

Management Control Systems and Team Effectiveness: The Intervening Effects of Information Sharing and Organizational Identification

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Abstract

Objective: The objective of this work was to verify the Management Control Systems (MCS's) influence on team effectiveness as moderated by organizational identification and mediated by information sharing.

Method: Qualitative and quantitative research performed via survey, which was administered to 105 professionals at a military hospital located in the center-west region of Brazil, was performed. Structural equation modelling was used for analysis.

Results/Discussion: The results showed that the formal and informal characteristics of MCSs have a positive and significant influence on team effectiveness and that the relationship between the MCS and information sharing is moderated by organizational identification. However, the existence of a significant relationship between MCSs and team effectiveness was not mediated by information sharing.

Contributions: The hospital managers must pay attention to the types of MCS, as they are associated with individuals' attitudes and behaviours, which are reflected in organizational outcomes.

Keywords: Management Control System; Information Sharing; Team Effectiveness; Organizational Identification.

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Introduction

The influence of management control systems (MCS) on the development of organizations and the improvement of their strategies is rooted in Anthony's (1965) research. Following the publication of his work, many theorists sought to provide insights into understanding the role of MCS in organizations (Simons, 1995; Merchant & Van Der Stede, 2017; Malmi & Brown, 2008; Ferreira & Otley, 2009; Kleine & Weissenberger, 2014).

MCS, whether formal or informal (Kleine & Weissenberger, 2014; Goebel & Weissenberger, 2017), represent structures designed to shape employee behaviour and drive organizational performance. Thus, in addition to the mechanistic and bureaucratic aspects that drive the development of organizations, research such as that by Hall (2008) and Hall (2011) prompts researchers to understand the behavioural consequences of MCS.

Understanding the behavioural consequences of MCS includes a plurality of discussion, for example, the impact of MCS on virtual team performance (Piccoli et al., 2004), the use of MCS for organizational integration (Hyvönen et al., 2008), the impact of budget use style on motivation and team effectiveness (Chong & Mahama, 2014), and to analyses the specific reactions of health professionals to MCS (Lopez-Valeiras et al., 2018). This research flow indicates that MCS structural arrangements are capable of contributing to organizational performance, given the interdependence of tasks and the limits set by the organizational scope itself.

This dynamic of understanding MCS as an inducer of interdependent relationship behaviour offers a new way of understanding the role of information sharing in this literature stream (Gurses & Xiao 2006; Ushiro, 2009; Souza & Beuren, 2018). In environments of high interdependence in service collaboration for a shared goal, attainment is a routine action performed through a plurality of mechanisms (Gurses & Xiao, 2006). In this respect, the contemporary flow of literature that involves information sharing is directed at recognizing the results of this action performed by employees in the managerial aspects of organizations (Souza & Beuren, 2018), especially for service providers, such as hospital entities (Ushiro, 2009).

Another literature flow that aligns the theoretical-empirical construction of interest of this research is the organizational identification, as information sharing is closely linked to this process. Thus, Carmeli et al. (2007) highlight that organizational identification can result in cooperative behaviours and organizational citizenship. Similarly, such

organizational identification can result in positive benefits for the individual and the organization (Carmeli et al., 2007; Cavazotte et al., 2017; Santos et al., 2019). When extending these considerations to highly task-dependent environments such as hospitals, there is a need to explore the intervening roles these constructs can play.

In this sense, we pose the following research question: What are the effects of the MCS on team effectiveness and information sharing through the intervention of organizational identification? This study extends existing knowledge by analyzing whether the MCS influences team effectiveness and offers insights into the literature flow that seek to understand the intervening role of organizational identification in the relationship between MCS and information sharing.

Based on a sample of 105 respondents working in a Brazilian Area Military Hospital, the results suggest that the use of MCS impacts team effectiveness. This result illustrates that managers' choices regarding the use of MCS impact team effectiveness, and it is assumed that variation in the MCS structure results in variation in team effectiveness. Furthermore, it is revealed that organizational identification moderates the relationship between MCSs and team effectiveness, a fact that has implications for the development of hospital institutions.

This study is motivated by three interrelated factors. First, it contributes to the literature flow that seeks to understand the relationship among MCSs, team effectiveness, information sharing, and organizational identification. This research evaluates these relationships empirically, providing insights into the hospital environment as it exposes the moldability of the MCS and the consequences it can provide for the organization. It is illustrated that the behaviours that managers desire individuals to assume in the development of interdependent tasks and objectives are closely related to the structure and use of MCSs a fact that is presented as a contribution of this study.

Second, there is limited research examining the connection with accounting in a team context (Chong & Mahama, 2014), which is a theme that has spread in contemporary times. This process is due to the characteristics present in teams, which involve a plurality of experiences that align to make decisions, to achieve results and to contribute to the managerial performance of the organization, as goals and objectives are often linked by teams and the incentives received for reaching the goal are affected by the performance of the entire team.

Third and finally, the study reinforces the theoretical-empirical pillars regarding the roles of team effectiveness (Kathuria & Davis, 2001; Chong & Mahama, 2014), organizational identification (Carmeli et al., 2007; Cavazotte et al., 2017; Santos et al., 2019) and information sharing (Ushiro, 2009). Linking this flow of investigations to the MCS literature is timely as it broadens the understanding of the behavioural consequences of MCSs (Hall, 2008; Hall, 2011).

2. Theoretical Background and Hypotheses Development

Management control systems (MCSs) have been conceptualized and applied from a variety of perspectives. The conceptual basis for any and all contributions comes from Anthony's (1965) research. Subsequently, several other views have been presented by Vandebosch (1999), Malmi and Brown (2008), Ferreira and Otley (2009), Kleine and Weißenberger (2014) and Goebel and Weißenberger (2017).

In this research, the MCS is examined from both formal and informal perspectives, as advocated by Kleine and Weißenberger (2014) and Goebel and Weißenberger (2017). With this choice, this research seeks to broaden the accounting literature considering the contexts of team effectiveness (Kathuria & Davis, 2001; Chong & Mahama, 2014), organizational identification (Carmeli et al., 2007; Cavazotte et al., 2017; Santos et al., 2019) and information sharing (Ushiro, 2009).

Specifically, this broadening of the literature includes (i) discussing the impact of MCSs on team effectiveness; (ii) identifying the intervening role of information sharing in the relationship between MCSs and team effectiveness; and finally, (iii) discussing the intervening role of organizational identification in the relationship between MCSs and information sharing.

2.1 Management control Systems and team effectiveness

Understanding the behavioural consequences of MCSs (Hall, 2008; Hall, 2011) represents a contemporary approach to management accounting research. Thus, in terms of team effectiveness, this flow of literature has received contributions from researchers such as Kathuria and Davis (2001), Piccoli et al. (2004) and Chong and Mahama (2014). Along these lines, Lent et al. (2006) show that team effectiveness represents a social cognitive element that can contribute to the understanding of how individuals act together as a team.

Theorists seek to understand the connection between performance and quality in organizations (Kathuria & Davis, 2001). For example, the research by Kathuria and Davis (2001) shows the relationship between managerial performance and

workforce management, from the perspective of 14 factory managers. Research shows that managers can use workforce management practices to drive employees towards organizational progress, improve the quality of their own work, and enhance problem solving. Thus, it is illustrated that MCSs, with their fundamental function of driving behaviours and monitoring workers in interdependent task environments, have the ability to create a competitive advantage for organizations, which is a result that can have positive effects in the short and long terms.

Piccoli et al. (2004) sought to determine the effects of MCSs on virtual team effectiveness. The results from the perceptions of 51 student teams from different countries reveal that the control structure of the team eligible for research as behavioural controls had no tangible effect on team performance. These results contradict the expectations of the researchers themselves, as less stringent controls were expected to contribute to teamwork processes. As a consequence, there has arisen a need to understand the effects of MCSs on the development of traditional teams.

Chong and Mahama (2014) discuss the impact of using interactive and budget diagnostics on motivation and team effectiveness. The results reveal that in biotechnology companies, interactive budget use has a positive effect on team effectiveness. Interactive budgeting is shown to be a predictor of team behaviour, and sometimes, these types of controls value flexibility and align with an uncertain environment.

From the studies listed, it is important to understand the configuration of MCSs in other team environments, as these elements of the subject's social cognition (Lent et al., 2006) are influenced by the structure and organizational environment in which the task is developed. Thus, based on the theoretical and empirical elements presented, we support the formulation of the first hypothesis of this investigation.

H1. The Management control System positively influences team effectiveness.

Not rejecting H1 has implications for the research field. It is inferred that the dynamics of MCSs can be seen as an inducer of individual behaviour in a hospital organization, especially regarding team behaviour. An intertwining of social-technical and cognitive elements is envisioned that facilitates the managerial performance of the organization and can lead to more effective care delivery through alignment between MCSs and team effectiveness.

2.2 Mediator effect of information sharing on Management control Systems and team effectiveness

Chong and Mahama (2014) encourage further investigation of the relationship between MCS and team effectiveness. Among the results, Chong and Mahama (2014) highlight that the intervention of collective elements between MCSs and team effectiveness represents an opening for new research to expand the existing literature involving accounting aspects in the context of teams.

Thus, we refer to the literature on teams, which suggests that information is the main resource that members bring to the group and that their ability to consider more information and from various sources is the main reason why teams perform better than individuals (Chong & Mahama, 2014). When team members are more informed, they are more likely to effectively discuss and evaluate one another's judgement, which leads to higher-quality decisions and more effective use of resources (Henry, 1995).

In this sense, the ability of groups to consider more information and diverse sources is the main reason why teams are expected to make better decisions than individuals acting alone. Generally, information sharing can be understood as a set of activities whereby information is provided to others proactively or upon request so that it impacts other people's image and creates a shared understanding or mutually compatible world (Sonnenwald, 2006). From this perspective, the information-sharing process incorporates two main aspects: giving information to and receiving information from others (Sonnenwald, 2006).

For information sharing to succeed, there is a need for adequate tools, means and mechanisms for information exchange (Gurses & Xiao, 2006; Beuren et al., 2020). In the sharing between professionals of a hospital, information exchange is known to occur through formal and informal means. Formally, information sharing is stimulated by institutionalized channels such as the patient's medical record and multi-professional rounds (Santos, 2019). Informally, it is clear that much of the information is shared through relationship channels (face to face), i.e., dialogued during the work routine (Santos, 2019).

Information sharing is not an individual action but a collective and collaborative effort that occurs in networks - intragroup and intergroup - of an entire organization (Santos, 2019). Such sharing can be stimulated by existing management practices in the organization (Souza & Beuren, 2018), enabling better behavioural outcomes, such as team effectiveness.

Thus, information sharing can be an actor that mediates the relationship between MCS and the team effectiveness

of a hospital institution. This premise is built on the combination of the theoretical elements listed above, based on contributions by researchers such as Piccoli et al. (2004) and Chong and Mahama (2014). Thus, from the set of elements discussed, we try to broaden the discussions in the literature flow regarding the relationship between MCS and team effectiveness by raising the second hypothesis of this research:

H2. Information sharing mediates the relationship between the Management control System and team effectiveness.

Not rejecting H2 reinforces the need to consider the intervening roles in the relationship between MCS and team effectiveness. Information sharing, in this respect, enhances how the MCS influences team effectiveness, as such a process represents the social and cognitive construction of individuals when they are acting as a team.

This intervening role makes sense in interdependent environments such as hospitals, as information sharing refers to the extent to which information is transmitted to peers and colleagues in an interprofessional relationship (Ushiro, 2009). Such information sharing is considered a *sine qua non* for interprofessional collaboration, given the need for negotiation and agreement among different experts and professional areas (Zwarenstein et al., 2009) and recalling that the tasks to be performed by the care teams involve compliance with written protocols and instructions, as the resource they manage is human life itself.

2.3 Moderator effect of organizational identification on Management control Systems and information sharing.

Organizational identification is presented as a behavioural attribute that contributes to the performance and managerial performance of organizations (Cavazotte et al., 2017; Santos et al., 2019). This attribute represents a self-perception of affiliation or connection with certain social groups (Carmeli et al., 2007; Cavazotte et al., 2017; Santos et al., 2019). According to Dutton et al. (1994, p. 242), organizational identification refers to "the cognitive connection between the definition of an organization and the definition of a person applied to him or herself".

The effects of employees' organizational identification can align with the motivations and ways in which they behave within the organization (Hall, 2011; Cavazotte et al., 2017; Santos et al., 2019). According to Carmeli et al. (2007), organizational identification has implications for organizational continuity since such an aspect is embedded in the behaviour of individuals within the organization.

Thus, organizational identification presents itself as a multidimensional attribute that drives the employee's attitudes and actions towards the organizational configuration. The degree to which the employee identifies with the organization can, therefore, exert positive effects on the organization. Examples of such effects include effectiveness in the development of tasks, proper use of management systems and contribution to the improvement of organizational strategy and individuals, thereby resulting in motivation, job satisfaction, level of commitment to organizational challenges and relationships developed within the organizational scope (Carmeli et al., 2007; Cavazotte et al., 2017; Santos et al., 2019).

The key point of this organizational identification process is the subject's inclination to create feelings of belonging to a social group (Ellemers et al., 1999; Cavazotte et al., 2017; Santos et al., 2019). Thus, organizations conceived as diffuse social and interest systems that have highly interdependent tasks should be careful not to marginalize this attribute in labor relations and in monitoring subject behaviour through MCS.

Due to these influences, organizational identification, as a way to result in benefits for the organization, should also be a concern for managers when applied to the aspects related to MCS. Depending on the activity to be developed, whether individual or collective, the MCS can expand or mitigate the performance of each individual because it has the characteristic both of providing freedom to the production and/or service process and also limiting it (Carmeli et al., 2007).

This MCS moldability in the presence of a certain level of organizational identification can also impact information sharing, and as in low-routine and high task-interdependence environments, there is a likelihood that self-perceptions of belonging in a group membership will influence the sharing process (Oakes et al., 1994; Carmeli et al., 2007).

Information sharing in a hospital environment refers to how information is transmitted (Ushiro, 2009); this sharing is embedded in protocols and standards that aim to conduct service delivery in a uniform manner. Nevertheless, the environmental conditions present in this space, especially those regarding organizational identification, may interfere in this process, as the individual develops this organizational self-perception and tends to become more sensitive to situational suggestions coming from different experiences of professionals working in the hospital environment (Carmeli et al., 2007; Zwarenstein et al., 2009).

Considering the conceptual and empirical nature of the listed studies, it is argued that organizational identification moderates the relationship between MCS and information sharing. Thus, the third hypothesis of the research is conjectured.

H3. Organizational identification moderates the relationship between Management control Systems and information sharing.

From the listed hypotheses, the conceptual model proposed for this investigation is presented in Figure 1.

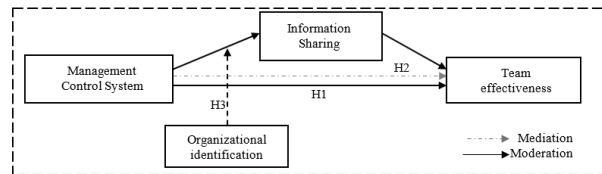


Figure 1. Proposed conceptual model.

As shown in Figure 1, the study aims to discuss how an MCS impacts team effectiveness (H1). Moreover, it is argued that information sharing intervenes in its mediating dimension in the relationship between MCSs and team effectiveness (H2) and that the relationship between MCSs and information sharing is intensified by the presence of organizational identification (H3).

3. Methodological Procedures

3.1 Sample selection and data collection

A single entity survey was carried out through an electronic questionnaire sent to hospital professionals. This choice is justified by the fact that the problem research is studied in depth, considering a single organizational context (Mucci et al., 2016). The population of this research study is composed of the professionals of a Brazilian Area Military Hospital, who were selected through convenience sampling. Prior to the conducting of this research, which took place in person between October 1st and 10th, 2019, the project was approved by the hospital's internal Ethics Committee. The interviewees consented to their participation using the Free and Clarified Consent Form, prepared in accordance with resolutions 466/2012 and 510/2015 of the National Health Council.

The sample size was calculated by using two exogenous latent variables (MCS): information sharing and organizational identification. The base effect size was 0.15, the significance level of α was 0.05, and the power of the $1-\beta$ sample was 0.8, with five predictors. The minimum sample required for the model was 92 respondents, but the final sample obtained for this survey was 105 responses.

3.2 Variable measurement

The study has four main constructs: an MCS with formal and informal dimensions (Kleine & Weißenberger, 2014); team effectiveness (Kathuria & Davis, 2001; Chong & Mahama, 2014); organizational identification (Carmeli et al., 2007);

and information sharing (Ushiro, 2009). It is noteworthy that the instruments went through the back-translation process and also through pre-tests with three doctors and two hospital managers who helped in the refinement of the questions.

The formal dimension of the MCS construct is defined as written management mechanisms that influence the likelihood that employees or groups will behave in ways that support the organization's objectives (Ayers et al., 2001). Informal individuals are considered to be tacitly aware and are communicated with at all levels of the organization, often throughout the entire recruitment, training and development process (Lebas & Weigenstein, 1986). The research instrument for the formal MCS had nine items, and the informal one had ten.

Team effectiveness can be analyzed by collective perception, as it is a social-cognitive element that can help explain how individuals work together as a team (Chong & Mahama, 2014). Such effectiveness can be evaluated based on the quality, accuracy and amount of work performed, the opportunity and satisfaction with the work performed, and operational efficiency (Kathuria & Davis, 2001). Thus, the team effectiveness construct was composed of six statements from the Chong and Mahama (2014) questionnaire, which assessed how satisfied the individual was with the effectiveness of his or her team.

Organizational identification is the degree to which a member defines himself or herself by the same attributes that he or she believes to define the organization (Cavazotte et al., 2017; Santos et al., 2019). This process occurs through cognitive categorization processes, in which self-categories of the organizational associations and their similarities with others in the organization, as well as differences in other different organizations, are formed (Turner, 1985; Cavazotte et al., 2017; Santos et al., 2019). The organizational identification construct was composed of 5 assertions based on the study by Carmeli et al. (2007).

In a hospital setting, information sharing refers to the extent to which information is transmitted to peers and colleagues in an interprofessional relationship (Ushiro, 2009) and is considered a *sine qua non* for interprofessional collaboration, given the need for negotiation and agreement between different experts and professional areas (Zwarenstein et al., 2009). Thus, the information-sharing construct was composed of four items used by Ushiro (2009), the purpose of which was to understand how information sharing occurs between team members in relation to professional activities. These constructs, with the exception of team effectiveness, were measured by using multiple items with a five-point Likert

scale ranging from strongly disagree to totally agree. The team effectiveness construct was also rated by using a five-point Likert scale, but the variations ranged from dissatisfied to very satisfied. In addition, eight statements were also elaborated that aimed to determine respondents' profile information, such as gender, age, education, work unit, function, and experiences.

3.3 Data analysis

To analyze the data and test the hypotheses, we used the structured equation modelling (SEM) technique estimated from partial least squares (PLS). In the structural model, we sought to identify the influence of formal and informal controls for each latent variable (organizational identification, information sharing, and team effectiveness).

PLS was used because it is a suitable technique for studies with small samples (Chin, 1998). The analysis of the PLS-SEM is performed in two stages: the first deals with the adequate validity of the constructs, ascertained by the relationship between the indicators and the latent variables (or constructs), and allows the researcher to evaluate the reliability and validity of the constructs. The second deals with the relationship between latent variables and allows us to verify whether an exogenous latent variable is related to an endogenous latent variable (Hair Jr. et al., 2016).

3.4 Respondent Profiles

This research sample included 105 respondents: 60 males, 40 females and 5 who chose not to define their gender. These respondents form patient care teams as well as administrative staff. Most respondents (30.48%) are aged between 35 and 44 years, followed by the 25-34 age range (29.52%). This young overall age may be observed because, in many cases of hospital units, employees generally start their careers at a very young age (between 18 and 25 years) and, in military hospitals are promoted after a certain period to higher posts and ranks.

Regarding education, 39.05% of respondents have postgraduate education, followed by 33.33% who have or are currently pursuing higher education. Among those who have higher education or are still pursuing it, most of them have studied in the fields of medicine, dentistry, administration, nursing and pharmacy.

The majority of respondents (60.95%) have been working in the hospital and performing their current job function (48.57%) for a period of 1 to 5 years, which reflects a relatively young workforce, assuming the existence of current

knowledge and adequate performance of their daily hospital duties.

Finally, it is noteworthy that the hospital analyzed is a hospital unit that has served the military and civilians for over 100 years. Throughout its existence, it has provided relevant services to the population, either in the specific care of the military and its dependents or in cases of public calamity.

4. Results and discussion

4.1 Measurement model

The measurement model is obtained from the PLS algorithm technique, which allows the testing of the reliability and validity of the research instrument. The reliability in this research is indicated by the composite reliability and the average variance extracted (AVE), the discriminant and other criteria. The measurement model is shown in Table 1.

Table 1 shows that the relationships proposed in this model are in agreement with the literature. The highest reliability value found was 0.944, for the IFC, and the lowest was the reliability of information sharing, at 0.807. To confirm the reliability, this research opted for composite reliability since it is not sensitive to scale items as Cronbach’s alpha (CA) is (Hair Jr. et al., 2016).

Regarding validity, the AVE initially demonstrates that the constructs are valid and that the variance of each item of the respective construct is shared with the others. The highest value

was obtained for the MCS (0.69), and the lowest value was obtained for information sharing (0.512). Overall, all values were greater than the 0.5 thresholds. The validity was also attested by the Fornell and Larcker matrices and cross-loading, which confirms the validity of the research constructs according to the proposed theoretical model.

4.2 Structural model

The bootstrapping technique is adopted to estimate structural paths. This technique consists of the application of 5000 subsamples and interactions, which allows a path diagram that either confirms or rejects the study hypotheses to be obtained (Hair Jr. et al., 2016). Table 2 shows the size and significance of the path coefficients.

Table 2: Structural model

Paths	B	Statistic t	P-value	Hypotheses
INFS -> EEF	0,077	1.086	0,278	H1
MCS -> EEF	0,647	12.147	0,000***	
MCS -> INFS	0,369	4.037	0,000***	H2
MCS -> INFS -> EEF	0,028	0,978	0,328	
OID -> INFS	0,371	3.842	0,000***	H3
MCS X OID -> INFS	0,150	2.060	0,040**	

Note: FC= formal control; IFC= informal control; TEF= team effectiveness; INFS= information sharing; OID= organizational identification; and MCS= management control system.

Note 1: *p<0.10; **p<0.05; ***p<0.01.

Note 2: N = 105

The first hypothesis (H1) posited a relationship between MCSs and team effectiveness, and the results show that there is a positive and statistically significant relationship at the 1% level (β: 0.647,

Tabela 1: Modelo de mediação

Variables	Composite Reliability	AVE	Discriminant Validity				
			TEF	INFS	OID	MCS	
FC	0,909	0,530	EE	0,811			
IFC	0,944	0,628	CINF	0,371	0,715		
TEF	0,905	0,658	IO	0,326	0,463	0,767	
INFS	0,807	0,512	SCG	0,682	0,456	0,406	0,833
OID	0,851	0,588					
MCS	0,818	0,695					

Note: FC= formal control; IFC= informal control; TEF= team effectiveness; INFS= information sharing; OID= organizational identification; and MCS= management control system.

$p < 0.000$). This evidence indicates that individuals realize that the formal and informal dimensions of the MCS allow teams to be more effective and members to perform their tasks better. For the hospital environment, the presence of these different types of controls is important, since there is an implication for better performance of professionals in the environment.

The second hypothesis (H2) asserted that the relationship between MCSs and team effectiveness is better explained by information sharing, implying a mediation relationship. The results reveal the rejection of this hypothesis since no statistically significant relationship was observed ($\beta: 0.028$; $p < 0.328$). These findings indicate that while a MCS leads to significantly increased information sharing among doctors, nurses and hospital managers at a level of 1% ($\beta: 0.369$; $p < 0.000$), they together do not lead to greater team effectiveness. It is inferred that the information, when shared by itself, was not configured in this study as an antecedent of team effectiveness since, in addition to being shared, information must have content relevant to the tasks of each team member.

Noticing this aspect, we investigated whether there is a relationship between MCSs and information sharing moderated by organizational identification. The arguments linked to this hypothesis assert that information is only shared better if individuals feel part of the organization and seek better execution of their tasks. Thus, the results indicated that organizational identification moderates the relationship between MCSs and team effectiveness at a significance level of 5% ($\beta: 0.150$; $p < 0.040$).

These results allow the non-rejection of H3 and indicate that organizational identification has an important role in achieving optimal information sharing. For physicians and nurses, organizational identification, which is linked to the individual's degree of belonging to the group, is pertinent to information sharing for team effectiveness to be achieved. It should also be noted that the confirmation of this hypothesis is due to the positive and significant relationship between MCSs and information sharing at a level of 1% ($\beta: 0.369$; $p < 0.000$). Hair Jr. et al. (2016) point out that for the moderation test to be performed, it is essential that the relationship between the moderating variable and the dependent be significant.

Predictive validity was also assessed by Pearson's coefficient of determination (R^2) and predictive relevance by the Stone-Geisser indicator (Q^2). Team effectiveness was found to be 47% (R^2) and explained by the MCS and information sharing. Information sharing had a predictive validity of 30%. Predictive validity indicators are of great effect, as noted by Hair Jr. et al. (2016). For predictive relevance, it was observed that the Q^2 of team effectiveness was 0.275, and information sharing was 0.12.

Therefore, the model has predictive relevance.

4.3 Discussion

Regarding the distinction between individual and team effectiveness, Bandura (1997) argues that it is necessary to understand that team effectiveness influences the tasks that employees perform in teams, the effort they make to achieve goals and their motivation and persistence when the group's efforts fail to produce results. Moreover, team effectiveness can be influenced by the organization's MCS, which aims to ensure that team members understand the actions required to achieve organizational goals. Thus, the MCS has generally been used to increase group performance within organizations (Birnberg, 2011) and thereby achieve better results.

The positive influence of the MCS on team effectiveness was confirmed by corroborating that the MCS can be seen as an inducer of individual behaviour in a hospital organization. This process envisions an intertwining of technical and cognitive social elements, which facilitates the management of the organization and can lead to better service delivery through alignment between the MCS and team effectiveness.

The literature on teams suggests that information is the main resource that members bring to the team and that the ability of teams to consider more information from a variety of sources is the main reason why they are expected to perform better than an individual (Chong & Mahama, 2014). Thus, information sharing was expected to mediate the relationship between the MCS and team effectiveness, which has not been confirmed. This finding reflects that greater team effectiveness is independent of greater information sharing, regardless of the type and use of the organization's MCS.

Information sharing can be stimulated by existing management practices in the organization, such as an MCS (Souza & Beuren, 2018), as well as by attitudes such as organizational identification by individuals (H3). Thus, it is confirmed that information is better shared if the individual feels part of the organization and seeks a better fulfilment of his or her tasks.

In a hospital environment, for successful information sharing to occur, there is a need for adequate tools, means and mechanisms for information exchange (Gurses & Xiao, 2006), as well as organizational identification, which is highly dependent on context (Tajfel & Turner, 1979; Cavazotte et al., 2017; Santos et al., 2019). Thus, MCSs can enhance organizational identification and information sharing because when an individual values his or her work

for an organization and has a sense of pride in organizational interaction, that individual tends to share more information and more knowledge of his or her area of training, which is of great relevance in a hospital organization.

5. Conclusions

This study examined the MCS effects on team effectiveness under the mediation of information sharing and under the moderation of organizational identification. The results showed the presence of both types of control in the researched organization, and such evidence is in line with the previous literature. The study also confirmed that information sharing is of great importance for team effectiveness, given the need for negotiation and agreement between different experts and professional areas (Zwarenstein et al., 2009). From this perspective, the information-sharing process incorporates two main aspects: giving information to and receiving information from others (Sonnenwald, 2006).

5.1 Theoretical implications and empirical implications

This study contributes to the literature by jointly examining the relationships among MCSs, team effectiveness, information sharing, and organizational identification in hospital organizations (Cavazotte et al., 2017; Santos et al., 2019). The results of this study indicated that organizational identification moderates the relationship between the MCS and information sharing.

One of the contributions of this study refers to the evidence that information sharing and organizational identification stand out in collaborative contexts, assisting in team effectiveness mainly by enhancing team performance. The findings also validate the constructs analyzed in the hospital context.

This research also has practical implications, as it shows that formal and informal characteristics of the MCSs have a positive and significant influence on team effectiveness. Moreover, the study confirmed the relationship between the MCS and information sharing moderated by organizational identification. However, the existence of a significant relationship between the MCS and team effectiveness not mediated by information sharing has not been confirmed.

Thus, it is emphasized that the study results suggest that formal and informal controls are important elements of the MCS that influence subsequent outcomes and behaviours and, in the case of this research, team effectiveness. Thus, hospital managers must pay attention to the types of MCS, as they are associated with individuals' attitudes and behaviours, which are reflected in organizational outcomes.

5.2 Limitations and Future Research

This research, despite the theoretical and technical care that the researchers adopted, has limitations. The first limitation is that the sample is composed of respondents from only one hospital entity; that is, sampling is not probabilistic but rather based on convenience. It is recommended for future research that respondents from teams from different sectors and from different entities be included.

The second limitation is that because this study is cross-sectional, caution is recommended in interpreting the results because the research strategy used was based on respondents' perception of the items of the analyzed constructs. Subjective aspects may be present at the moment of answering, as well as the moment of conducting the research. Thus, conducting longitudinal studies may contribute to further deepening the theme within the organizational environment.

In addition to exploring the limitations pointed out for future research, other aspects may be contemplated, such as the effects of controls (formal and informal) on team performance. In addition, future research may explore the effects of information sharing on team effectiveness mediated by team identification.

References

- Anthony, R. N. (1965). *Planning and control systems: A framework for analysis*. Division of Research, Graduate School of Business Administration, Harvard University.
- Ayers, D. J., Gordon, G. L., & Schoenbachler, D. D. (2001). Integration and new product development success: The role of formal and informal controls. *Journal of Applied Business Research (JABR)*, 17(2). <https://doi.org/10.19030/jabr.v17i2.2079>
- Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York, NY: Freeman.
- Beuren, I. M., Santos, V. D., Bernd, D. C., & Pazetto, C. F. (2020). Reflexos do compartilhamento de informações e da inovação colaborativa na responsabilidade social de cooperativas. *Revista Brasileira de Gestão de Negócios*, 22, 310-330. <https://doi.org/10.7819/rbgn.v22i2.4052>
- Birnberg, J. G. (2011). A proposed framework for behavioral accounting research. *Behavioral Research in Accounting*, 23(1), 1-43. <https://doi.org/10.2308/bria.2011.23.1.1>
- Carmeli, A., Gilat, G., & Waldman, D. A. (2007). The role of perceived organizational performance in organizational

- identification, adjustment and job performance. *Journal of Management Studies*, 44(6), 972-992. <https://doi.org/10.1111/j.1467-6486.2007.00691.x>
- Cavazotte, F. D. S. C. N., Araújo, F. F. D., & Abreu, A. L. D. (2017). Identificação organizacional entre funcionários públicos brasileiros: um estudo no setor cultural. *Revista Brasileira de Gestão de Negócios*, 19, 289-306. <https://doi.org/10.7819/rbgn.v19i64.3366>
- Chin, W. W. (1998). *The partial least squares approach for structural equation modelling*. In: Marcoulides, G. A. (Ed.). *Modern methods for business research*. New York: Lawrence Erlbaum, 295-336.
- Chong, K. M., & Mahama, H. (2014). The impact of interactive and diagnostic uses of budgets on team effectiveness. *Management Accounting Research*, 25(3), 206-222. <https://doi.org/10.1016/j.mar.2013.10.008>
- Dutton, J. E., Dukerich, J. M., & Harquail, C. V. (1994). Organizational images and member identification. *Administrative Science Quarterly*, 239-263. <https://doi.org/10.2307/2393235>
- Ellemers, N., De Gilder, D., & Haslam, S. A. (2004). Motivating individuals and groups at work: A social identity perspective on leadership and group performance. *Academy of Management Review*, 29(3), 459-478. <https://doi.org/10.5465/amr.2004.13670967>
- Ferreira, A., & Otley, D. (2009). The design and use of performance management systems: An extended framework for analysis. *Management Accounting Research*, 20(4), 263-282. <https://doi.org/10.1016/j.mar.2009.07.003>
- Goebel, S., & Weißenberger, B. E. (2017). The relationship between informal controls, ethical work climates, and organizational performance. *Journal of Business Ethics*, 141(3), 505-528.
- Gurses, A. P., & Xiao, Y. (2006). A systematic review of the literature on multidisciplinary rounds to design information technology. *Journal of the American Medical Informatics Association*, 13(3), 267-276. <https://doi.org/10.1197/jamia.M1992>
- Hair Jr., J. F., Hult, T. M., Ringle, C. M., & Sarstedt, M. A. (2016). *Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Los Angeles: Sage.
- Hall, M. (2008). The effect of comprehensive performance measurement systems on role clarity, psychological empowerment and managerial performance. *Accounting, Organizations and Society*, 33(2-3), 141-163. <https://doi.org/10.1016/j.aos.2007.02.004>
- Hall, M. (2011). Do comprehensive performance measurement systems help or hinder managers' mental model development? *Management Accounting Research*, 22(2), 68-83. <https://doi.org/10.1016/j.mar.2010.10.002>
- Henry, R. A. (1995). Improving group judgment accuracy: Information sharing and determining the best member. *Organizational Behavior and Human Decision Processes*, 62(2), 190-197. <https://doi.org/10.1006/obhd.1995.1042>
- Hyvönen, T., Järvinen, J., & Pellinen, J. (2008). A virtual integration - The management control system in a multinational enterprise. *Management Accounting Research*, 19(1), 45-61. <https://doi.org/10.1016/j.mar.2007.08.001>
- Kathuria, R., & Davis, E. B. (2001). Quality and work force management practices: The managerial performance implication. *Production and Operations Management*, 10(4), 460-477. <https://doi.org/10.1111/j.1937-5956.2001.tb00087.x>
- Kleine, C., & Weißenberger, B. E. (2014). Leadership impact on organizational commitment: The mediating role of management control systems choice. *Journal of Management Control*, 24(3), 241-266.
- Lebas, M., & Weigenstein, J. (1986). Management Control: The Roles of Rules, Markets and Culture. *Journal of Management Studies*, 23(3), 259-272. <https://doi.org/10.1111/j.1467-6486.1986.tb00953.x>
- Lent, R. W., Schmidt, J., & Schmidt, L. (2006). Collective efficacy beliefs in student work teams: relation to self-efficacy, cohesion, and performance. *Journal of Vocational Behavior*, 68, 73-84. <https://doi.org/10.1016/j.jvb.2005.04.001>
- Lopez-Valeiras, E., Gomez-Conde, J., & Lunkes, R. J. (2018). Employee reactions to the use of management control systems in hospitals: Motivation vs. threat. *Gaceta sanitaria*, 32, 129-134. <https://doi.org/10.1016/j.gaceta.2016.12.003>
- Malmi, T., & Brown, D. A. (2008). Management control systems as a package - Opportunities, challenges and research directions. *Management Accounting Research*, 19(4), 287-300. <https://doi.org/10.1016/j.mar.2008.09.003>
- Merchant, K. A., & Van der Stede, W. A. (2017). *Management*

- control systems: performance measurement, evaluation and incentives. Harlow UK: FT Prentice Hall.
- Mucci, D. M., Frezatti, F., & Dieng, M. (2016). As múltiplas funções do orçamento empresarial. *Revista de Administração Contemporânea*, 20(3), 283-304. <https://doi.org/10.1590/1982-7849rac2016140121>.
- Oakes, P. J., Haslam, S. A., & Turner, J. C. (1994). *Cognition and the group: social identity and self-categorization theory*. In Oakes, P. J., Haslam, S. A. and Turner, J. C. (Eds), *Stereotyping and Social Reality*. London: Blackwell, 80-103.
- Piccoli, G., Powell, A., & Ives, B. (2004). Virtual teams: team control structure, work processes, and team effectiveness. *Information Technology & People*, 17(4), 359-379. <https://doi.org/10.1108/09593840410570258>
- Santos, E. A. (2019). *Interprofessional collaboration and formality of management controls: a study of the effects on social identity and job satisfaction*. Thesis (Doctorate in Accounting). Accounting Sciences Program at the Federal University of Santa Catarina. Retrieved in <https://repositorio.ufsc.br/handle/123456789/204440>.
- Santos, E. A., Sallaberry, J. D., Gonzaga, C. A. M., & Soares, S. (2019). Responsabilidade social corporativa e identificação organizacional: influência no engajamento dos funcionários. *Revista Universo Contábil*, 15(4). <http://dx.doi.org/10.4270/ruc.2019432>
- Simons, R. (1995). *Levers of control: How managers use innovative control systems to drive strategic renewal*. Harvard Business Press.
- Sonnenwald, D. H. (2006). Challenges in Sharing Information Effectively: Examples from Command and Control. *Information Research: An International Electronic Journal*, 11(4).
- Souza, G. E., & Beuren, I. M. (2018). Reflexos do sistema de mensuração de desempenho habilitante na performance de tarefas e satisfação no trabalho. *Revista Contabilidade & Finanças*, 29(77), 194-212. <https://doi.org/10.1590/1808-057x201805850>
- Tajfel, H., & Turner, J. C. (1979). *An integrative theory of inter-group conflict*. In W. G. Austin & S. Worchel (Eds.). *The social psychology of inter-group relations* (p. 33-47). Monterey, CA: Brooks/Cole.
- Turner, J. C. (1985). *Social categorization and the self-concept: a social cognitive theory of group behaviour*. In E.J. Lawler (ed.), *Advances in Group Processes*. Greenwich, CT: JAI Press. v. 2, 77-122.
- Ushiro, R. (2009). Nurse-Physician Collaboration Scale: development and psychometric testing. *Journal of Advanced Nursing*, 65(7), 1497-1508. <https://doi.org/10.1111/j.1365-2648.2009.05011.x>
- Vandenbosch, B. (1999). An empirical analysis of the association between the use of executive support systems and perceived organizational competitiveness. *Accounting, Organizations and Society*, 24(1), 77-92. [https://doi.org/10.1016/S0361-3682\(97\)00064-0](https://doi.org/10.1016/S0361-3682(97)00064-0)
- Zwarenstein, M., Goldman, J., & Reeves, S. (2009). Interprofessional collaboration: effects of practice-based interventions on professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews*, 3(3), 1-31. <https://doi.org/10.1002/14651858.CD000072.pub2>