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Enablers and Barriers to Implement COVID-19 Measures in Long-Term Care Facilities: A Mixed Methods Implementation Science Assessment in Chile

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Background: As elsewhere, in Chile the COVID-19 affected disproportionately older people, and particularly people living in long-term care facilities. Considering this problem, the Government issued a series of guidelines and protocols to prevent and manage COVID-19 outbreaks in these facilities.

Methods: This study aims to identify barriers and enablers that affect the implementation of these prevention and management measures. For the analysis, we used an implementation science approach and a mixed methods strategy — a survey among facilities' managers and interviews among staff — classifying enablers and barriers into four categories: agreement with the intervention's goals, financial resources to implement the measures, technical needs of the intervention, and cultural factors in the facilities.

Results: Results highlight the importance of the four factors above in the implementation of COVID-19 guidelines and protocols. Managers and staff differ in their view of the main enablers and barriers for implementation. However, they both identify the knowledge about the measures and availability of personal protective equipment as enablers and human resources as a potential barrier.

Conclusions: The identification of several factors related to goals and culture highlights the need to adopt a broad implementation approach when designing interventions for long-term care facilities, avoiding restricting the discussion to the availability of resources.

Highlight:

- Understanding implementation factors is key to design and assess successful interventions.
- The prevention and management measures implemented in the Chilean facilities found barriers (e.g., infrastructure, human capital and resistance to change), and enablers (e.g., PPE availability and trust in technical staff) that could have impacted the effectiveness of the measures proposed.
- Tackling the identified implementation barriers using feasible and evidence based strategies could improve the effectiveness of the measures.

Keywords: COVID-19; nursing homes; long-term care; implementation science

Contribution to the literature

- The article highlights the need to adopt an implementation science perspective for designing, implementing, monitoring and evaluating intervention targeted to older people.
- It presents useful information for policy makers on a high-relevance problem, as COVID-19 in long-term care facilities.
- Results show the relevance of considering usually ignored aspects of implementation, such as alignment of goals and cultural issues.

- The use of a mixed method approach helped not only assess the success of the intervention but also identify relevant implementation factors, key for redesign future policies.

Introduction

Older people (OP) living in long-term care facilities (LTCF) have been disproportionately affected by COVID-19. Early epidemiological studies described lethality rates that could reach up to 35% within these facilities (McMichael *et al.*, 2020). During the pandemic, COVID-19-related deaths in LTCF represented as many as 46% of total COVID-19-related deaths, exceeding 80% in some countries (Comas-Herrera *et al.*, 2020a). To minimize the impact of COVID-19 in LTCFs, the World Health Organization (WHO) has called for including LTCF in each country's

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response and mobilizing funding to implement prevention and management strategies in these facilities (WHO, 2020); accordingly, several countries have designed and implemented LTCF-specific prevention and management measures (Comas-Herrera *et al.*, 2020b).

In Chile, policy responses to tackle COVID-19 in LTCF included banning visitors and implementing sanitary barriers in each facility (Ministerio de Salud, 2020; Villalobos *et al.*, 2020). Furthermore, the Ministry of Health (MoH), the National Service for Older People (*Servicio Nacional de Personas Mayores*, SENAMA) and the Chilean Geriatrics and Gerontology Society (SGGCh) generated a set of enforceable and unenforceable prevention and management measures, which included:

- Use Personal Protective Equipment (PPE)
- Cleaning and disinfection (including clothes)
- Implementing isolation areas
- Implementing a clean area for staff
- Actions needed when a COVID-19 case is suspected
- Instructions to manage COVID-19-related or non-related deaths in the residence
- Information regarding other mitigation strategies such as transfer to sanitary houses

Furthermore, SENAMA implemented a mitigation strategy based on face-to-face technical support, PPE supply, staff replacement, field testing with rt-PCR and the temporary transfer of COVID-19 residents to sanitary houses (Browne *et al.*, 2020). These measures were summarized in a series of guidelines and protocols for COVID-19 prevention and management, issued by the government in April 2020 (SENAMA, 2020).

Although, these initiatives follow international recommendations and best practices observed in other countries (Comas-Herrera *et al.*, 2020b), an adequate design of prevention and management measures contributes to, but does not necessarily ensure, their effectiveness. Other factors related to the implementation process could play a critical role. For example, in the UK Rajan and McKee (2020) describe that working partnership with authorities, staff morale and wellbeing, and PPE supply, were critical factors that enabled adequate implementation of preventive measures.

In Chile, informal carers (e.g. family members) provide care for the great majority of older persons with support needs (Villalobos Dintrans, 2019; Palacios *et al.*, 2020). Institutional facilities provide care to approximately 25,000 older persons (1.4% of the population 65 or older) in a mix of public, private non-profit, and private for-profit institutions that mainly operate nursing-home facilities (Villalobos Dintrans, 2018; Browne *et al.*, 2020). These facilities require the authorization of the MoH, which regulates infrastructure (e.g., number of allowed residents per room) and human resources (e.g., number of staff per resident). It is estimated that for each registered LTCF, there is another unregistered, informal and unregulated LTCF (Marin *et al.*, 2004).

The Decreto 14 regulates registered LTCF since 2010. It stipulates that facilities ought to count with adequate

personnel to satisfy physical needs in a permanent manner (Article 12). The decree specifies the number of staff per number of residents and their level of dependency (Articles 17 and 18), that all LTCF must have a food handler and cleaning staff (Article 13). The decree also specifies that severely dependent residents require an on-site nurse assistant for 12 hours during the day (on-call at night) and that moderately dependent residents require an on-site nurse assistant for 2 hours (on-call 24 hours) (Articles 17 and 18). The decree recommends that facilities offer nursing, nutritionist, physical therapist, physical education or social assistant services (Article 14) (Ministerio de Salud, 2010).

In registered LTCF, healthcare processes, such care in isolation areas and other infection-disease-control measures are not regulated nor surveyed (Ministerio de Salud, 2010), and even less so in unregistered LTCF. LTCF are governed by a culture of social assistance rather than a vision that combines social and health objectives (the government has recognized the need to move towards a model that combines and integrates them, see SENAMA, 2014, 2015). Therefore, a healthcare-oriented organizational culture is not necessarily rooted in these facilities. These factors can, in turn, pose barriers for the implementation and the effectiveness of the COVID-19 prevention and management strategy.

This study aims to identify barriers and enablers that affected the implementation of prevention and management of the COVID-19 measures designed by Chilean policymakers for LTFCs. We draw on an implementation science framework, looking at organizational-level factors that explain differences between the results intended by policymakers and observed results. Data was collected and analyzed using a mixed methods strategy (on-line survey and in-depth semi-structured interviews) applied on the two largest non-profit LTFC providers in Chile.

Materials and methods

Framework of analysis: Implementation science

Implementation science (IS) helps understanding and translating theoretical interventions and scientific knowledge into practice in a real-world setting (Villalobos Dintrans *et al.*, 2019). This approach acknowledges the difference between efficacy (outcome of an intervention under ideal conditions) and effectiveness (outcome of an intervention under normal conditions) when translating evidence-based research into practice in the real world, the latest being the focus of the IS analysis (Steckler & McLeroy, 2008; Damschroder & Hagedorn, 2011; Spiegelman, 2016). This distinction is important from a theoretical perspective but particularly relevant when designing, implementing and evaluating public policies. Several IS models and frameworks exist today, many of them applied to health interventions (Chadoir *et al.*, 2013; Moullin *et al.*, 2015). A common element in these models is the identification of key implementation elements, which usually correspond to features of the intervention provider, the intervention, the recipient, and the environment (Villalobos Dintrans *et al.*, 2019).

This study focuses on identifying enablers and barriers for the implementation of national-level COVID-19 guidelines

and protocols in LTCF. Following Villalobos Dintrans and Bossert (2017), we consider four implementation factors:

1. Goals: whether the intended results and mechanisms of the provider and recipient are aligned, and if they are aligned with the intervention's objective (e.g., do the providers and recipients share expectations on the intervention's outcome?).
2. Financial factors: whether resource constraints can explain the ability to implement the intervention as intended (e.g., do the providers and recipients have enough resources to implement and sustain the intervention as intended?)
3. Technical requirements: whether the technical needs of the intervention match the technical capacities of the institutions involved in the project (e.g., do the providers and recipients have the required training and skills to carry out the intervention as designed?).
4. Culture: whether the usual way to carry on the activities in the institutions' conflicts with the proposed changes (e.g., does the intervention require changing the organization's structure? Can this generate conflicts between different stakeholders?).

red). The intervention in this case is the official COVID-19 guidelines and protocols issued by the government, as described in SENAMA (2020). The intervention providers are the Ministry of Health and the National Elderly Office. The recipients of the intervention—the target population—are authorized LTCF in the country.

Study design

We draw on a mixed methods design based both on a quantitative survey to managers of LTCF and qualitative semi-structured interviews to LTCF staff. This approach intends to draw complementary data from relevant actors. Managers are required to gather and report quantitative data regarding cases and prevention measures of their facilities. Therefore, the survey allowed us to contextualize findings, assess the implementation degree of the COVID-19 measures (e.g., staff replacement), and to compare enablers and barriers (e.g., PPE availability) across different institutions and levels. Also, we aimed to enrich this data by drawing on data from staff using a qualitative approach which allows us to identify previously unknown organizational-level enablers and barriers among the ultimate implementers (i.e., the staff). Finally, although interviews to managers were not conducted due to time constraints, an open box to describe unmentioned barriers was included in the survey to check for relevant themes not mentioned by careers. Yet, no new enablers/barriers emerge using this strategy.

Figure 1 shows the framework we used to identify enablers and barriers for implementation. We focused on the interaction between two implementation elements (in blue): intervention and recipient (Chambers *et al.*, 2013), looking at the four implementation factors (in

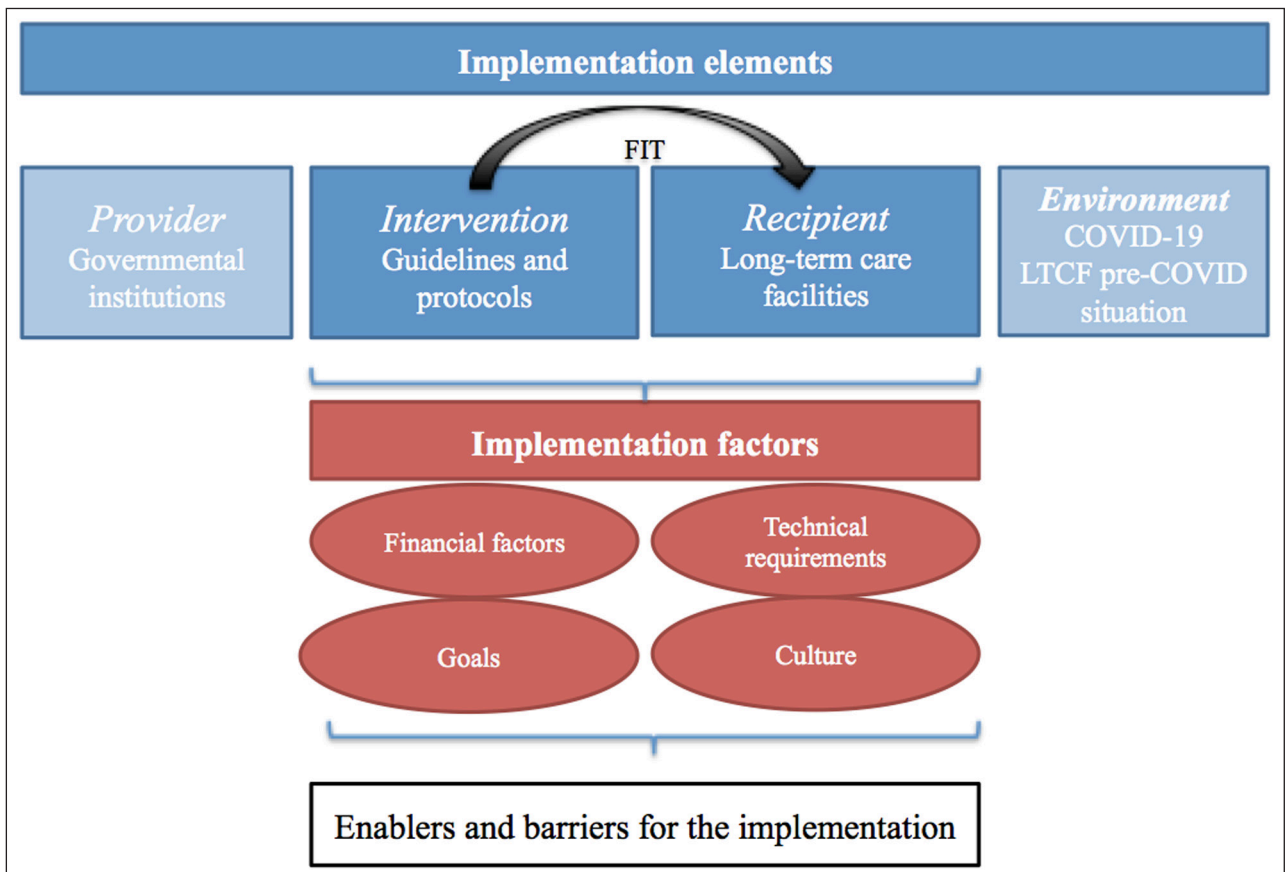


Figure 1: Implementation elements and factors considered in the study.

Data collection

Sample

While the recipient of the intervention — LTCF — is clearly identified, two different actors, LTCF's managers and staff, implement the government's intervention within each facility.

We sampled managers and caregivers from LTCFs in three regions of the country (Metropolitana, Libertador General Bernardo O'Higgins, and Valparaíso). Selected LTCFs belong to "Hogar de Cristo" and "Fundación las Rosas" the two largest non-profit LTCF providers in Chile. Together, these providers run 41 nursing homes with 2,770 residents, accounting for almost 30% of all residents in non-profit institutions in the country. All of "Hogar de Cristo" and "Fundación las Rosas" facilities have health professionals (a nurse, physiotherapist and/or physician) and independent technical support on location.

The sampling strategy was designed to cover a variety of contexts and the way COVID-19 responses were implemented. We sent a quantitative online survey to all of these LTCF's managers ($n = 41$), providing us the ability to collect data quickly so that findings might be useful to those engaged in confronting the virus and its impact. Additionally, in order to complement the survey data, we selected four of these LTCFs and conducted two semi-structured interviews with staff on each one ($n = 8$). This qualitative component offered us the possibility of identifying emerging themes and exploring potential differences between manager reports and practice in the LTCF. The qualitative subsample was purposely selected to cover LTCFs in the three regions, as well as facilities with COVID-19 outbreaks: at the time of interview, two LTCFs had past and two had ongoing COVID-19 outbreaks; two LTCFs were drawn from the Región Metropolitana, one from Valparaíso and one from Libertador General Bernardo O'Higgins. In each of the four selected LTCF, the administrator provided the contact of the staff to be interviewed. The subsample was not designed to be representative of LTCF staff but to cover the variability in the experiences of the population of LTCF staff (Patton, 2002). All participating staff were women; all but one of the participating staff are Chilean. The eight respondents from the four LTCF provide saturation coverage.

Instruments

Survey questions probed the barriers and enablers using the previously described implementation factors (goals, financial factors, technical requirements, and culture). The survey was divided into two parts: one asking about prevention measures and other with questions on control measures, both parts had the exact same questions (see Supplementary Material 1). The survey was carried out between July 10–21, 2020. The response rate was 88% (36 out of 41).

The eight semi-structured interviews were also carried out during July 2020. Interview questions followed the same guideline to assess barriers along the four IS factors (see Supplementary material 2). Five of the study authors carried out the interviews by phone. Interviews lasted around 40 minutes on average, were audio recorded (under

participants' consent) and were transcribed verbatim. We pre-tested the instrument by applying it to a member of staff in the same conditions planned for the selected sample. The pre-test allowed us to verify that appropriate questions were being asked and that questions did not make respondents uncomfortable and/or confused (Hurst *et al.*, 2015). After each interview, and following standards in qualitative research, each interviewer collected field notes and shared them with the other authors. Notes included a critical reflection on how the details of the interview process and the important issues arising during the conversation (Phillippi & Lauderdale, 2018).

Data analysis

Quantitative data was analyzed with R, while a thematic analysis was used to look at the qualitative data collaboratively (Braun and Clark, 2012). First, all transcriptions and field notes were clustered and analyzed using the four IS factors (goals, financial factors, technical requirements and culture). Then, data was studied within each factor, identifying relevant themes and sub-themes and classified each quote accordingly. Following Graneheim and Lundman (2004), and in order to increase the validity of the analysis, more than one author participated in each stage, discussing results to obtain consensus. We present the qualitative and quantitative findings simultaneously, in accordance with a mixed methods approach and in recognition of the complementarity of the two approaches.

Results

Findings are presented according to the four implementation factors, highlighting the enablers and barriers that both managers and staff identify in relation to each factor. As managers differ in their assessment of implementing prevention and management measures (11% report that implementing prevention measures is not possible, while this figure reached 19% for control measures), information is presented separately for each type of measure.

Enablers and barriers to implementation

We identify different elements within each implementation factor that could be classified as barriers or enablers to implementation (**Table 1**). Managers and staff report similar barriers and enablers, yet staff and managers provided different insights for the same implementation factor (e.g., human capital: quality and quantity). **Table 1** summarizes the enablers and barriers identified in each factor, noting whether it was identified by managers (MG) or staff (ST).

Goals

Regarding the alignment of goals between the provider, intervention, and recipients, the survey shows that 80.6% and 75.0% of managers have a high degree of knowledge of COVID-19 prevention (e.g., PPE use and disinfection) and control (e.g., setting an isolation area) measures, respectively. Most managers report that they agree or strongly agree with the prevention measures (94.6%) and control measures (97.2%) in the guidelines and protocols.

Table 1: Summary of enablers and barriers for the implementation of the COVID-19 guidelines and protocols in LTCF in Chile.

Implementation factors	Enablers	Barriers
Goals	Knowledge of measures [MG, ST] Fear and uncertainty [ST] Common purpose: concern for older people [ST]	Top-down initiative [ST]
Resources	PPE availability [MG, ST] Human capital (quantity) [ST]	Infrastructure Human capital (quality) [ST] Human capital (quantity) [MG] Support to staff [ST]
Technical requirements	Message clear and easy to understand [MG, ST] Trust in LTCF administration/ technical staff [MG, ST] Availability of posters [ST]	Lack of first-hand information, interpretation [ST] Lack of supervision [ST]
Culture	Esprit de corps [ST]	Trust issues between different groups [ST] Resistance to change: emotional and practical factors [ST]

Note: MG: managers; ST: staff.

Similarly, staff report that interventions are important and accurate, indicating an adequate alignment between the goals of implementers and the measures proposed. Fear, uncertainty, and the burden of COVID-19 on LTCF residents, are strong incentives to adopt these measures. The fear of contracting the virus acts as an enabler to implement preventive measures. It motivates staff to implement these measures not only while at the LTCF, but also outside in public spaces or even at home:

“We are following these measures from day one, because we don’t know if there will be another outbreak. We need to do everything to protect older people and ourselves. The hardest thing is fear. Fear to be infected. Even when using the PPE [personal protective equipment]. Fear overcomes me.” (I1)

“The measures are OK. Anything to protect the grandpas is fine.” (I2)

Staff value the quick response from authorities regarding measures aimed at LTCF. They also report the need to contribute to the implementation of the measures; they acknowledge that it is both their and the clinical team’s responsibility to protect the residents and themselves. Staff accept the measures and implement them without questioning whether they are the most effective or efficient measures. They recognize that the measures are designed to protect older people and implement them as ordered.

“We have to believe this [the implementation of the preventive measures established in protocols] is the right way [to prevent and mitigate COVID-19].”

“We need to be careful, because we are the ones that go outside, not them [residents].” (I1)

Notwithstanding the enablers identified above, the origin of the protocols is unknown for staff, and rather

seen as a top-down measure. This can act as a barrier to implementation, for example, if the final implementer (staff) disagreed with the intervention and see it as imposed by the managers. The implementation issues can worsen if there are previous organizational problems, as engagement and partnership among the stakeholders involved in the intervention is key for its outcome (Stirman *et al.*, 2012).

“I think it was the nurse in charge of the residency who created the protocols, she made the protocol, and then she taught it to us.” (I3)

“I have no idea where they came from [the measures]. Perhaps they were done by the boss or someone else, but honestly I have no idea where they come from.” (I4)

Resources

PPE availability enables implementation. First, in terms of Personal Protective Equipment (PPE) availability, around 20% of managers identify PPE shortage (22.4% and 25% for prevention and control measures respectively). Staff also report PPE as a barrier to implementation, although some staff reported problems in accessing specific items. Staff also noted an increase in resources during the pandemic:

“We have been given all the PPE we need.” (I5)

“We changed our aprons every two older adults, because there weren’t that many. Now there are more supplies, and we change aprons and gloves.” (I6)

Only one participant commented that the LTCF did not provide POE and she had to pay for the equipment out of her own pocket:

“The goggles, those I had to buy them myself.” (I7)

Infrastructure was a key resource and was rarely capable to meet to the protocols' requirements. Many of the LTCF physical configurations are difficult to adapt to a pandemic situation, as they were not designed to be adaptable to emergencies of this magnitude. Half of the managers reported that their infrastructure was inadequate to implement the measures; staff made a similar assessment:

"We didn't have the infrastructure. As I told you, this is new for everyone." (I3)

"In architectural terms, it is not possible to add more bathrooms." (I5)

The survey shows that the most frequent barrier to implement the measures was staff availability for prevention (55.5%) and management measures (52.8%). Staff also identified human capital as one of the crucial issues in dealing with the pandemic and implementing the protocols. For staff, however, the critical issue is quality rather than availability. Though staff acknowledge the need to bring new staff to the LTCF, they criticize the lack of adequate training or experience among the newly recruited staff:

"They sent a lot of people, but they were not prepared to work here. They had no experience." (I3)

Additionally, participants report a lack of technical and psychological support for staff, a key aspect for LTCF staff (WHO, 2020). Staff resent this lack of support as they struggle both with the provision of services and the pandemic on a day-to-day basis, while also dealing with their own fears, and facing the fear and the real possibility of death of the older people they care about:

"I insist. There is a lack of support—psychological, pedagogical, training—for the staff." (I8)

Technical requirements

In general, participants declared that the guidelines and protocols were easy to understand. Managers report no barriers in understanding the prevention (100%) and control (96.8%) measures. However, practically no staff reported having seen the actual protocols (only one did). Staff got the information from posters and relied on LTCF managers and the technical staff indications. If protocols are unknown there can be problems with the intervention's fidelity, i.e., the degree to which an intervention is delivered as intended (Carroll *et al.*, 2007); changes in the way the intervention is implemented can reduce its benefits (Chambers *et al.*, 2013).

"Our boss, she is a nurse, and she knows a lot. We have an advantage there. She anticipates the facts. Something like that." (I2)

Both managers and staff valued the training. Around 60% of managers reported that staff had adequate training to implement the measures. Staff declared that training

was key to know what to do. However, there can be issues with the interpretation and the emphasis on a particular mention when trainers or managers are the sole source of information for prevention and control of COVID-19. As one of the interviewers noted:

"She [staff] listed all the prevention measures but couldn't say which was the most important (e.g., washing hands) and kept repeating others that were not in the guidelines (e.g., shoes sanitization)." (R1)

Another aspect of the technical requirements in implementing the guidelines and protocols is supervision. Careers acknowledge having received training on the protocols but highlight that there was few to null supervision on the actual implementation:

"They ask us to wash our hands, and they give us the equipment... but honestly, there is no much control." (I5)

Culture

Trust between staff and health professionals working at the LTCF can affect the effectiveness of the intervention:

"The professionals told us there were respiratory problems... but all those were also coronavirus symptoms... we were working with infected people and we didn't know." (I4)

Yet, the workplace environment was generally considered positive. Most managers reported that the staff agreed and/or strongly agreed with the prevention (94.4%) and management (91.7%) measures. Staff described the job and their colleagues in good terms, reinforcing the idea that they felt part of a group that shared a common goal (*esprit de corps*):

"We work together in a good working environment; here you feel good... we are a very bonded group and we support each other..." (I9)

However, personnel turnover during the outbreaks altered the perception of this good environment generating tension between the newly recruited staff and those with a longer tenure:

"The new ones. They came here knowing nothing about this..." (I3)

"The old staff, she has years of experience and old habits. She has her own way to do the job. And she wants to impose her style, the old way, and wants to pull down the new." (I3)

Finally, staff reported they were able to adapt their everyday life routines to the pandemic measures. However, they acknowledged that both the residents and the staff themselves struggled to comply with some of these

measures, showing resistance to change. There are socio-emotional (e.g., wanting to spend time and share a space with others) as well as practical factors (e.g., barriers for communication) explaining this struggle:

“They [some residents] gather anyway. They want to have lunch together, and we have to separate them.” (I5)

“Before, we shared more time with them [residents]. If someone asked for you, you went. Now, we can only see the residents we have assigned.” (I6)

“They [residents] ask me why I’m wearing a costume. They don’t understand why we should use a mask if there is nothing wrong with them. It makes them feel bad.” (I5)

“Using the face mask was difficult, because it gives you a feeling of suffocation.” (I3).

Discussion

Most of the previous assessments of LTCF and the implementation of guidelines and protocols in the context of COVID-19 have focused on one specific dimension of the implementation. Usually, studies focus on resources and technical issues (e.g., training). Indeed, staff, infrastructure and PPE availability had been identified as key elements in other settings (WHO, 2020; Comas-Herrera *et al.*, 2020c). However, the research has neglected key dimensions that influence effectiveness, such as the alignment of the measures with the implementer’s goals and cultural issues. Our study shows the relevance of IS to guide and evaluate the implementation of COVID-19 measures on LTCF in Chile and elsewhere: having good technical-quality protocols (efficacy) is important but will not ensure results on the field (effectiveness). By adopting a broader framework through IS, this study identified several implementation barriers (e.g., infrastructure, human capital and resistance to change) and enablers (e.g., PPE availability and trust in technical staff) that could facilitate or hinder the effectiveness of the measures proposed by the central government.

Unfortunately, in Chile, to date there is no publicly available data to assess the mortality impact of COVID-19 in LTCF. However, a recent report suggests that by November 2020 the LTCF residents of this country experienced a 2.2% lower mortality than predicted when compared with countries with LTCF mortality data (Singer, 2020). This study suggests that these positive results could be related to the mitigation strategy of SENAMA (face-to-face technical support, PPE supply, staff replacement, field testing with rt-PCR, and the temporary transfer of COVID-19 residents to sanitary houses) plus the interventions from the MoH. Furthermore, the author highlights a “strategic orchestration” between private companies, the state, and civil society as a key component for the implementation of the COVID-19 strategy in LTCF. Our findings are aligned in this aspect. We found several enablers for sharing mutual goals including knowledge of measures and a common purpose: concern for older people. Enablers for this key implementation factor could have been accomplished through fluid dialogue between actors who participated

in LTCF COVID-19 working committees (Browne *et al.*, 2020). Additionally, enablers such as PPE availability and quantity of human capital plus the availability of technical staff in the resources and technical requirements could have provided the conditions for adequate implementation of prevention and mitigations strategies. This is relevant because the health-related culture is necessarily rooted in LTCF as a significant proportion of managers and administrative staff come from social-related backgrounds. Hence, the availability of technical staff in place could have accomplished a key role in translating health-based protocols to the rest of the staff.

Unfortunately, in the context of scarce publicly available data on the impact of COVID-19 in LTCF, establishing causal relations is not possible. Consequently, the degree to which several of the identified barriers hindered the effectiveness of the interventions remains uncertain. However, this does not mean that results cannot be used to inform future COVID-19 and other crisis response policies in Chile and other countries. Notably, both managers and staff recognize human capital as a critical element for implementation. While managers identified staff availability as a barrier, for staff the main issue is quality, noting that the lack of experience and training of newly recruited staff acted as a barrier for implementing the proposed measures. Other barriers such as lack of supervision and infrastructure are expected to have a direct negative impact over implementation but with heterogeneous effects between facilities. Despite these uncertainties, strategies to overcome several (but not all) the identified barriers are feasible to implement. For example, funding free access and high-quality short training for staff could decrease quality gaps in human capital. Furthermore, promoting spaces for expressing difficulties between working staff could improve trust issues between different groups. Also, protocols could be adapted and delivered to careers and non-clinical staff in other prevent misinterpreting measures. Finally, psychological support to staff could be considered as a key missing resource factor where evidence-based approaches have been proposed (Embregts *et al.*, 2020). On the contrary, barriers such as infrastructure will probably need deeper understanding of the needs in order to provide long term solutions. Lastly, we believe such uncertainty over how much a barrier hinders the implementations should not stop finding policy solutions to overcome barriers that may have straightforward or even feasible evidence-based solutions.

Though the study is carried out in the specific context of Chile, the LTCFs analyzed in this study illustrate the relevance of identifying all the elements involved in the intervention. This means acknowledging the existence of two levels in which the intervention is adopted by a LTCF, and the different roles played by managers and staff. Results also emphasize the usefulness of using a mixed methods approach to analyze the problem, particularly with different actors involved in the process of implementation. On the one hand, we quantify and collect standardized information from managers through the survey. Through the semi-structured interviews, staff identified several

key aspects of the implementation based on their daily experience working at the LTCF. As far as we understand some of these aspects, such as trust issues between different groups, are not frequently described nor assessed in COVID-19 prevention and control guidelines, highlighting the usefulness of qualitative approaches for these purposes.

We acknowledge some limitations of our study. While interpreting the results it is important to consider external validity, which is limited in both scope and time. First, the sample included managers and staff from 41 LTCFs owned by two non-profit LTCF providers. Although they are important players in institutional care in Chile, the situation described in these LTCF might be different to those observed in other facilities. Size, resources availability of medical staff on-site, type of administration, and institutional culture vary across providers and may influence the results. Second, the analysis is constrained to a specific period of time. The COVID-19 pandemic has shown to be complex and dynamic. Consequently, managers' reports and staff perceptions are influenced by the moment and experiences lived by the time the survey and the interviews were carried out. For this reason, some of the findings of this study might not hold in time.

Finally, in terms of policy implications, we extract several lessons. First, we highlight the importance of building networks between the different players involved in the work of LTCFs. Peoples' responses show that trust in administrative and technical staff, as well as the previous relationship established between the national and local level institutions, was key for a quick communication and implementation of the guidelines and protocols. Second, we acknowledge again the relevance of designing interventions not only technically correct but also feasible to implement for the intended target population (e.g., resources available and infrastructure requirements). Also, from a psychological perspective, understanding people's resistance to change and their limits in terms of implementing measures that goes against their goals and culture. Third, human capital is a key issue, but it is not restricted to staff availability. Having a network of well-trained staff is key and implies moving towards policies to train but also certify old and new staff. Finally, the analysis was focused on understanding the core elements of the intervention, leaving aside the importance of pre- and post-intervention components (Villalobos Dintrans *et al.*, 2019). The design of new policies benefits from better pre-intervention (e.g., how many LTCFs are in the country? Where are they? What are their conditions?) and post-intervention actions (monitoring and evaluation of the measures) in order to generate effective improvement to LTCF residents and their staff.

Conclusions

The results highlight the usefulness of using an IS approach to design and evaluate the implementation of interventions in LTCFs. The study uses the COVID-19 measures in Chile as an example, but the recommenda-

tion can be generalized to design and evaluate intervention in different contexts.

Data Accessibility Statement

The datasets and interviews used and analyzed during the current study are available from the corresponding author on reasonable request.

Abbreviations

IS: Implementation Science

LTCF: long-term care facilities

MG: managers

MoH: Ministry of Health

OP: Older people

PPE: Personal Protective Equipment

SENAMA: National Service for Older People (*Servicio Nacional de Personas Mayores*)

SGGCh: Chilean Geriatrics and Gerontology Society

ST: Staff WHO: World Health Organization

Additional Files

The additional files for this article can be found as follows:

- **Supplementary Material 1:** Questionnaire to managers. DOI: <https://doi.org/10.31389/jltc.72.s1>
- **Supplementary Material 2:** Interview guideline for staff. DOI: <https://doi.org/10.31389/jltc.72.s2>

Ethics and Consent

The Ethics Review Board of the Pontificia Universidad Católica de Chile approved the study design, instruments and methods (Res.# 012321).

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Competing Interests

The authors have no competing interests to declare.

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