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Role and challenges to digital technologies in community health promotion programs in Italy during the COVID-19 pandemic: a multiple embedded case study protocol

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Abstract. *Background and aim:* Due to the COVID-19 pandemics, The Italian League Against Cancer (LILT), a national federation of local associations promoting cancer prevention, had to face the challenge to find new ways and technologies to promote health in their territories. This study aims to explore how LILT associations led their health promotion interventions during the COVID-19 pandemic and to understand which interventions had a greater impact, for which population group, and why. *Methods:* In this descriptive multiple embedded case study, each case will focus on the activities of a local LILT association and their collaborators on the perception and experience of the use of digital technology for health promotion and prevention, through interviews, observations, and a study of products and artifacts. A general overview of each case study will be provided, along with an introduction of the unit(s) of more in-depth analysis. The logical models that emerge from the analysis of each case will be described by using realist analysis, producing a list of possible CMO configurations (Context; Mechanisms; Outcomes). The final report will consist of a cross-case analysis (a comparison between the different case studies). *Discussion:* This multiple case study will help generate a first theory of the use of digital technology in health promotion in local LILT communities. The observation of what local LILT associations in Italy have done during COVID-19 will help identify new and useful health promotion strategies based on these technologies. (www.actabiomedica.it)

Key words: digital health; health promotion; cancer prevention; multiple case study; protocol

Introduction

Since early 2020, the COVID-19 pandemic has had a massive impact on people's health and wellbeing and has posed crucial challenges to national health services (1). One of the fields that has been affected the most is cancer screening, especially in the early phases of the pandemic. Although it is widely known that cancer screening programs can decrease specific-cause mortality and all-cause mortality (up to 20% and 3%, respectively) (2) and may have an important role in helping to identify early-stage cancers, the proportion of eligible individuals screened for different types of cancer dropped 62–96% in April-May of 2020

compared to April-September 2019, in the USA (3). In fact, due to the disruption of health services caused by COVID-19, an estimated 9.4 million screening tests that normally would have taken place in the United States in 2020 didn't happen (4). A similar situation was observed in Italy, where the COVID-19 pandemic led to a national lockdown in March 2020 and the temporary interruption of several non-urgent healthcare activities, including cancer screening (5,6).

The Italian Cancer League (LILT), a national federation of local associations promoting cancer prevention through awareness campaigns, educational programs for schools and early diagnosis programs, had to face the challenge to find new ways including new technologies to promote health in their territories. Digital health promotion was already a growing field, but the nature of services as non-profits makes it difficult to produce a strict guide line on this field, while a "case study" approach might help in define good practices that can be adapted to each individual specific situation (7).

In this project, whose short name is "5x1000 Community" we will collect the experiences of health promotion through digital technologies had by local LILTs (in the form of "case studies") and, through a community of practices between LILT and other partners in this project. We will examine the approaches to implement or improve new practices (in the form of "action research"), in particular on the subject of smoking and the promotion of screening. As a community intervention, the partners and privileged targets are the local units, involved through training courses and community micro-projects. This protocol covers the study of the multiple case studies, while the action-research will be described in forthcoming papers.

The study

Aims

This study aims to explore how LILT associations led their health promotion interventions, especially in times of in-person meetings restrictions, with a specific focus on how they used digital instruments, and to understand which interventions had a greater impact, for which population group, and why.

Objectives

The study objectives of this project will be to:

- understand how the LILTs of the local sections participating in the project used digital technology in health promotion, starting from the onset of the COVID-19 pandemic;
- explore the tools and the new practices adopted by the local LILTs to conduct their work during the pandemic;
- assess the results achieved by the local LILTs by using digital technology, especially those which were not able to be achieved before the pandemic and those that would likely be adopted in the work practices

Methods

Design

This descriptive multiple embedded case study is designed according to the principles described by Yin (8). A case study design is appropriate to investigate 'how, what and why' a phenomenon takes place, and specifically suits contemporary, real-world events that are influenced by context (8). In particular, a multiple case study can increase reliability by contemporarily examining different cases instead of analysing one single unit (9). In this study different local LILT associations will be directly involved, each representing a different study case; this will allow reporting and analysing several interventions, and every unit of analysis will be embedded in the case study. In Italy, there are 106 Local LILT Associations, that vary depending on the geographical area, the population, and its needs: this is why we have chosen this research design, which seems appropriate according to the contextual variations. Analysing the differences between the study cases and their units will help to explain why some cases

have certain results and to compare and contrast results between units.

Definition of the case

Case studies have been defined in many ways (10) but generally share some common features. A case can be represented either by individuals, roles, or communities; it always occurs in a specific social and physical context, and it is therefore defined as the unit of focus being analysed and limited by specified boundaries (9,11).

For this study, a case is defined as the set of health promotion operators and primary care professionals involved in digital health promotion programmes led by each of the seven local LILT associations involved in the project.

LILTs are local associations with the aim of fighting cancer in terms of research and primary, secondary, and tertiary prevention: within each local LILT association primary health care professionals (medical doctors, nurses, psychologists, etc.) and volunteers are involved in the activities. Each LILT association carries on many different activities such as cancer screening promotion, online/in presence education (e.g., in schools or working environment), diagnostic exams and rehabilitation programmes.

Our cases will be bound by time and setting, as suggested by Creswell and colleagues (12) as case boundaries help focus the study questions and differentiate between the phenomenon under study and its context (8).

The time period for this study is represented by the period that followed the onset of the COVID-19 pandemic, as the main aims focus on the tools, the strategies, and the solutions adopted by the local LILT associations to carry on their activities (and to assess and monitor their results) during the COVID-19 pandemic (January 2020), to a conventionally decided July 2022. The project is articulated in four semesters: the case studies data collection will be conducted during the first semester, while the second and third semesters will be used for the evaluation of the processes analysed and during the first phase. The last semester will involve final evaluations and final reports writing, as well as scientific dissemination.

With respect to the setting, this study will be bound by the LILT national network, and in particular the project will be conducted together with the participating seven local LILT associations (LILT of Reggio Emilia, Piacenza, Ferrara, Firenze, Oristano, Campobasso, BAT).

Participants

The project management staff (principal investigator and project manager) will organize the data collection and perform the analyses. Each case (within a local LILT association) will be managed by a dedicated research team, formed by some members of the other LILTs and other project partners, in particular medical residents and master's students that will have hours formally assigned to the project through institutional agreements.

Participation will involve many different health promotion and disease prevention actors with local LILT associations, each having a specific role, however the LILT operators will both act as part of case studies and researchers, their activities being the main focus of the project

Data collection instruments

Data collection will be based on triangulation of:

- semi-structured interviews (see additional file 1 for an interview guide provided to researchers),
- participant/non-participant observation,
- analysis of materials such as website and social media contents produced during their activities.

An operational guide, including a description of what a "case study research" is, how to gather data and how to analyse them has been provided to all the professionals involved in the project. A possible outline for semi-structured interviews and a list of relevant points on how to conduct an observation were included. The interview outline is reported in a translated version in the additional file n.1.

Procedure

The subjects involved in the units of analysis of the case studies will be observed directly (when possible)

or indirectly (by watching and analysing the records of their activities) while conducting those activities that involve the use of digital technology for health promotion and prevention, and then interviewed by the project coordination staff members or by other LILT operators, previously trained. LILT operators and coordination staff members will be helped by primary care professionals (e.g. nurses) and university partners (medical residents in preventive medicine and public health, medical residents in community care, master students) in conducting the interviews, recording the activities conducted by each participating local LILT association, producing reports, minutes, manuals, and assessing whether there are new practices involving digital technologies that have been put in place and could be considered "good practices" to be exported in other settings (e.g. in other local LILTs or promoted as a national model).

Reports, recordings, videos, and other materials that were produced in the pandemic period by any of the participating local LILT associations will be analysed.

To optimize resources, it was decided to investigate only a few "units of analysis" (subunits that form a case study) for each LILT. Each LILT has independently indicated (via email and/or interviews with the management staff) which aspects of their activities they wanted to describe in detail.

As previously reported, the operators of a LILT will also collaborate in the data collection of the other local LILTs' units of analysis ("peer-research"): in this way they will develop research skills in a protected environment and also have the opportunity to learn more in depth the work of the other sections on the area of interest of the project. This exchange of working practices aims to support the creation of a real "community of practices", an expected product of the project as a whole.

Data analysis and reporting

Analysis and reporting will be likely divided into two main parts:

- individual case studies: a general overview of the case study will be provided, along with an introduction of the unit or units of more in-depth analysis (e.g. "LILT-Reggio Emilia identified five areas in which the role of digital tools had a relevant role in conducting different activities [...]; of these, we analyse in detail three of them [...]"). A visual summary (e.g. a short video) will be provided, in order to allow a first immediate understanding of the outlines of the results of each case. Furthermore, according to the realist theory, the logical models emerged from the analysis of the case will be reported and will describe the case by using the CMO configurations (Context; Mechanisms; Outcomes) (13). These configurations will be presented with tables and summarised using a diagram.
- integrated multiple case study report: an overall report of the entire multiple case study will be prepared as a result of a cross-case analysis (e.g. comparison between the different case studies). In particular, this report will include a brief visual summary of the main "lessons learned" and will be based on one side on the comparison between the different "CMO" configurations found in each case, on the other side on the identification of more or less repeated patterns and the formulation of possible theories behind them. The multiple case study report will help generate a first "theory of the use of digital in health promotion in local LILT communities", which will then be deepened and refined through the second phase of the research (research-action).

Rigour

In order to increase credibility, consistency, and confirmability of our findings (14) we will apply the following strategies: semi-structured interview models will be created that will include a form of member-checking through restating or summarizing participant responses to ensure accurate understanding (14). Two or more strategies will be applied in every unit of analysis in order to triangulate the findings (15). As this multiple case includes different local case teams, triangulation will also be achieved with cross-case interviews that teams will conduct interviewing the other teams. As the multiple case

involve operators interviewing colleagues, this peer examination will also increase credibility and dependability, also considering that the research team is also formed by both operators and researchers.

Discussion

This study aims to provide an in-depth analysis of the rapidly evolving world of the digital tools and strategies used by local associations involved in health promotion and prevention.

Digital interventions are now often considered as an essential part of a community health promotion campaigns: they are used to better understand factors influencing compliance, to improve people's knowledge and education about cancer and cancer screenings, to reduce barriers that limit participation and reach different communities. This project will help understand which tools have been used by seven local LILT associations in Italy, assess their impact and results, and understand whether some tools or strategies can be helpful and therefore adopted in other settings in the future.

Different strategies to collect the data (interviews, direct and indirect observations of the activities) will then support thorough and diversified discussions of the observed phenomena.

This study will present several limitations, mainly due to its design. First, it will have specific boundaries in terms of context (time and setting): while this helps better define the cases and identify a logical framework of research and action, it will probably limit the generalizability of the results (as typical of case studies). Moreover, the inductive approach that will be used to analyse the data and draw conclusions (or build new hypotheses) is sometimes considered less rigorous and therefore producing less solid results; however, it must be said that this approach does not limit the researcher from using existing theories, and this may help formulate new hypotheses that can act as guide.

Conclusions

The COVID-19 pandemic forced many different healthcare organizations and professionals to reorganize their activities and posed new challenges and barriers that made it harder to achieve good especially in terms of cancer screening compliance. Therefore, the observation of what local LILT associations in Italy have done to overcome these barriers and the contextual analysis of which digital intervention was effective (and why) could help identify new strategies to support health promotion and public health in the future. This knowledge will indeed support decision-making in relation to funding, resource allocation and organization not only for local associations but possibly at a regional/national level.

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APPENDIX A

Supplementary file

Interview outline:

the interview outline has been developed according to the suggestions provided by the "RAMESES project":

https://www.ramesesproject.org/media/RAMESES_II_Realist_interviewing.pdf

https://www.ramesesproject.org/media/RAMESES_II_Realist_interviewing_starter_questions.pdf

(links retrieved December 19, 2022).

Introduction:

the interviewer introduces himself.

He clarifies that the interview will be recorded for research purposes and obtains oral consent to record and report what emerged from the interview as aggregated data, combined with what emerges from the other interviews.

He briefly explains the meaning of the research: "the ongoing research is linked to the "5x1000 Community Project" and intends to collect, in this first phase, the experiences made by the LILTs (Italian Leagues Against Cancer) with the use of digital technology in health promotion. In particular, today I would like to collect your experience on the topic [... declare the topic of the unit of analysis you are investigating, for example: LILT's experience with the schools of Reggio Emilia]".

Icebreaker:

Could you say three words that you would connect to your experience, as LILT, with the use of digital instruments?

Opening questions:

How would you define your role in the experience we are talking about?

What other people were involved?

Can you describe to me how this experience was organized, in general?

Central questions:

How would you define the results achieved from your point of view?

Were some of the results measured in some way? How? Was a formal assessment done?

How was this experience perceived by users?

Were there any types of users for which it worked more or less?

What aspects worked the most in this experience?

What allowed or helped the achievement of these aspects that worked better ("facilitating" elements)?

What worked less?

What obstacles you found that led to these aspects that have worked less ("barriers")?

In which contexts do you think this intervention could work better?

What lessons do you think this experience has taught you?

What materials were produced in this experience? Is it possible to view them?

Which other people do you find useful or relevant to be interviewed to get a complete picture of this experience?

Conclusion:

I try to make a very quick summary of what has been said: […]. Can you think of anything else to add?

"Thanks for your kind participation, you and your staff will be involved in future progress of this project, as we'll be asking you feedbacks as we progress in collecting the case studies and writing them down."