Sharing best practices, learning from each other's experiences, and coordinating policy actions can lead to more effective and sustainable solutions.

It is important to note that each country's context and circumstances differ, and there is no one-size-fits-all approach. Policy choices should be tailored to the specific needs and challenges of each country. Nevertheless, incorporating these lessons and best practices can provide valuable guidance for policymakers in their efforts to balance public debt and promote sustainable economic growth.

8. Conclusion

8.1 Summary of Key Findings

In summary, the discussion on public debt and economic growth in Europe after the Covid-19 pandemic has yielded several key findings:

- a) Public debt, defined as the accumulation of government borrowing, has a complex relationship with economic growth. While high levels of public debt can hinder economic growth, moderate levels of debt can be manageable and even necessary during times of crisis to support economic recovery.
- b) The role of public debt in times of crisis is significant. During economic downturns, governments often increase spending and take on debt to stimulate the economy, protect jobs, and provide necessary support to businesses and individuals. Public debt can play a crucial stabilizing role during periods of economic turmoil.
- c) The Covid-19 pandemic has led to a significant increase in public debt levels across European countries. Governments implemented expansive fiscal measures, including increased spending and tax relief, to address the economic impact of the pandemic. This has resulted in a substantial accumulation of debt, raising concerns about debt sustainability and the long-term implications for economic growth.
- d) High public debt poses several challenges. It can lead to increased interest payments, crowding out private investment, and potential financial stability risks. Additionally, high levels of debt may limit the scope for future fiscal policy, reducing flexibility in responding to future economic shocks or undertaking necessary investments.
- e) Balancing public debt and economic growth requires policy implications that include fiscal consolidation measures, long-term debt management strategies, prioritization of public investments, structural reforms to enhance productivity, consideration of monetary policy, and international cooperation and coordination.
- f) Case studies of European countries such as Greece, Germany, Ireland, the Netherlands, and Sweden highlight different approaches to managing public debt and promoting economic growth. These countries employ a range of strategies, including fiscal discipline, structural reforms, targeted investments, and social cohesion measures, to address the challenges posed by high public debt and achieve sustainable economic growth.

Overall, the findings emphasize the importance of striking a balance between managing public debt and fostering economic growth. It requires careful policy considerations, evaluation of effectiveness, and tailored approaches that take into account the specific circumstances and challenges faced by each country. By adopting effective strategies, European countries can navigate the challenges posed by high public debt and pave the way for resilient economies and sustainable growth in the post-pandemic era.

8.2 Policy Recommendations for European Governments

Based on the challenges and key findings discussed, the following policy recommendations can be suggested for European governments to balance public debt and promote economic growth:

- a) **Fiscal Consolidation:** Implementing fiscal consolidation measures is essential to reduce budget deficits and stabilize public debt levels. Governments should focus on containing spending, enhancing revenue collection, and improving the efficiency of public expenditures. This may include reducing non-essential expenses, optimizing public sector operations, and streamlining subsidy programs.
- b) **Long-term Debt Management:** Developing effective long-term debt management strategies is crucial to ensure debt sustainability. Governments should explore options for refinancing existing debt, optimizing debt maturity profiles, and diversifying funding sources. This may involve issuing longer-term bonds, engaging in liability management operations, and actively managing debt portfolios to minimize risks and reduce borrowing costs.
- c) **Prioritizing Public Investments:** Governments should prioritize public investments that have the potential to generate long-term economic growth and enhance productivity. This includes investments in infrastructure, education, research and development, digitalization, and green technologies. Careful project selection, cost-benefit analysis, and public-private partnerships can maximize the impact of public investments while minimizing fiscal risks.

- d) **Structural Reforms:** Undertaking structural reforms is vital to improve competitiveness, labor market flexibility, and overall economic efficiency. Governments should focus on areas such as labor market regulations, tax systems, business regulations, and pension reforms. By removing barriers to entrepreneurship, encouraging innovation, and improving the business environment, countries can attract investment, foster productivity growth, and stimulate economic activity.
- e) **Monetary Policy Considerations:** Cooperation between fiscal and monetary authorities is crucial for balancing public debt and economic growth. Central banks should adopt accommodative monetary policies to support economic recovery, while maintaining price stability and financial system resilience. Close coordination and communication between fiscal and monetary authorities can help ensure a coherent policy approach.
- f) **International Cooperation and Coordination:** European countries should engage in international cooperation and coordination to address common challenges related to public debt and economic growth. Sharing best practices, exchanging experiences, and coordinating policy actions can enhance policy effectiveness and promote collective solutions to global economic issues.
- g) **Social Safety Nets and Inclusive Policies:** To mitigate the social impact of fiscal consolidation measures, governments should prioritize social safety nets and inclusive policies. This includes targeted support for vulnerable groups, investment in education and skills development, and promoting equal access to healthcare and social services. Inclusive policies can help reduce income inequality, enhance social cohesion, and ensure that the benefits of economic growth are shared equitably.

It is important for policymakers to tailor these recommendations to their specific national contexts, considering their economic conditions, political dynamics, and social priorities. Continuous evaluation, monitoring, and adaptation of policies based on their effectiveness and changing circumstances are essential for achieving sustainable and balanced growth while managing public debt responsibly.

8.3 Future Research Directions

While significant research has been conducted on the relationship between public debt and economic growth, there are several areas that warrant further exploration. Future research directions could include:

- a) **Dynamic Analysis:** Conducting dynamic analysis to examine the long-term effects of public debt on economic growth is crucial. This involves considering the time-varying nature of the debt-growth relationship and capturing the potential non-linearities and threshold effects. Understanding how debt accumulation and its impact on growth evolve over time can provide valuable insights for policymakers.
- b) **Heterogeneous Effects:** Investigating the heterogeneous effects of public debt on economic growth across different countries, regions, and economic conditions is important. Factors such as institutional quality, fiscal governance, monetary policy frameworks, and structural characteristics can influence the debt-growth relationship. Research should delve deeper into understanding how these factors interact and shape the outcomes.
- c) **Causal Relationships:** Establishing causal relationships between public debt and economic growth remains a challenge. Future research should employ rigorous econometric techniques, such as instrumental variable approaches and natural experiments, to overcome endogeneity issues and improve causal inference. This would help in obtaining more robust and reliable estimates of the debt-growth relationship.
- d) **Policy Evaluation:** Conducting comprehensive evaluations of policy effectiveness is essential. This involves assessing the outcomes of specific policy interventions, such as fiscal consolidation measures, structural reforms, and targeted investments. Comparative studies across countries and over time can provide valuable insights into the effectiveness of different policy approaches in balancing public debt and promoting economic growth.
- e) **External Factors:** Examining the impact of external factors on the debt-growth relationship is important. Global economic conditions, international financial markets, and exchange rate dynamics can influence a country's ability to manage its debt and achieve sustainable growth. Analyzing how external factors interact with domestic policies can provide a more comprehensive understanding of the dynamics at play.
- f) **Sustainable Development Goals:** Investigating the linkages between public debt, economic growth, and the achievement of sustainable development goals (SDGs) is an emerging area of research. Understanding how public debt management strategies and economic policies can contribute to sustainable development, including environmental sustainability and social inclusiveness, is crucial for designing effective policy frameworks.
- g) **Behavioral and Political Economy Perspectives:** Incorporating behavioral and political economy perspectives can enhance our understanding of public debt dynamics and policy outcomes. Research should explore how cognitive biases,

political considerations, and public attitudes towards debt influence decision-making and policy choices. This can shed light on the challenges and constraints faced by policymakers in managing public debt and fostering economic growth.

By exploring these future research directions, scholars can deepen our understanding of the complex relationship between public debt and economic growth, provide valuable insights for policymakers, and contribute to the development of evidence-based policy frameworks.

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Health and Clinical Governance: A Systematic Literature Review

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Received: November 19, 2023 Accepted: December 20, 2023 Online Published: December 31, 2023

doi:10.5539/res.v15n4p44

URL: <https://doi.org/10.5539/res.v15n4p44>

Abstract

This systematic literature review covers the extant literature on health and clinical governance. Using a sample of 103 studies published in 2014-2022, we categorize those papers based on the methods employed, the theoretical framework, the thematology and others. We underline the interdisciplinary of the clinical governance, that mostly examined in developed countries through qualitative methodologies (case studies, surveys and others). Particularly, we give prominence to the need for conducting more research that employs a worldwide sample, quantitative methods that prove empirical evidence on the balance that needs to be achieved on, most of the time, conflicting matters that revolve around clinical and health governance.

Keywords: Corporate Governance, health governance, clinical governance, governance in hospitals, CSR, Risk

Classification codes: H00, I1, P00, M14, M4

1. Introduction

The motivation behind this systematic literature review is the lack of research that systematically reviews the existing literature on health ecosystem. Particularly, identifies and categorizes the concepts of health governance. According to Lipunga et al. (2019), governance in health could be distinguished in health system governance and organizational or clinical governance. We can define health system the system that contains the entire population of health system actors, therefore health system governance includes every measure taken by formal authorities (Health Ministries and others) to promote and protect the health of the population (Lipunga et al. 2019). Organizational governance or governance of organizations in health is the corporate governance adjusted to the unit(for instance hospitals) of health(Lipunga et al. 2019).

Post pandemic outlook of healthcare and especially in the current environment of high inflation and slow economic growth, will be translated to lower spending in relative services. Therefore, tough decision making is expected. Also, as presented in the current systematic literature review, digitalization of healthcare is unavoidable, however the relative data will be under extreme scrutiny and public policy initiatives will regulate the use of them in developed countries and regions such as United States of America and European Union. This is to be expected as health and clinical governance is heavily regulated.

At the same time, according to World Health Organization and the conclusions of our systematic literature, human societies are far from making a significant process into achieving universal health coverage that is one of the Sustainable Development Goals by 2030. Therefore, by contributing a systematic literature review on health and clinical governance we recognize and discuss current trends methodologies and theories revolve around health and clinical governance.

This allows us to take into consideration institutional and political environments that interact within the different themes of clinical and health governance. Consequently, our study offers relevant insights that could be transferable to settings worldwide that present a variety of macro-economic and political conditions.

We employ the population of research published in journals that are ranked in ABS guide. Using Google Scholar as well as other databases (Nguyen et al., 2020), we search for papers based on the following keywords: “corporate governance healthcare”, “clinical governance”. We choose to search for literature published during the period of 2014-2022, so that we can be relevant and novel enough. Our search provides us with a total number of 103 studies. Our systematic literature review undertakes the effort to identify patterns in health governance research, underline key concerns, and propose new

paths of research. To achieve this goal our systematic literature review examines the general characteristics of the literature, that is its descriptive statistics like the number of countries each paper analyzes, its academic discipline as categorized by ABS and others. The descriptive statistics of each and every paper in our systematic literature review is presented in Table I. Further, this systematic literature review categorizes research based on the issues each paper deals with and it is presented in Table II. Finally, our systematic literature review provides proposals for future research based on the conclusions derived from Tables I and II as well as the proposals of each paper.

We find that significantly more studies are conducted deploying one country as subject of examination. Also, researchers examine clinical and health governance under the scope of a wide range of disciplines such as accounting, economics, corporate social responsibility and ethics, social sciences, public policy and others.

We also find that qualitative analysis is the method of choice for the majority of researchers in the field such as case studies and essays to examine the different themes of clinical governance. Further we categorize a wide range of topics relative to clinical governance such as the regulation and policy that revolves around health and clinical governance, the privatization and corporatization in healthcare, the board characteristics of healthcare organizations and how those interact with different aspects of health organizations, the corporate social responsibility in the concept of healthcare, the risk management, the models and tools employed to assess the performance of healthcare organizations, the cost accounting and financial performance, the changes in health governance systems, the cyber security and digital transformation, the governance of human resources and innovation. Also, theoretical frameworks employed present a high level of diversity in terms of academic discipline origins. For instance, research employs new management theory that usually explains public policy studies as well as agency theory that is widely established in accounting and finance literature. However, relatively few research puts its findings into theoretical perspectives.

Our study provides some useful directions to policy makers, researchers and other stakeholders concerned with the current state and main issues in healthcare governance. Strong cooperation among stakeholders is a prerequisite for the improvement of healthcare quality (Van De Bovenkamp et al. 2014; Pacey et al. 2017; Tenbensen et al. 2021), which means that deep knowledge of the governance of healthcare and clear policy initiatives (Lipunga et al. 2019; Nicaise et al. 2014; Bali and Ramesh 2017) as well as accountability and quality systems in place (Côté-Boileau et al. 2021; Bali and Ramesh 2017; Tenbensen et al. 2021) are essential. Studying best practices from around the world could be the starting point for the acquisition of this expertise on clinical governance, however mere “copy-paste” of foreign policies on health governance without taking into consideration institutional and other factors as well as fiscal capacities will be inefficient on the long term (Bali and Ramesh 2017). Ultimately, balance in the majority of contradictory healthcare concerns is the answer most of the times. and van de Bovenkamp 2015), but mere “copy-paste” of foreign policies on health governance without taking into consideration institutional and other factors as well as fiscal capacities will be inefficient on the long term (Bali and Ramesh 2017).

The remainder of the paper unfolds as Section 2 portrays the methodology of our systematic literature review, Section 3 presents the results of the systematic literature review and Section 4 provides the conclusion.

2. Methodology: Systematic Literature Review

We employ the population of research published in journals that are ranked in ABS guide. Using Google Scholar as well as other databases (Nguyen et al., 2020), we search for papers based on the following keywords: “corporate governance healthcare”, “clinical governance”. We choose to search for literature published during the period of 2014-2022, so that we can be relevant and novel enough. Our search provides us with a total of 103 studies.

3. Results

3.1 Descriptive Statistics (5 Criteria)

The descriptive statistics of each and every paper in our systematic literature review is presented in Table I.

Table 1. Descriptive statistics (5 criteria)

A. Countries per study			C. Journal ranks	
A.1	Single	67 (65%)	C.1. 1	36 (35%)
Country studies				
A.2	Multi Country studies	13 (13%)	C.2. 2	34 (33%)
A.3	N/A	23 (22 %)	C.3. 3	16 (16%)
Total number of studies			C.4. 4	17 (16%)

B. Academic field		D. Continent & Region	
B.1. Accounting	3	D.1. Europe	42
B.2. Economics	4	D.2. Asia	8
B.3. Ethics-CSR-Man	14	D.3. Worldwide	8
B.4. ENT-SBM	2	D.4. America	8
B.5. Soc-Sci	10	D.5. Africa	3
B.6. Sector	3	D.6. Oceania	7
B.7. Or&Mansci	2	D.7. Middle East	1
B.8. Ib&Area	2		
B.9. Ops&Tech	4		
B.10. Pub Sec	51		
B.11. INNOV	2		
B.12. INFO MAN	3		
B.13. MKT	1		
B.14. HRM&EMP	1		
E. State of Development (MSCI classification)			
E.1. DEVELOPED	No.	E.2. EMERGIN G	No.
United States of America	9	Mexico	1
Canada	6	South Africa	2
Netherlands	8	Chile	1
France	2	India	4
UK	23	Poland	2
Germany	3	Turkey	2
Australia	10	Greece	3
Spain	3	Brazil	2
Italy	11	China	4
South Korea	3	Russia	1
Japan	2	Czech Republic	3
Ireland	5	Estonia	1
Finland	4	Hungary	2
Belgium	4		
Portugal	2		
Denmark	3		
Norway	3		
New Zealand	8		
Sweden	3		
Austria	2		
Switzerland	2		
Israel	2		
		E.3. FRONTLINE	No.
		Iceland	1
		Slovenia	1
		Bangladesh	2
		E.4. STANDALO	
		Palestine	1

3.1.1 Countries Per Study

Single-country sample studies are the majority (65% of our sample). Multi-country studies represent 13% of the sample. Studies that do not disclose the country they refer to represent the 22% of our sample and are depicted in A.3.

3.1.2 Academic Field

The Academic Journal Guide (2021) ranks the journals within our research sample has been published. We observe that most research is published in journals concerned with public sector-related affairs. Also, many studies focus on sociology

and ethics-corporate social responsibility issues. This could be explained by the fact that healthcare is mainly a public policy concern.

3.1.3 Journal Ranks

The Academic Journal Guide (2021) ranks the journals within our research sample has been published. The lower ranking is 1 and 4 is the highest ranking of a journal in this guide. Most of the papers are published in journals that are ranked as 1 (35%).

3.1.4 Continent & Region

The geography of our reviewed studies has been categorized through Morgan Stanley Capital International (MSCI) equity index classification(Koutoupis et al. 2021; Neratzidis et al. 2020). Most of the studies analyze countries from Europe (42 papers).

3.1.5 State of Development (MSCI Classification)

The level of development for each study's sample is specified through Morgan Stanley Capital International (MSCI) equity index (Koutoupis et al. 2021; Nerantzidis et al., 2020). From the above it seems that more authors should conduct research in emerging economies.

3.2 Methods, Theory and Themes(3 Criteria)

We attempt to spot patterns of the research that revolve around clinical governance. This is achieved through three criteria, which we report in Table II.

Table II. Methods, Theory and Themes (3 criteria)

E. Methods	
E.1. Regression/ Parametric Analysis	10
E.2.Smart PLS-SEM	1
E.3. Case Study	16
E.4. Survey	6
E.5. Descriptive Statistics/Non parametric analysis	2
E.6. Essay	17
E.7. Multi criteria analysis	1
E.8. Literature Review	8
E.9. Cluster analysis	2
E.10.Case study and interview	26
E.11.Case study and survey	3
E.12. Factor analysis	1
E.13. Survey and principal component analysis	1
E.14. Survey and regression	5
E.15. Literature review and survey	2

F. Theory

- F1. New public management theory
Turner and Wright (2022)
Moffatt et al. (2014)
Byrkjeflot and Jespersen (2014)
Tenbensen et al.(2021)
Burgess et al. (2015)
- F.2 Resource dependence theory
Joshua and Washington (2019)
Mannion et al. (2015)
- F.3 Institutional theory
Joshua and Washington (2019),Burton-Jones et al. (2020), Côté-Boileau et al. (2021), Lipunga et al. (2019)
- F.4. Structuration theory
Joshua and Washington (2019)
- F.5. Shareholder theory
Kuzey et al. (2021)
- F.6. Stakeholder theory
Kuzey et al. (2021)
Russo (2016)
Abhayawansa and Azim (2014)
Mannion et al. (2015)
- F.7. Common good theory
Russo (2016)
- F.8. Resource-based view
Cobben et al. (2022)
- F.9. Behavioral theory
Cobben et al. (2022)
- F.10. Complexity theory
Favaretti et al. (2015)
- F.11. Legitimacy theory
Agarwal et al. (2018)
Abhayawansa and Azim (2014)
- F.12. Agency theory
Bali and Ramesh (2017)
Abhayawansa and Azim (2014)
Mannion et al. (2015)
-

F.13. Relational resource based view	Dobrzykowski et al. (2015)
F.14. Upper echelons theory	Prentini et al. (2015) de Harlez and Malagueno (2016)
F.15. Rhetorical genre theory	O'Meara et al. (2017) O'Meara et al. (2018)
F.16. Stewardship theory	Mannion et al. (2015)
F.17. Critical mass theory	Veronesi et al. (2015)
F.18. Self determination theory	Spehar et al. (2015)
F.19. Expert leadership theory	Tasi et al. (2019)
G. Themes	
G1. Regulation and policy	Stoopendaal and van de Bovenkamp (2015) McDermott et al. (2015) Price et al. (2020) Fournier and Jobin (2018) Van De Bovenkamp et al. (2014) Waring et al. (2016) Bali and Ramesh (2017) Gauld and Horsburgh (2020) Gauld and Horsburgh (2015) Côté-Boileau et al. (2021) Akmal and Gauld (2021) Timmons et al. (2014) Nicaise et al. (2014) Tenbensen et al. (2021) Pacey et al. (2017) Lipunga et al. (2019) Banerjee et al. (2017) Greve et al. (2022) Lucas et al. (2022) Nutti and Seghieri (2014)
G2. Health privatization and corporatization	Turner and Wright (2022) Hunter and Murray (2019) Pirozek et al. (2015) Rahman (2020) Liu et al. (2021) Jones and Hameiri (2021) Fotaki (2014)

G.3. Board Diversity/Board characteristics	Tsui et al. (2022) Ellwood and Garcia-Lacalle (2015) Veronesi et al. (2015) Mannion et al. (2015) Ellwood and Garcia-Lacalle (2016) Preneestini et al. (2015) Kalaitzi et al. (2017) Leung et al. (2020) Bakalikwira et al. (2017) Freeman et al. (2016)
G.4 CSR/Sustainability	Russo (2016) Rattan et al.(2022) Johansen et al. (2018) Minguela-Recover et al. (2022) Levy (2021) Agarwal et al. (2018) Sendawula et al. (2018) Kuzey et al. (2021) Mousa and Othman (2020) Pinzone et al. (2015)
G.5. Risk Management	Cobben et al. (2022) Phipps (2021) Chaudhri et al. (2021) Phipps (2020) Martin et al. (2015) Wilson (2022) Sharma et al. (2021) Koutoupis et al. (2022) Joshua and Washington (2019)
G.6 Healthcare governance quality/Assessment model	Favaretti et al. (2015) Bhat et al. (2019) Paoloni et al. (2022) Nuti et al. (2017) Mosadeghrad (2015) Hallam and Contreras (2018) McCarthy et al. (2016) Ryynänen and Harisalo (2018) Locock et al. (2014) Boaz et al. (2016) Exworthy et al. (2017) Renedo and Marston (2015) Martin et al. (2021)
G.7 Cost accounting/Financial	Wanke et al. (2022) da Silva Etges et al. (2019). Moro Visconti (2014)

performance	Romiti et al. (2022)
G.8. Changes in health governance systems	Wendt (2014) Trein (2017) Allan et al. (2014) Barbazza et al. (2015)
G.9. Cyber security/Digital transformation	Garcia-Perez et al. (2022) Burton-Jones et al. (2020) Abraham et al. (2019) Khanra et al. (2020)
G.10. Human resources innovation	Van den Broek et al. (2018) Moffatt et al. (2014) Byrkjeflot and Jespersen (2014) de Harlez and Malagueno (2016) Spehar et al. (2015) Spurgeon, et al. (2015) Burgess et al. (2015) O'Meara et al. (2018) O'Meara et al. (2017) Tasi et al. (2019) Aitken and Von Treuer (2014) Brown (2020) Abor, (2019) Maier (2015) Aubry et al. (2014)
G.11. Governance of innovation	Secundo et al. (2018) Dobrzykowski et al. (2015) Proksch et al. (2019) McKelvey et al. (2018) Baird et al. (2014) Abhayawansa and Azim (2014) Cucciniello and Nasi (2014) Scillitoe et al. (2018)

3.2.1 Methods

Most of our sampled research follows qualitative methods (case studies and essays). Regression analysis is employed by ten studies of our sample. Also, ten studies of our sample are literature review studies. Specifically, previous literature review focuses on the corporatization of healthcare organizations (Turner and Wright 2022), CSR in healthcare (Russo 2016) and the barriers women face in healthcare, academia, and business (Kalaitzi et al. 2017). Therefore, our systematic literature review is the first one that tries to present a wide scope of clinical governance.

3.2.2 Theory

We allocate the studies based on the theoretical framework employed to explain empirical and theoretical observations and analyses. Particularly, we categorize the empirical and theoretical studies on clinical governance based on the theories employed by authors to explain empirical and theoretical observations. We observe that the literature refers to clinical governance employ theory that refers to: (F.1) New public management theory, (F.2.) Resource dependence theory, (F.3.) Institutional theory, (F.4) Structuration theory, (F.5) Shareholder theory, (F.6) Stakeholder theory, (F.7) Common good theory, (F.8) Resource Based View, (F.9) Behavioral theory, (F.10) Complexity theory, (F.11) Legitimacy theory,(F.12) Agency theory, (F.13) Relational resource based view, (F.14) Upper echelons theory, (F.15) Rhetorical genre theory, (F.16) Stewardship theory,(F.17) Critical mass theory,(F.18) Self-determination theory,(F.19). Expert leadership theory.

3.2.2.1 New Public Management Theory

Scholars from United Kingdom and Australia invent this term to describe the effort on behalf of public sector to assimilate private sector practices as an antidote to its inefficiency (Turner and Wright 2022). Tenbensen et al. (2021), recognize new public management as one of the three ideal types of public management, that is traditional public administration, new public management and new public governance. New Public Management recognizes the market as a core mechanism of social coordination, while New Public Governance recognizes collaborative networks for the cause. As a source of legitimacy, New Public Management sees the state as a steerer and purchaser, while New Public Governance gains its legitimacy from the public value it creates through the collaboration of state with non-state actors and its capacity to address complex problems (Tenbensen et al. 2021).

In New Public Governance, policy formulation and implementation is co designed with those who implement those policies. In New Public Management, state designs and implementers, implement the policy (Tenbensen et al. 2021).

Another key difference between New Public Management and New Public Governance is the perception on usage of performance indicators. New Public Management uses performance indicators to monitor performance while in New Public Governance performance indicators are used as a learning and joint problem-solving tool (Tenbensen et al. 2021).

In the New Public Management terrain the target setting and monetary performance incentives are the policy strategies to improve health system. In New Public Governance there is the drive for quality improvement processes, data sharing and informal benchmarking (Tenbensen et al. 2021). Nowadays, there is the tendency to form a hybrid type of management that combines New Public Management and New Public Governance (Byrkjeflot and Jespersen 2014; Tenbensen et al. 2021; Burgess et al. 2015) that will solve the productivity problem of national health services (Moffatt et al. 2014).

3.2.2.2 Resource Dependence Theory

Theories presented in this subsection are widely known in the corporate governance field. For instance, resource dependence theory is among the most common theories that research utilizes to explain board behavior that also applies to board of directors that serve in healthcare (Mannion et al. 2015). Particularly, resource dependency perceives organizations as a structure of tangible and intangible assets that operates in dynamic ways. In this view, board of directors' function is to provide to the organization the influence and resources (Mannion et al. 2015). Specifically, to the healthcare framework the management of public Intensive Care Unit is explained through resource dependence theory (Joshua and Washington 2019).

3.2.2.3 Institutional and Structuration Theory

Institutional theory claims that people and organizations function in ways that secure social legitimacy. Socially legitimate behaviors overtime become institutionalized and fundamentals of governance and govern the health system (Lipunga et al. 2019).

The apprehension and improvement of digital transformation in healthcare is facilitated through the theoretical framework of institutional theory for all stakeholders (Burton-Jones et al. 2020).

However, structures that compose institutions are not strictly exogenous. The interface at which an actor meets a structure is termed "structuration" hence there is structuration theory.

3.2.2.4 Shareholder Theory

Shareholder theory refers to the shareholder view and portrays the maximization of shareholder wealth as the ultimate purpose. In this sense, by becoming more socially concerned a firm drifts apart from its ultimate purpose according to the classical view (Kuzey et al. 2021).

3.2.2.5 Stakeholder Theory

Contrary to the shareholder view, stakeholder theory suggests that taking into consideration and prioritizing the needs of stakeholders too, it enhances the good testimony of a company. This improved image of the stakeholder oriented firm, positively affects its performance too (Kuzev et al. 2021).

3.2.2.6 Common Good Theory

In the concept of healthcare, common good theory suggests that cooperation among the healthcare sector's participants is important to achieve the common goal that is to adequately satisfy health needs (Russo 2016).

3.2.2.7 Resource-Based View Theory

Our literature review finds one study that builds upon the resource-based view theory in family firms. Specifically, due to long term outlook and generational wealth that they try to create and sustain they are more likely to continuously try to capture value through open innovation (Cobben et al. 2022).

3.2.2.8 Behavioral Theory

Family firms usually do not tolerate high levels of risk and tend to be more closed up because of fear of losing control and the concentrated ownership. This tendency is explained by behavioral theory (Cobben et al. 2022).

3.2.2.8 Complexity Theory

Changes in systems are provoked by interactions and feedback loops, a process that is constant. Complexity theory does not consider those systems as the subsequent sum of its different parts. Complexity theory views those systems as totally different entity that has little to do with the interactions mentioned above. Once it is formed the system it cannot be reduced to the original parts. In this sense, Favaretti et al. (2015) approach their quality assessment of integrated clinical governance.

3.2.2.9 Legitimacy Theory

Legitimacy states that the existence of an organization is possible and totally dependent on society's perception about whether its operation alignment with societal and institutional expectations (Abhayawansa and Azim2014).

3.2.2.10 Agency Theory

Agency theory is a widely employed theoretical framework. Agency theory assumes that, unless scrutinized, staff will try to serve their own interests rather than wider organizational objectives that are inclined to stakeholders' interests (opportunism) (Mannion et al. 2015). Board in this setting functions as a monitor meant to ensure compliance by developing systems that check, monitor and control staff that accounts for its operation (Mannion et al. 2015). In a wider spectrum of healthcare governance, the agency model describes the interaction between users (patients), providers (doctors) and third-party payers (Bali and Ramesh2017). The oversight on behalf of governments is limited to a medical council or guidelines on the use of pharmaceuticals and technology (Bali and Ramesh 2017).

3.2.2.11 Relational Resource Based View (RRBV) Theory

The traditional resource-based view theory assumes that an organization controls the resources that he needs to create value. However, the relational resource-based view theory suggests that resources are not fully controlled by the organization and how this affects a firm's ability to develop competitive advantages and firm performance. In our literature review, in the concept of clinical governance, Relational Resource Based View (RRBV) suggests that patients along with doctors create value together (Dobrzykowski et al. 2015).

3.2.2.12 Upper Echelons Theory

The upper echelon theory suggests that values and beliefs held by top management are to be of utmost importance as management culture might strongly influence the focus of the strategy and the behaviors of the staff (Prenestini et al. 2015). In the concept of clinical governance, there are differences between top level management with clinical background and top-level management with administrative background, as clinician managers take better decisions in matters that are more relative to their clinical background as they employ procedures and informal sources information which falls into the upper echelons theory (de Harlez and Malagueno2016).

3.2.2.13 Rhetorical Genre Theory

Genre commonly perceived as a categorization term for movies and books according to the story being told by them. Through genre, the viewer or the reader can identify beforehand the story that is about to read or watch. In the concept of health governance and specifically paramedics, rhetorical genre theory could explain the frictions between the traditional model where doctors provide medical direction to paramedics and the new model of paramedics' self-regulation (O'Meara et al. 2017; O'Meara et al. 2018).

3.2.2.14 Stewardship Theory

Executives in this theoretical framework are not opportunists and serve as effective stewards of an organization's resources. Further, board focuses on cultivating an environment of values and enabling people under them, rather than monitoring and forcing performance (Mannion et al. 2015).

3.2.2.15 Critical Mass Theory

Critical mass theory, suggests that hospital board of directors are better able to exert their authority and serve their cause when each member category is equally represented (Veronesi et al. 2015).

3.2.2.16 Self Determination Theory

According to self-determination theory, people are inclined to activities that give them satisfaction. On the contrary, people will refrain from activities that do not give them satisfaction (Spehar et al. 2015).

3.2.2.17 Expert Leadership Theory

In the healthcare context, expert leadership theory suggests that besides managerial experience (knowledge, capabilities and industry experience), a clinical background is highly desirable (Tasi et al. 2019).

3.2.3 Themes

We discern a wide range of themes that is presented below.

3.2.3.1 Regulation and Policy

Papers in this section examine the health or clinical governance under the scope of state policy and regulation. Governance and regulation are intertwined in a way that define each other (Stoopendaal and van de Bovenkamp 2015). Therefore, we attempt to present the interaction between policy and regulation with clinical governance.

Clinical governance policies are essential so that there is an improvement in health care quality (Gauld and Horsburgh 2020). Consequently, most of the studies in this section focus on how regulation and clinical governance interaction aims to support quality and safety of patients (Waring et al. 2016; Stoopendaal and van de Bovenkamp 2015; Waring et al. 2016; Tenbensen et al. 2021).

A way to develop a “good governance”, it is to study what it means good governance for various environments (Stoopendaal and van de Bovenkamp 2015). For instance, United Kingdom in 2012 enacts a regulation regarding medical revalidation under whom doctors should prove their clinical capacity and adequacy, while at the same time demonstrate managerial service to their respective organizations. This regulation seems to lead to better clinical governance and professional and organizational accountability (Price et al. 2020). In the same vein of accountability and value-based performance management, Canada’s initiative of 2015 enacts control rooms that represent a comprehensive value-based tool that integrates the various dimensions of health system performance that is patient experience, care team well-being, population health and cost reduction (Côté-Boileau et al. 2021). These control rooms lead to improved capacities within healthcare organizations. In 2010, Australia passes a health workforce regulation requires the National Boards to establish detailed standards for the registration of health practitioners in accordance with the legislative framework (Pacey et al. 2017). Further, regarding complaints the examination process portrays co-regulatory characteristics as the examination takes place at a national level (Pacey et al. 2017).

Also, a fundamental analysis of key definitions of clinical and health governance is of the essence so that we could be able to measure and regulate it (Lipunga et al. 2019). This fundamental knowledge seems to be absent.

Ultimately, regarding the effect of regulatory initiatives on clinical governance it seems that transition policies from New Public Management to New Public Governance cannot be achieved without the agreement of all actors participating in health system (Van De Bovenkamp et al. 2014). Particularly, in 2016 New Zealand implements a transition plan to New Public Governance by asking public and private health organizations to develop improvement indicators of health system and plans that will transform the delivery of health services. The transition to New Public Management attempted at a local and a national level. At a local level there are two main principles that is the improvement of quality on processes that revolve around data collection and sharing, diagnosis of service gaps between local providers as well as the integration of health services. At a national level, there are health policies that refer to development of performance measures on behalf of government and funding rewards based on target achievements (Tenbensen et al. 2021). Initially, this transition attempted in a smooth way where New Public Governance complements the existent New Public Management, but it failed. After this failure, there was an unofficial motivation to organizations that they should replace performance improvement over quality improvement. This way was a far more efficient way to transform to New Public Governance (Tenbensen et al. 2021). However, this conclusion that a gradual implementation of New Public Governance on behalf of public policy cannot be achieved contradicts Van De Bovenkamp et al. (2014) that mention that institutional changes should take place progressively.

Also, purely drafted policies may lead to uncertainties regarding their capacity to serve their goals. In Belgium, the reform regarding mental health care delivery it is unclear how the new policy could achieve its goals (Nicaise et al. 2014). Moreover, most of the time the existence of a regulatory framework is not sufficient as there must be exogenous pressures to force to improvements regarding the quality of governance (Van De Bovenkamp et al. 2014). Further, those pressures need to be focused to be efficient. For instance, it is not enough to set quality indicators just for the sake of accountability and if those indicators actually work and lead to improvements in quality then this is due to greater commitment on behalf of health personnel (Van De Bovenkamp et al. 2014).

Focusing on the issues that may prevent the quality improvement of health governance we feel the urge to put the connections between different actors into perspective. Particularly, according to the literature, healthcare systems are built upon agency relationships among users of health services (patients), providers (doctors) and third-party payers. The government’s role is restricted to that of financing healthcare and providing services (meaning it takes on the

responsibilities of the third-party payer and provider respectively). Despite the fundamental role of the government, the ability to monitor patients, doctors and other players is limited to a medical council or guidelines regarding the appropriate use of pharmaceuticals and technology (Bali and Ramesh2017).

Consequently, health governance quality improvement policies and policies of inclusion and universal health coverage should be built upon cooperation between stakeholders (Van De Bovenkamp et al. 2014; Pacey et al. 2017; Tenbensen et al. 2021), accountability and quality systems in place (Côté-Boileau et al. 2021; Bali and Ramesh2017; Tenbensen et al. 2021), deep knowledge of health governance and clear policy initiatives (Lipunga et al. 2019; Nicaise et al. 2014; Bali and Ramesh 2017). Moreover, it is important to keep an eye on what others may do better than you that could give you a better perspective on “good governance” (Stoopendaal and van de Bovenkamp 2015), but mere “copy-paste” of foreign policies on health governance without taking into consideration institutional and other factors as well as fiscal capacities will be inefficient on the long term (Bali and Ramesh2017).

3.2.3.2 Health Privatization and Corporatization

Literature in this section examines how privatization interacts with health governance. First, corporatization is to be distinguished from privatization as the former involves publicly owned corporations, the latter involves privately owned ones. However, both reflect the situation where state distances itself from the control of the entity. This transition of state-owned enterprises into semi-autonomous, legally independent entities, has become popular worldwide since the 1980s (Turner and Wright2022).

Many factors led to the autonomy of state-owned enterprises. First, there is the transition from traditional public management to New Public Management, that suggests that corporatization falls into the premise of public service improvement that turns away from the state and toward the market as a model for transforming service delivery (Turner and Wright 2022). Second, in the context of healthcare, there is a huge funding gap of 2,5 trillion dollars that public finance is not sufficient to cover so that the target of universal of healthcare coverage to be achieved. Therefore, the need for private capital is of the essence (Hunter and Murray2019). Specifically, the years to 2006, half billion dollars have been committed to development financial institutions for private health providers in form of loans or investments. This amount has been more than doubled in the period 2007 to 2015 (Hunter and Murray 2019). Another factor besides financial incapacity of state is the lack of infrastructure and personnel in healthcare (Hunter and Murray 2019; Rahman 2020). Third, besides financial constraints of public sector regarding healthcare, there seems that a general inefficiency of public governance be translated into health governance inefficiency like low quality of services (Rahman2020).

How this transition from public to private takes place? Commercialization in healthcare takes place through public-private partnerships and policies that emphasize the creation of health market which ultimately lead to the creation of health system that patients pay to access hospital care (Hunter and Murray 2019; Rahman2020).

Inevitably, an ideological conflict bursts between the capitalism and socialism supremacists, on how beneficial is the marketization of health.

First, corporatization leads to changes regarding corporate governance philosophy in organizational level (Turner and Wright2022). Transitioning to a more market like model, corporate governance focuses on the direction and control of the new organization (Turner and Wright 2022). Regarding medical work it becomes monitored by managers and commodified and doctors are not familiar with their dominance being threatened (Turner and Wright 2022; Hunter and Murray 2019). For instance, healthcare professionals in corporately owned hospitals, are incentivized to over-test, over-diagnosis and unnecessary treatments to increase revenue (Hunter and Murray 2019). Also, public accountability seems to be more weakened as funding process becomes less open to public scrutiny (Turner and Wright 2022).

Second, at a government level the transition from communism (government) to capitalism (governance), which commences at the late 1970s leads to the pathologies of regulatory governance (Jones and Hameiri 2021). Specifically, according to Jones and Hameiri (2021), despite being advertised as the epitome of efficiency, the shift from communism (government) to capitalism (governance) followed by significant pathologies, which the COVID-19 pandemic brought to the surface. The fragmentation of power and responsibilities leads to increased bureaucracy (Jones and Hameiri 2021). Moreover, even though there is an abundance of organizations and metrics locally and globally that govern health, their efficiency is questioned considering that ranking systems and assessments are based on rather on the bureaucratic documentation of health governance capacities and not the actual performance and output (Jones and Hameiri 2021).

Implications of commercialization of healthcare to society are health risks where unnecessary medical actions may lead to infections, cardiovascular problems, and others (Hunter and Murray 2019). Moreover, this situation may adversely impair the trust of patients to the ability of healthcare system to meet their needs (Fotaki2014). Particularly, monetary incentives alter doctors' behavior something that affects patients' trust as they realize the tradeoffs that occur (Fotaki 2014). Therefore, despite the theoretical approach that the free choice of patient increases legitimacy observations from

Europe, UK and other, reveal that transition to free market may lead to decreased trust in health systems (Fotaki 2014). Also, there seems to become normalized the segmentation of healthcare systems as population groups and geographic areas that are unprofitable could be neglected from the free market (Hunter and Murray 2019).

Evidence from emerging economies may support that it is crucial for hospitals to have an effective administration and governance, as a hospital's legal form may have no influence on its financial performance (Pirozek et al. 2015)

Nevertheless, the solution lies somewhere between the two opposites. When government follows an expansion policy and finances health for poor households should simultaneously enact constraint policies in the domain of health services delivery. In this way, policy makers are better able to balance between expansive policies and excess health expenditure (Liu et al. 2021).

Summarizing, health privatization is unavoidable since there are fiscal and other limits of public sector. However, policy makers need to take into consideration the complexity of the problems they try to solve trying to achieve quality health governance and universal healthcare coverage which is the Sustainable Development Goal 3.

3.2.3.3 Board Diversity/Board Characteristics

There is a significant interest on how board diversity provides added value to the firm and society (Koutoupis et al. 2022).

In the context of health, board diversity has been studied through research and development and marketing (Tsui et al. 2022), financial performance (Ellwood and Garcia-Lacalle 2015), patient experience (Veronesi et al. 2015; Mannion et al. 2015), fees (Ellwood and Garcia-Lacalle 2016) and woman presence in healthcare (Kalaitzi et al. 2017; Leung et al. 2020). Also, literature examines board characteristics in conjunction with clinical governance (Prentestini et al. 2015) and hospital accountability (Bakalikwira et al. 2017; Freeman et al. 2016).

To begin with, boards that have CEO and board president of the same gender are more effective than simply having more women on board (Tsui et al. 2022). In the same vein, Ellwood and Garcia-Lacalle (2015) examine National Health Service Foundation Trusts and find that there is not significant difference in financial returns or service quality either having high or low presence among executive and non-executive directorships. However, female Chairs or female Chief Executives could contribute to lower negative social outcomes, such as lower clinical negligence costs, without harming financial management.

Regarding patient experience, it seems that members of the board with clinical background, could significantly improve the patient experience. Particularly, in line with critical mass theory, the findings of Veronesi et al. (2015) also suggest that after a certain threshold clinicians' representation on boards could exert its positive effects.

The bigger the size of the audit committee, the greater the probability of diversity in those audit committees and therefore the greater the demands for the external assurer that ultimately leads to higher audit fees (Ellwood and Garcia-Lacalle 2016)

When it comes to woman's presence in healthcare industry in general it seems that they have quite a few obstacles to face as women leaders in healthcare remain absent from top management, even though they are traditionally occupied in numbers in healthcare industry (Kalaitzi et al. 2017; Ellwood and Garcia-Lacalle 2015). Factors that hold back women could be the multiple roles of women as housewives, doctors and managers that could lead to work overload. Also, stereotypes that have to do with gender could constrain women from asserting top management seats. (Kalaitzi et al. 2017). However, if those barriers remain, then the opportunity cost to the society increases as women turn out to be valuable assets during COVID19, with the women in power exerting strong positive effects on public health expenditure, that in turn it is translated to a significant impact on the number of diagnosed and critical cases (Leung et al. 2020).

Board culture is also important when it comes to clinical governance. Specifically, it seems that organizations with a culture focused on the external environment present a more positive attitude on clinical governance (Prentestini et al. 2015). Therefore, considering the leadership that encourages rational and developmental cultures is crucial when appointing top managers (Prentestini et al. 2015).

Hospital accountability seems to be positively correlated with managerial competencies, while board governance is not significantly correlated with accountability of government hospitals (Bakalikwira et al. 2017). Regarding accountability that refers to patients' safety, organizational process is of paramount importance for board of directors to impute responsibilities to executives (Freeman et al. 2016).

From the above we conclude the following. First, most studies regarding the board characteristics employ a sample from English National Health Services. This is probably the subsequent of superior reporting of each and every actor in the health system of England. Second, regarding board diversity of public health organizations it is evident that women and clinicians as directors add value to the cause these organizations serve (Leung et al. 2020; Veronesi et al. 2015; Tsui et al. 2022).

In particular, as women traditionally are occupied in healthcare (Kalaitzi et al. 2017; Ellwood and Garcia-Lacalle 2015), the proportion of female directors in executive directorships is higher than the proportion of female directors serve in nonexecutive directorships (Ellwood and Garcia-Lacalle 2015).

Nevertheless, we should keep in mind that the greater the size of the board, the higher transaction costs, informational asymmetry and communication struggles that probably outweigh the increased monitor capacity (Mannion et al. 2015). Third, it is evident that the board of healthcare organizations needs further clinical training (Mannion et al. 2015), as stakeholders scrutinize issues related with service performance and not just financial related issues (Ellwood and Garcia-Lacalle 2016). This accountability on quality of health services needs to be facilitated through organizational processes (Freeman et al. 2016). Ultimately, even though reporting of non-financial matters has improved, organizations still fail to report critical details that will enable researchers to further the knowledge of board characteristics and organizational performance. For instance, regarding health and safety of patients what is the proportion of board members that go through relative training? What is the percentage of time that of board meetings that is dedicated to discussion related to health and safety of patients? (Mannion et al. 2015)

3.2.3.4 CSR/Sustainability

Corporate social responsibility (CSR) has been widely studied, but in the concept of health sector this theme is underdeveloped. By its nature health sector could be viewed socially responsible (Russo 2016). Moreover, sustainable healthcare refers to an umbrella term for activities that vary from adapting the service delivery model to reducing waste (Johansen et al. 2018)

Russo (2016) suggests CSR in health as the social responsibility of health organizations to do their job. This means that it must be organized well (clinical and organizational appropriateness). Also, this translates to be responsible for their social impact which refers to acting as community member and not merely taking into consideration stakeholders. Consequently, clinical governance is an essential substance of good corporate governance where doctors' autonomy is prerequisite to do their job and therefore the whole organization being socially responsible. From a quantitative perspective, the UN SDGs agenda for universal access and well-being could be employed to assess sustainability-related performance (Rattan et al. 2022). Specifically, an index of three pillars (economic, social and environmental) could be used with performance reporting and budgeting, waiting time and urban and rural disparities refer to the economic pillar, while equal access and environmental considerations with regards to production and natural medicines refer to the social and environmental pillar respectively (Rattan et al. 2022).

Further, one of the pillars of sustainability refers to the employees' satisfaction in a firm as they are one of the main stakeholders. Healthcare is no different and employee engagement seems to positively affect employee performance, meaning that a well-trained employee adds value to the healthcare organization (Sendawula et al. 2018). This seems to hold for quite difficult and extraordinary events such as the COVID19, where workers can still be happy. This sense of euphoria is observed to be higher in comparison with other crises (Minguela-Recover et al. 2022). Further, during COVID19 the impact on CSR is unknown, however many companies have been reported as accusations of not taking seriously the health risks to workers and customers brought to the surface (Levy 2021). Moreover, green hiring activities seem to positively affect economic, environmental and sustainability performance (Mousa and Othman 2020).

Literature on healthcare identifies four main dimensions that portray the opposite of sustainability that is unsustainability. The first one refers to affordability and accessibility to health care as demand rises (ageing populations, increase in chronic disease and possibilities of medical technologies). The second one refers to the dehumanization of healthcare and focus on financial performance. The rest ones are the environmental impact of healthcare design and institutions on the environment and climate change impact on health (Johansen et al. 2018). In this sense, Belgium in 2012 commences effort to transition to sustainable healthcare. The results from training top managers and directors sustainability principles based on ISO 26000 could be summarized as inspiration, awareness and internal engagement, knowledge and perspective and shared conversation (Johansen et al. 2018).

In emerging economies also known as Bottom of the Pyramid, social enterprises, that is a type of hybrid organization that combine aspects of charity and business, have significantly contributed to the exploitation of the business opportunities that lay behind institutional voids. By doing good, they could cover this institutional void and create new markets (Agarwal et al. 2018). In the concept of healthcare for instance social enterprises enhance employability through education provided in cooperation with formal institutions relative to their operations such as basic paramedic skills training. Moreover, informational and educational campaigns about healthcare have created new customers (Agarwal et al. 2018). In other words, healthcare organizations in emerging markets that are social conscious (health awareness campaigns, low-cost services through government cooperation, support, and education of local populations) besides from gaining legitimacy they are able to create new markets and increase their revenue.

Even though CSR activities seem to provide added value to the firm, empirical observations that employ CSR scores and

financial performance accounts do not provide any support of this argument (Kuzey et al. 2021). Moreover, it seems that CSR committees do not add value as when an interaction term is employed in the model between CSR committees and CSR performance, it is statistically insignificant (Kuzey et al. 2021). This could be justified by barriers regarding the adoption of environmental strategies like the passivity on environmental matters and the difficulties in quantifying the impact of environmental practices (Pinzone et al. 2015).

From the above we conclude the following. First, there is a growing pressure from stakeholders that healthcare organizations deliver high quality services with positive effects on the society and the environment (Pinzone et al. 2015; Mousa and Othman 2020) and as long as healthcare systems are facing tenacious challenges, such as ageing population and increases in chronic diseases and healthcare costs, facilitating transition to a more sustainable healthcare is of paramount importance (Johansen et al. 2018). Second, literature suggests that sustainability practices even though seem to some extent exhibit beneficiary effects for society and the environment, they are not fully implemented for various reasons such as ignorance (Johansen et al. 2018), difficulties in quantifying those actions and their impact (Pinzone et al. 2015), lack of commitment (Pinzone et al. 2015; Mousa and Othman 2020) and focus on providing medical services (Mousa and Othman 2020) rather than taking environmental actions (Mousa and Othman 2020). However, social impact can create new markets that by doing good deeds could bring additional revenue and resources to healthcare organizations (Agarwal et al. 2018). Increasing employability by providing medical training and increasing health awareness through campaigns contribute to the situation where healthcare organizations gain legitimacy and resources in terms of employees and increased revenues (Agarwal et al. 2018). Specifically, engaging health workers are happy workers that can add value to the organization (Sendawula et al. 2018; Minguela-Recover et al. 2022).

Consequently, training initiatives that revolve around all the aspects of sustainability (economic, social and environmental) will provide knowledge that will motivate health organizations to realize the value relevance of these concepts (Johansen et al. 2018; Mousa and Othman 2020). Moreover, on the job training should always be top priority (Sendawula et al. 2018).

3.2.3.5 Risk Management

Research in risk management, refers to different kind of risks and their management by health organizations. There is the governance of family firms in health care (Cobben et al. 2022), the reputational risk in social media (Chaudhri et al. 2021), climate risk and pandemics (Phipps 2020; Sharma et al. 2021), risk management frameworks and common risks in healthcare (Martin et al. 2015; Wilson 2022; Koutoupis et al. 2022; Joshua and Washington (2019).

To begin with, family firms in healthcare employ different forms of governance mechanisms (formal and informal) to mitigate relational and performance risks, while the perception on risks over time leads to trade off between formal and informal mechanisms of governance (Cobben et al. 2022).

Risk nowadays is highly concentrated on social media. Particularly, as social media scrutiny is strong, doctors could expose themselves and their organization to reputational risk. Particularly, the control over social media usage decreases as it challenges the employee alignment with the goals of the organization. This manifests through the complaints of the employees on social media. It is also very difficult in a huge organization with many employees each and every one of them to be in line with the organizational goals. Also, even though an organization decides to enact social media policies then too many of them will cause people to stop expressing themselves (Chaudhri et al. 2021). With regards the accessibility dimension, the convenience that characterizes social media could lead to an employee to cross boundaries and reveal personal information. Also, the immediate responsiveness of social media could create a culture that distracts from organizational goals and force employees to work faster (Chaudhri et al. 2021). All this in a time that patients' complains have increased as patients become more informed and a negative publicity could blemish medical profession (Chaudhri et al. 2021).

We have previously represented how CSR/Sustainability initiatives could interact within healthcare organizations. But what are the risks outside the strict microenvironment of the health organization and society in general? Phipps (2020) suggests that temperature increase that climate change effectuates pose direct threat to public health. Also, climate change combined with political instability-risk (such as wars and others) leads to immigration which puts strain on the health system of the countries that accept those immigrants. Further, climate change may lead to new illnesses such as COVID19 that creates higher health risk to vulnerable groups of the population (elders, children and other). A way to prepare for such disastrous phenomena is to study and learn from past experiences (Sharmaetal2021).

A quite simple risk management strategy that could be applied in the microenvironment of health organizations is the use of patients' complaints (soft data) simultaneously with other hard data metrics such as infection and complication ratios (Martin et al. 2015). This could lead to improved health outcomes and safety for patients. Further, there are signs preceding disasters that usually are ignored or miscalculated but usually it is the tendency in a health organization to prevail a culture of secrecy, denial and segmentation of knowledge and responsibilities for their encounter (Martin et al.

2015; Wilson 2022). This environment makes staff and patients more likely to feel that are powerless to provide warnings (Wilson 2022). Consequently, future disasters could be avoided when hospitals are more eager to hear stakeholders (patients, personnel and others), like patients' complains (Martin et al. 2015). Also, poor financial control and deficits are among the most prominent markers of a healthcare organization in demise (Wilson 2022).

From the above we conclude the following. First, human engagement is imperative for efficient risk management (Wilson 2022; Martin et al. 2015), however personnel and healthcare organizations should keep in mind that stakeholders' engagement poses its own risk after a certain threshold (Chaudhri et al. 2021). In addition, learning from the past and having plans and risk management frameworks in place is crucial for effective risk recognition and mitigation (Wilson 2022; Sharma et al. 2021). Particularly, employing public archives that are available regarding the most recurring risks in the governance of healthcare organizations as well as financial performance metrics (Wilson 2022) is a relatively easy way to learn from competitors and the past. Ultimately, health organizations in mind the big picture of universal challenges that is climate change that affects clinical governance long term (Phipps2020; Sharma et al. 2021).

3.2.3.6 Healthcare Governance Quality/Assessment Models

Literature in this subsection employs models that could be applied in healthcare organizations that measure and promote efficiency.

Favaretti et al. (2015), employ the (EFQM) Excellence Model to assess the integration and quality of performance and governance of an Italian healthcare trust. Regarding the model itself, it is based on eight fundamental excellence concepts and nine dimensions. A number of thirty-two sub criteria is contained in each criterion. The results suggest a significant improvement of the organization on customer satisfaction and key service delivery and outcomes.

A relatively recent emerging research field tries to explore Lean in healthcare. Lean focuses on analyzing workflow to reduce cycle time and eliminate waste, striving to maximize value to the customer while wasting the minimum amount of assets. Six Sigma targets perfection through the cost elimination and achievement of higher levels of customer satisfaction. Lean is a well-known manufacturing approach (Hallam and Contreras2018; Bhat et al. 2019). Specifically, in the healthcare concept Lean tries to cure issues of efficiency and patient satisfaction (Hallam and Contreras 2018). It seems that, patients' waiting time is incremental (Hallam and Contreras 2018; Bhat et al. 2019), as patients consider long waiting hours to be detrimental for their health, which can be significantly reduced by dealing with the cycle time of the system (Bhat et al. 2019). Moreover, effective clinical governance such as effective leadership and communication, data availability and involvement of cross-functional team are critical so that Lean Sigma Six to be successful (Bhat et al. 2019). The above seems to be verified by the literature review of Hallam and Contreras (2018), on Lean management in health care, as it seems that Lean can improve healthcare operational effectiveness through common methods employed in healthcare (statistical and others). Nevertheless, empirical studies show a narrow real-life practice with a relatively low success. In most cases, Lean has been applied through a limited employment of the relative tools that mainly focus on patient waiting times and it is still inconclusive whether it is efficient long term (Hallam and Contreras 2018). Overall, Lean practices in health increase efficiency through reduction of waiting hours and hospitalization (Hallam and Contreras 2018).

A more hard data approach is that of Nuti et al. (2017) which is applied in Italian local health authorities. Particularly, they follow a framework of 200 performance indicators in two stages. The first stage is that where from 200 indicators are selected only those who are accurate and available. Then for each indicator the region benchmark, the trend and the variance are defined. Consequently, the indicators that present greater variance from the benchmark are those in which management needs to make priority for further improvement.

Mosadeghrad (2015) employs a total quality management survey model to assess the Iranian healthcare organizations on different factors of total quality management such as leadership, strategic quality planning, education and training, resource management and others. The results suggest a medium level of successful total quality management of health care organizations, while employee, information and costume management present the most positive effect on total quality management success.

Further, McCarthy et al. (2016) suggest a model that takes into consideration the improvement of performance, the regulatory restrictions and patient's experience, as healthcare sector operates in a highly regulated environment. Those regulatory restrictions for example that revolve around patients' personal information could pose another obstacle for health care process (McCarthy et al. 2016; Ryyänen and Harisalo2018) and patients most often than usual complain about those difficulties (Ryyänen and Harisalo 2018). Through their complaints that revolve around care, patients hoped that their complaints would be taken seriously, to further have a positive impact on the organization's operations (Ryyänen and Harisalo 2018). In the same vein, more and more studies suggest that working groups in which patients and doctors have a constructive dialogue could result to an improvement of quality care (Locock et al. 2014; Boaz et al. 2016).

However, despite the inconclusiveness about the contribution of those integrated care models they remain a popular policy goal (Exworthy et al. 2017).

From the above we conclude the following. First, there is the need and challenge for healthcare organizations to use models that assess the integration and quality of performance and governance (Favaretti et al. 2015; Mosadeghrad 2015). Second it is crystal clear that patients and other stakeholders should actively engage to the improvement of perceived quality of healthcare governance (McCarthy et al. 2016; Ryyänen and Harisalo 2018; Locock et al. 2014; Boaz et al. 2016). Patients' engagement ranging from a simple complain (Ryyänen and Harisalo 2018) to a more co-design process (Locock et al. 2014; Boaz et al. 2016) could act as a catalyst for broader change in the attitudes of staff by providing a motivation for wider organizational and attitudinal changes (Boaz et al. 2016; Ryyänen and Harisalo 2018). Nonetheless, despite that citizens' participation in healthcare is a central policy goal for governments and public authorities it is inconclusive and still under examination what really engagement entails which in turn is correlated to ideas that present high variance about the roles citizens could or should play in shaping healthcare (Renedo and Marston 2015). Third, testing governance models that target to efficiency from other industries such as lean management, more rigorous could provide additional tools (Hallam and Contreras 2018; Bhat et al. 2019) to recognize and deal with the main inefficiencies in healthcare such as overproduction (double entry of the same information), waiting time, patient and materials transportation, work overload that leads to stress, excess or missing inventory, unnecessary processes that make staff looking for paperwork and others, and medical errors and unnecessary tests (Hallam and Contreras 2018).

3.2.3.7 Cost Accounting/Financial Performance

Literature in this subsection provides insights on accounting costs in health organizations, the determinants of financial performance in healthcare organizations and the effect of mergers on the governance of healthcare organizations.

da Silva Etges et al. (2019) provide a costing framework that could contribute in health resource evaluation. Also, from the perspective of cost efficiency in healthcare, Moro Visconti (2014), analyzes the factors that should be taken into consideration choosing between a public-private partnership and traditional procurement.

3.2.3.8 Changes in Healthcare Systems

A health system as we previously mentioned, refers to the whole health system, not just the public system (Lipunga et al. 2019).

Wendt (2014) recognizes and describes four types of health systems, clustering 32 Organization for Economic Cooperation and Development (OECD) healthcare systems. Type 1, which includes Central and Eastern Europe countries healthcare systems and are characterized by strict access regulation and control of doctors' income chances through capitation payment. Type 2, healthcare systems combine strict access regulation and control of doctors' income chances with high levels of healthcare provision in the in- and out-patient sectors. In this category Finland, Iceland and Sweden are integrated, as well as Spain and Portugal who also increased their levels of in-patient healthcare. Type 3 is characterized by very low total health expenses and very high out-of-pocket payment, while general practitioners are paid a salary. Finally, type 4 is represented by the highest public finance of health and the lowest direct payments by patients.

Health care sector aims to cure sick people. Conversely, the public health sector aims to protect the general public from illnesses (Trein 2017). The healthcare and the public health sector are intertwined and therefore a coevolution between the two is observed (Trein 2017). In countries where public sector controls regulation and financing of healthcare governance, the two sectors should coevolve toward coordination, integration, and equality whilst in countries where private sector controls the governance of regulation and financing of healthcare, both sectors should be formally separated but informally they keep their equal status quo (Trein 2017).

Further, when it comes to transitioning health coverage from hospitals to primary care, policy makers should look for interprofessional cooperation among health professionals that constitute a team (Allan et al. 2014). Factors that affect the efficiency of those transition policies are organizational commitment, leadership, clarity of goals and coordination of the various specialties of professionals among the team (Allan et al. 2014). In the same vein, human factor is imperative for a successful transition to integrated governance (Barbazza et al. 2015).

Summarizing the above we conclude the following. First, it seems that little research has been conducted on comparing, analyzing and organizing health systems worldwide (Wendt 2014; Trein 2017). This could be attributed to the difficulties such endeavor entails such as for example the quantification of regulation and policy initiatives when analyzing multiple countries (Wendt 2014). An overview of health systems worldwide indicates that countries of Central and East Europe transition their health systems to follow the capitalistic models of Western countries, abandoning the socialistic models (Wendt 2014). Scandinavian countries and United Kingdom test their internal market, while countries of West Europe appear strong competition along with reinforced state intervention (Wendt 2014). Ultimately, United States of America present partially improvement on health coverage (Wendt 2014). Whatever the case may be, competent health workforce

is vital in the changing health landscape (Barbazza et al. 2015).

3.2.3.9 Cyber Security/Digital Transformation

Literature in this subsection revolves around cyber security and digital transformation in health.

Healthcare sector undergoes an essential and expensive digital transformation development (Garcia-Perez et al. 2022; Burton-Jones et al. 2020).

An effective and systematic approach of the cyber security that goes hand in hand with the adoption of the latest technologies and their applications in the healthcare systems is of the essence (Garcia-Perez et al. 2022; Abraham et al. 2019). However, we have yet to realize the way to form the strategic vision of a robust and long term digital transition of the healthcare sector (Garcia-Perez et al. 2022; Abraham et al. 2019; Burton-Jones et al. 2020). This could be attributed to the limited research (Burton-Jones et al. 2020) and practical knowledge among others (Abraham et al. 2019).

Garcia-Perez et al. (2022) suggests that healthcare sector presents systematic characteristics that pose a matter of life and death the development of cyber security knowledge and uncertainty management. In spite of the above, it is observed a superficial approach on cyber security that could be the result of various factors such as the evolution of health technology that come with the relative vulnerabilities, the plethora of security guidance frameworks and standards, the vastness of legal framework, the absence of a capable information technology (IT) function and total unawareness of top management executives of cybersecurity risk tolerance level as well as cybersecurity threats and defense mechanisms (Abraham et al. 2019). Ultimately, the institutional environment seems to exert a significant effect on the understanding of the evaluation of the whole digital transition in the healthcare sector (Burton-Jones et al. 2020).

From the above we conclude the following. First, as digital transformation of the healthcare sector is inevitable (Garcia-Perez et al. 2022; Abraham et al. 2019), cybersecurity is a global necessity that will concern market and science long term (Abraham et al. 2019). Particularly, superficial approaches on digital transformation in the health sector and consequently on cyber security could potentially pose life threatening situations as for instance any medical equipment with internet access could be a potential target for hackers (Abraham et al. 2019). Despite the severance of this reality, health organizations' management and policymakers seem to be unprepared (Garcia-Perez et al. 2022; Abraham et al. 2019). From the regulation standpoint oversight bodies could commence audits of healthcare organizations' digital capacities regarding their absorption, adaptation and transformation (Garcia-Perez et al. 2022). Healthcare organizations could integrate cyber security into the management strategy (Garcia-Perez et al. 2022; Abraham et al. 2019) through the comprehension of cybersecurity risks, valuing cybersecurity risks and mitigation measures and communication of cybersecurity initiatives and solutions (Abraham et al. 2019)

3.2.3.10 Human Resources Innovation

In this subsection we present literature that analyzes human resources and proposes innovative solutions on how health organizations could combine talents in the executive line of the organization.

As health organizations such as hospitals, face major challenges (ageing population, competition to attract human capital, government financial constraints), there seems to be the need to raise competition as well as cooperation with each other at the same time (coopetition) (Van den Broek et al. 2018). Specifically, this concept is relevant for the human resources as a joint Talent Management Pool could be developed between hospitals (Van den Broek et al. 2018).

Statistical analysis on employee-related issues is indicative of the innovation that is concentrated on human resources (Van den Broek et al. 2018).

A main concern on healthcare human resources is the perception of clinical professionals about their profession. Professionalism on behalf of doctors has been thoroughly studied (Moffatt et al. 2014; Byrkjeflot and Jespersen 2014). Traditionally, professions were commonly perceived as self-governing, with social control of the professional achieved through traditional informal rules and pressure around the professional. This perspective supports the creative and discretionary mindset of the professional.

However, recently the accuracy of the notion of social control became increasingly questioned, with professions often being seen as self-serving and unreasonably monitored (Moffatt et al. 2014). Specifically, professionals themselves seem to care mostly about their interests and how to monopolize their profession. In this sense national health systems like the one of United Kingdom that follow the model that try to control professionals failed to engage professionals, therefore a new professionalism is promoted in which productivity is recognized as an individualized professional duty (Moffatt et al. 2014). Moreover, this conflict between traditional self-governance and the emerging concept of management, gives birth to three hybrid management models (Byrkjeflot and Jespersen 2014). The first model proposes a manager that is also a clinician that has not entirely stopped practice medicine, the second model proposes managers with professional history in healthcare and the third model proposes a manager who is less autonomous manager that simply complies to regulators

(Byrkjeflot and Jespersen 2014). It seems that the logic of hybrid management protects the self-governance of the profession while at the same time embraces reforms towards more efficiency, accountability, and quality of services (Byrkjeflot and Jespersen 2014).

The superiority of managers with clinical background seems to be supportive by the literature (de Harlez and Malagueno 2016; Spehar et al. 2015; Spurgeon et al. 2015; Burgess et al. 2015; O'Meara et al. 2018; O'Meara et al. 2017; Tasi et al. 2019). de Harlez and Malagueno (2016) suggest that it is the top-level managers' personal background that enables a delicate balance between the usage of performance measurement systems and strategic priorities (supervising productivity and costs of the hospital, research and training of personnel, patients' care, partnerships between hospitals, accountability) in hospitals. In the same vein, it seems that effective medical leadership underpins the effective organizational performance (Spurgeon et al. 2015; Tasi et al. 2019).

Besides physicians, paramedic personnel in crucial clinical roles could also contribute to better quality and safety outcomes (O'Meara et al. 2017). Paramedic services are categorized to the French-German model which is mainly manned by medical personnel and the Anglo-American model, that uses paramedic personnel for ambulances' crew (O'Meara et al. 2018). There is no evidence that Anglo-American model performs better than the French-German model (O'Meara et al. 2017; O'Meara et al. 2018).

From the above we conclude the following. Hybrid management models that employ clinicians in top management positions provide superior performance (O'Meara et al. 2017; O'Meara et al. 2018; Spurgeon et al. 2015; Tasi et al. 2019; de Harlez and Malagueno 2016).

3.2.3.11 Governance of Innovation

So far we observe that stakeholders become more and more involved in the healthcare, thus having a say on the formulation of their own well-being (Secundo et al. 2018; Dobrzykowski et al. 2015; Proksch et al. 2019).

Specifically, the wide range of stakeholders cooperate to facilitate scientific knowledge or to develop novel services, solutions, and prototypes (Secundo et al. 2018).

In healthcare ecosystems, innovation refers to the upgrades and not the formation of a singular product or service (Secundo et al. 2018). Actors of healthcare ecosystem view innovation as an effective way to improve hospital performance expressed through patient satisfaction (Dobrzykowski et al. 2015; Proksch et al. 2019).

Governance of health innovation is defined as all those mechanisms that facilitate coordination and regulation of those interactions that lead to the production of new knowledge (McKelvey et al. 2018).

Healthcare ecosystem components (large firms, SMEs, universities, doctors, nurses, patients and others), exploration and exploitation stages (research and development) and the knowledge exchange among the ecosystem players during the phase of research and development (valuable knowledge contributions) are the critical factors that shape knowledge transfer in the concept of open innovation in healthcare (Secundo et al. 2018).

Every human development is motivated by different factors (Secundo et al. 2018). For instance, industry looks forward to increasing its profits by developing and distributing new products in the market. University hospitals on the other hand wish to improve their research activities therefore their output is to develop prototypes and technologies. Government by targeting to more cost-efficient policies they deliver low-cost products and services (Secundo et al. 2018). However, innovation itself does not always lead to improved performance as there is the involvement of many stakeholders that circle hospitals. If those stakeholders do not cooperate properly the results will lead to the opposite direction (Dobrzykowski et al. 2015). Specifically, it seems that hospitals that orient to innovation are better positioned to satisfy patient through key operational practices however the size of a hospital (number of beds) and the status of a teaching hospital does not contribute to the transformation of innovation to patient satisfaction (Dobrzykowski et al. 2015).

Nevertheless, governance of health innovation from a public policy perspective is complicated that could be attributed to the plethora of governance mechanisms managed by different stakeholders and focusing on different aspects of the process (McKelvey et al. 2018).

Ultimately, socio-tech ventures are entrepreneurial firms that their purpose is to create social value (Scillitoe et al. 2018). Scillitoe et al. (2018), analyze the technological innovation factors that affect the strategic orientation of socio-tech ventures by using case studies from health industry. These factors are the founders of socio-tech ventures (tenure, pro-innovation stance), innovation (complexity, trialability), organization (legal structure) and external environment (social network).

From the above we conclude the following. First, end-users, patients, policy makers, industries and academic institutions need to cooperate to advance scientific knowledge or to develop new services, solutions, and prototypes (Secundo et al. 2018; Dobrzykowski et al. 2015; Proksch et al. 2019). Second, more research needs to be done considering healthcare

ecosystem (Secundo et al. 2018; Proksch et al. 2019). Further, innovation in healthcare could conditionally (Dobrzykowski et al. 2015) lead to improved performance (Proksch et al. 2019; Dobrzykowski et al. 2015). Innovation in healthcare usually refers to improvements of product or services (Secundo et al. 2018) and it includes new pharmaceutical products that reduce the complication and mortality risks, mobile apps that help to manage patient cardiovascular diseases, processes that target the reduction of unnecessary hospitalization and medical devices that lead to more accurate diagnoses (Proksch et al. 2019). From the perspective of private organizations in health care ecosystem, balancing between their social, market and technology strategic orientation could be challenging (Scillitoe et al. 2018). Ultimately, the importance of innovation in healthcare has increased within the last decades as challenges, like rising costs and an aging demographic, have to be solved (Proksch et al. 2019), although the adoption and standardization of innovation in healthcare are likely to be delayed (Baird et al. 2014).

3.3.1 Potential for Future Research

We provide proposals for future endeavors. First, papers that employ a worldwide sample of countries are essential. Second, regarding the state of development, most studies should analyze emerging economies. Particularly, our observation suggests that countries like Greece, South Africa and others need more research attention. However, it seems that clinical governance is mostly studied in United States of America, United Kingdom and other developed countries.

Moreover, we observe that many studies examine the interaction between clinical governance and regulation-public policy. Furthermore, more research could be conducted on the interaction between clinical governance and board diversity (executives at the ceiling of the health ecosystem), as well as the interaction between different aspects of clinical governance and human resources (personnel and professions in the health ecosystem). Further, more research needs to be conducted in cyber security.

Table II also portrays the narrow range of methods employed that is case studies, essays and interviews.

Literature proposes that future research should employ more quantitative and mixed methods approaches, on investigating clinical governance. Further lending methodologies from other industries such as Lean management could be another fruitful avenue of research (Fournier and Jobin 2018; Hallam and Contreras 2018; Bhat et al. 2019). Another interesting proposal is to examine whether medical revalidation and administrative tenure of doctors improve outcomes for patients (Price et al. 2020) (See Table III).

Table III. Potential for future research

Study	Future Research	ABS Rank
Tsui et al. (2022)	Impact of the length and optimal CEO tenure on performance.	3
Kuzey et al. (2021)	CSR performance effect on firm performance.	2
Banerjee et al. (2017)	Women careers that determine the most health outcomes	1
Moro Visconti (2014)	Interdisciplinary research	2
McDermott et al. (2015)	Regulatory hybridity is sustainable long term	4
Price et al. (2020)	Effects of medical revalidation and administrative responsibilities of doctors on patient outcomes. Organizational and cultural factors that affect of medical revalidation and administrative responsibilities of doctors.	2

Wanke et al. (2022)	Research on whether is feasible to improve our health today without harming the health of future generations.	2
Bhat et al. (2019), Hallam and Contreras (2018)	More research on Lean management in healthcare	2
Fournier and Jobin (2018)	More research on Lean management in healthcare	2
Hallam and Contreras (2018)	More research on Lean management in healthcare	1
da Silva Etges et al. (2019)	Detailed frameworks that promote advances in technology innovation.	2
Garcia-Perez et al. (2022)	Research on digital resilience and digital transformation.	3
Scillitoe et al. (2018)	Develop a theoretical framework that explains the necessary balance between the contradictory aspects of socio tech ventures.	2
Rattan et al. (2022)	Expand the present model by including more dimensions depending upon the nature and structure of healthcare in the jurisdiction of interest or to meet the policy requirements of specific locations.	2
Trein (2017)	How of institutional coevolution affects policy capacity	4
Levy (2021)	Governance that ensures resiliency of societies and economies in the advent of extraordinary events	4
Agarwal et al. (2018)	Mixed method approach that incorporates both qualitative and quantitative methods. Multiple country emerging economies	3

	research and countries suffered from political conflict, war and poverty.	
Secundo et al. (2018)	Multi countries case study analysis.	3
Hunter and Murray (2019)	Research on the financialization that lights the narrative of private finance solutions to public problems	3
Preneestini et al. (2015)	Examine the direction of the relationship of clinical governance and senior management dominant culture.	2
Mannion et al. (2015)	Board characteristics effects on important health system processes, outputs and outcomes	2
Veronesi et al. (2015)	Explore the board-level decision-making and the role of clinicians. Specific impact of different clinical backgrounds (nursing, allied health professionals).	4
Ryynänen and Harisalo (2018)	How patient complaints handling affects organizational strategy.	1
McKelvey et al. (2018)	How policy affects risk-taking behavior and decision-making.	2
Sharma et al. (2021)	More data	3
Lipunga et al.(2019)	Broader sample. Implication of citizen activism in a developing countries' framework.	1

4. Conclusion

Since 2020 pandemic crisis a huge toll on healthcare has been observed. Currently, as macroeconomic environment presents the characteristics of high inflation and slow economic growth it is expected that public expenses that revolve around health to be reduced. Also, as digitalization of healthcare continues at a rapid pace developed countries initiate regulations on the use of the health data that will be the product of this evolution. At the same time, according to World Health Organization and the conclusions of our systematic literature, human societies are far from making a significant process into achieving universal health coverage that is one of the Sustainable Development Goals by 2030.

Our study, conducts a systematic literature review on health and clinical governance to recognize and discuss current trends methodologies and theories revolve around health and clinical governance. Consequently, we contribute to the literature of clinical and health governance by collectively analyzing what has been done and what needs to be done either in terms of public policy or in terms of scientific research.

We present the literature on clinical and health governance published in ABS journals for the period of 2014 to 2022. This leads to a broad, quality sample of research that explores different aspects of health and clinical governance.

Regarding the descriptive statistics of our sampled literature (Table I), our findings suggest that there is interest in single-country studies within a wide range of academic disciplines such as accounting, economics, ethics-csr, social sciences public policy and others.

Regarding the methods, theory and themes (Table II), we conclude that most studies employ qualitative methods such as case studies and essays to examine the different themes of clinical governance. Moreover, we distinguish a wide range of topics that refer to the regulation and policy that revolves around health and clinical governance such as the privatization and corporatization in healthcare, the board characteristics of healthcare organizations and how those interact with different aspects of health organizations, the corporate social responsibility in the concept of healthcare, the risk management, the models and tools employed to assess the performance of healthcare organizations, the cost accounting and financial performance, the changes in health governance systems, the cyber security and digital transformation, the governance of human resources and innovation. Also, theoretical frameworks employed present a high level of diversity in terms of academic discipline origins. Specifically, research employs new management theory that usually explains public policy studies as well as agency theory that is widely established in accounting and finance literature. However, relatively few research puts its findings into theoretical perspectives.

Regarding the potential for future research (Table III), we propose that future research employs a sample of emerging economies. Moreover, we propose the approach of methods that mix qualitative and quantitative tools such as surveys, case studies, regression analysis and others. Future research could also explore models that promote and measure efficiency from other industries such as Lean management (Fournier and Jobin 2018; Hallam and Contreras 2018; Bhat et al. 2019).

To whom it may concern (policymakers, practitioners, researchers, patients and other stakeholders), health governance quality improvement policies and policies of inclusion and universal health coverage should be built upon cooperation between stakeholders (Van De Bovenkamp et al. 2014; Pacey et al. 2017; Tenbensen et al. 2021), accountability and quality systems in place (Côté-Boileau et al. 2021; Bali and Ramesh 2017; Tenbensen et al. 2021), deep knowledge of health governance and clear policy initiatives (Lipunga et al. 2019; Nicaise et al. 2014; Bali and Ramesh 2017). Moreover, it is important to keep an eye on what others may do better than you that could give you a better perspective on “good governance” (Stoopendaal and van de Bovenkamp 2015), but mere “copy-paste” of foreign policies on health governance without taking into consideration institutional and other factors as well as fiscal capacities will be inefficient on the long term (Bali and Ramesh 2017).

Balance seems to be an essential strategy in matters such as health privatization and corporatization (when government follows an expansion policy and finances health for poor households should simultaneously enact constraint policies in the domain of health services delivery), board characteristics (the greater the size of the board, the higher transaction costs, informational asymmetry and communication and decision-making problems that probably outweigh the increased monitor capacity), sustainability (focus on providing medical services as well as taking environmental actions) and governance of innovation (private organizations in health care ecosystem are challenged to meet their social, market and technology strategic orientation). Further, future itself challenges healthcare ecosystem and demands transition and adaptation as ageing population and increases in chronic diseases and healthcare costs posit a more sustainable healthcare a top priority (Johansen et al. 2018). Technology and innovation could facilitate healthcare ecosystem to stand up to those challenges, if taken seriously. Nevertheless, digital transformation is a global phenomenon and ignoring cybersecurity risks could potentially pose life threatening situations as for instance any medical equipment with internet access could be a potential target for hackers (Abraham et al. 2019).

Our study has a number of limitations. First, regarding the time period and the criteria employed to select and organize our sample research. Other studies that do not fall into those criteria could potentially also provide insights in our thematology. Second, regarding our categorization on the themes presented, many studies could be suitable to fall into more than one themes. Moreover, future studies could conduct systematic literature reviews in more concentrated manner. For instance, they could conduct systematic literature review on cyber security and clinical governance that is a very promising field of research. Ultimately, the methodology we followed to conduct this systematic literature review took every measure to mitigate selection bias, even though the intervention of each and every researcher could lead to such bias (Massaro *et al.*, 2016).

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Reviewer Acknowledgements

Review of European Studies wishes to acknowledge the following individuals for their assistance with peer review of manuscripts for this issue. Their help and contributions in maintaining the quality of the journal is greatly appreciated.

Many authors, regardless of whether *Review of European Studies* publishes their work, appreciate the helpful feedback provided by the reviewers.

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