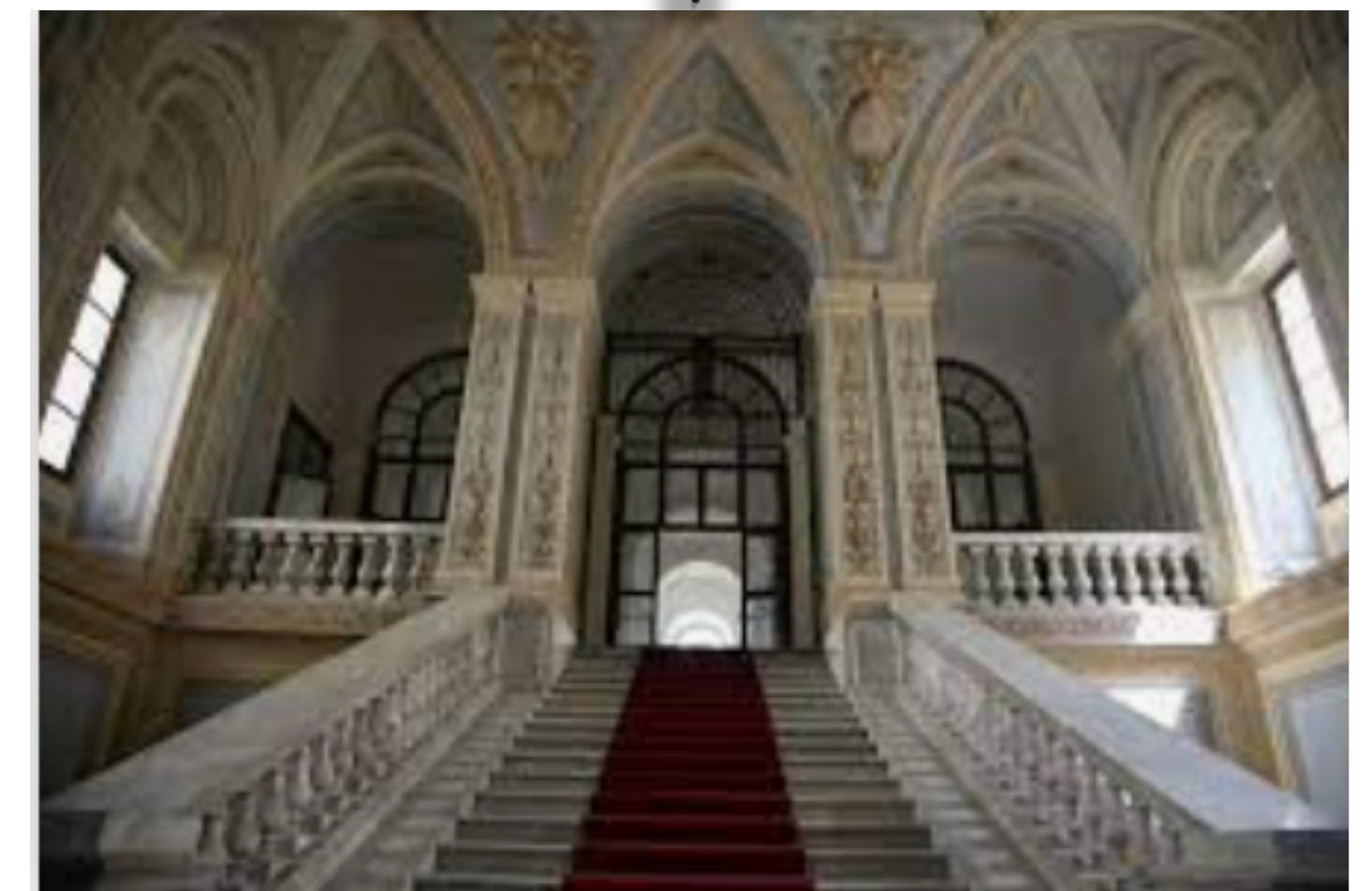


**“A competency model for obesity prevention and
healthy lifestyles education
through the interdisciplinary and sustainable paradigm of Telemedicine”**

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The project: *concept and overview*

Within the **Interdepartmental Research Center in Telemedicine Citel-University of Bari**, as UR “E-health education and wellbeing”, we have hypothesized a multi/transdisciplinary study, to grasp the transition processes towards the phenomenon of obesity and reduce the gap between scientific knowledge and lifestyles

Purpose of the study:

- experimenting in a multi-specialist team with advanced AI-based digital applications of telemedicine clinical protocols for the diagnosis, treatment and education of children with obesity or at risk of obesity
- identify an 'educational space' r the development of an empowerment-base model to empower people to manage health and quality of life balance



DIMO

UNITÀ DI RICERCA "TELEMEDICINA GENERALE E SANITÀ DIGITALE"



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UNITÀ DI RICERCA "UNITÀ SERVIZI DI FORMAZIONE E VALUTAZIONE IN TELEMEDICINA"

UNITÀ DI RICERCA "E-LEARNING E PROMOZIONE DELLA SALUTE"



DIP BIOSCIENZE, BIOTECNOLOGIE E BIOFARMACEUTICA

UNITÀ DI RICERCA "BIOSCIENZE E BIOTECNOLOGIE PER LA TELEMEDICINA"



DIP DI INFORMATICA

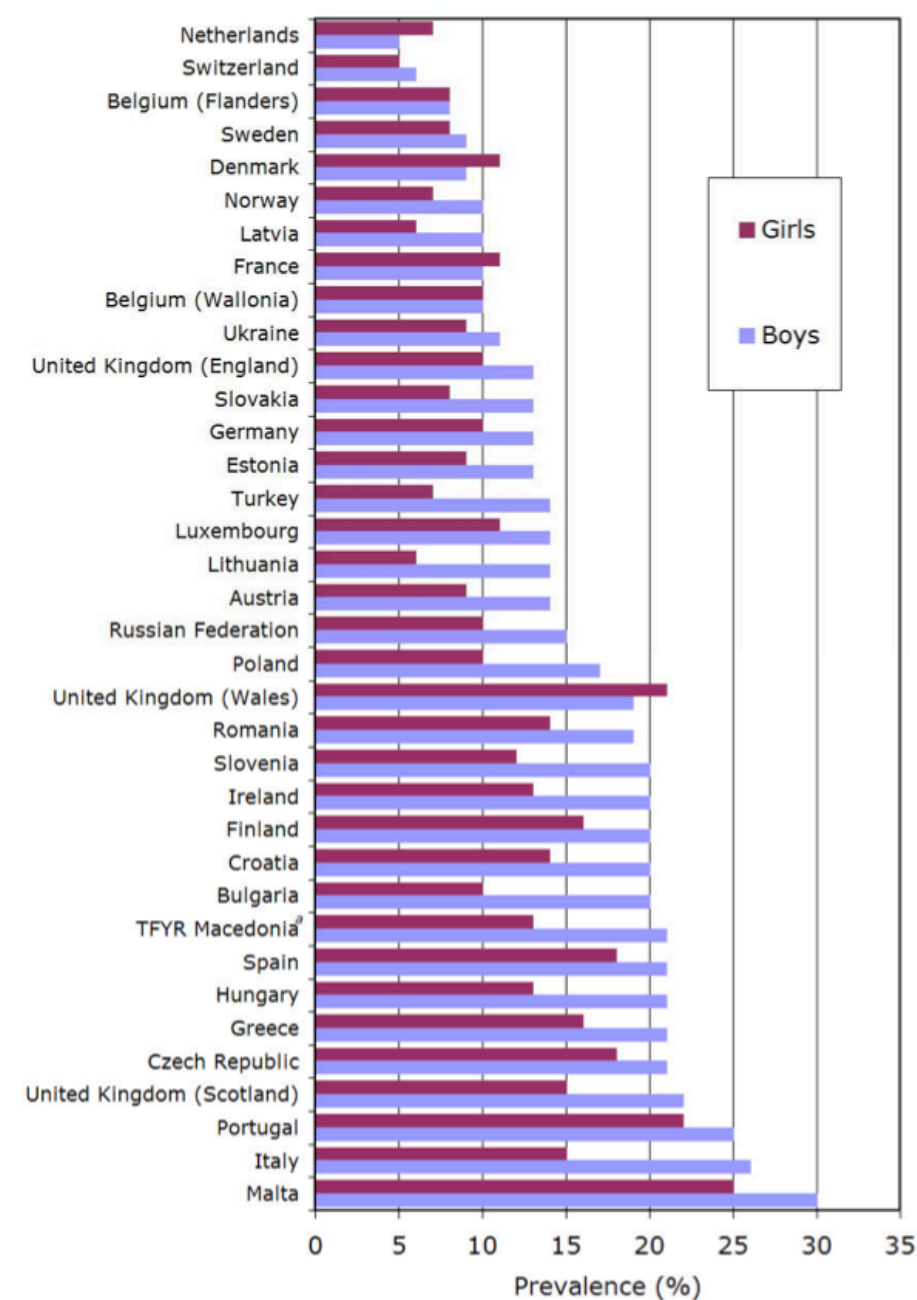
UNITÀ DI RICERCA "ARTIFICIAL INTELLIGENCE-BASED EHEALTH"

UNITÀ DI RICERCA "UNITÀ DI BIGDATA E DATA SCIENCE"

UNITÀ DI RICERCA "UNITÀ DI SISTEMI INTELLIGENTI E SICURI PER LA TELEMEDICINA"

Why Obesity? Background

Fig. 1. Prevalence of overweight (including obesity) among 11-year-olds in 36 countries and areas of the WHO European Region, 2005/2006



OBESITY, A DISEASE WITH A STRONG CLINICAL AND SOCIAL IMPACT

- In Italy, 1 in 4 children are overweight and 46% of the adult population is overweight or obese
- Obesity represents a disease in itself and a risk factor for major chronic diseases (heart disease, stroke, cancer, diabetes and chronic respiratory diseases)
- There are high percentage of children with obesity and few specialized care centers
- Excess weight is a highly significant predictor of the development of complications from COVID-19, including the need for hospitalization, intensive care and ventilation
- Other respiratory viral infections are aggravated by the condition of excess overweight and obesity. Data on the impact of Middle East respiratory syndrome (MERS), influenza H1N1 and other influenza-related infections show worse outcomes when in the presence of excess weight.
- Lower response to vaccines for Covid-19 and influenza of subjects with obesity
- Obesity represents an illness with psychological correlates (unsatisfactory body image, depressive and anxious symptoms, eating disorders, low self-esteem)
- Prejudice and social and media stigmatization of people with obesity (bullying, weight bias, fat shaming)
- The percentage of overweight citizens is among the 12 well-being and sustainability indicators that have become part of the government's economic policy planning cycle and in the statistics that monitor progress towards the SDGs obesity is included among the indicators Objective 2

SOURCES:

IBDO (2020), 2ND ITALIAN BAROMETER REPORT.

[HTTPS://WWW.WHO.INT/NEWS-ROOM/FACT-SHEETS/DETAIL/OBESITY-AND-OVERWEIGHT](https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight)

WORLD OBESITY FEDERATION (2021) "COVID-19 AND OBESITY: THE 2021 ATLAS. THE COST OF NOT ADDRESSING THE GLOBAL OBESITY CRISIS "

[HTTPS://WWW.EPICENTRO.ISS.IT/OBESITA/OBESITA-COVID-REPORT-WOF-2021](https://www.epicentro.iss.it/obesita/obesita-covid-report-wof-2021)

Theoretical framework

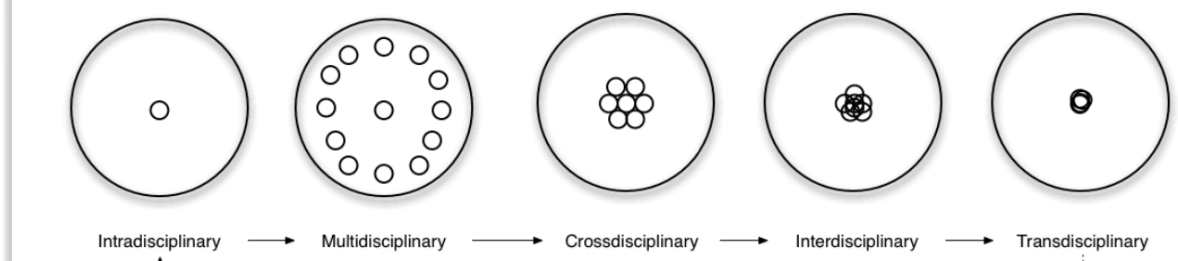
TRANSDISCIPLINARY PERSPECTIVES IN EDUCATION RESEARCH

The current covid-19 scenario has brought back to the attention the emergence of **complex problems**, defined by investing reality without being attributable to single units of analysis or interpretable through the perspective of single disciplines.

It recurs the *crisis of simple explanation*, the call to *complex thought* (Morin, 1977) and the revival of some epistemological paradigms for living the planetary destiny as **transdisciplinarity** (Bocchi, Ceruti, 1985), which represents an epistemological condition that claims the unity of the work domain and embodies the basis for *a new approach to inquiry aimed at radically grasping the complexity* of problems, taking into account the diversity of scientific and social visions of problems in order to constitute *knowledge with a focus on problem solving* for what is perceived as the common good.

Health emerges as a *complex problem*, no longer the domain of just medicine, being health at the centre of medicine, computer science, education, engeneering, etc. against reductionisms of the person identified in relation only to anatomical-functional dimensions and of the disease seen as a process of pure diagnosis-cure-healing

Trans keywords of problem solving:
problem - and solution oriented,
complexity, heterogeneity
participation of stakeholder,
users and decision makers
collaboration, cooperation,
partnership
negotiation, mutual learning,
joint problem solving
cross-disciplinarily, boundary
crossing, integrative, holistic



Fonte: www.arj.no/2012/03/12/disciplinarity-2, based on Ziegler (1990)

Premise

LESSON LEARNT FROM COVID-19

THE ENHANCEMENT OF PEOPLE'S PARTICIPATION/EMPOWERMENT IN HEALTHCARE AND IN THE MANAGEMENT OF HEALTH CRISES

The pandemic has exposed the weaknesses of the world's primary healthcare and community system in addressing the Covid-19 crisis, so now health policies put **community-building, social cohesion resilience and empowerment** at the top of the agenda, viewing well-being and participation as necessary to face global health and environmental crises.

The analysis of social and environmental factors in the transmission of Covid-19 (Lauriola P, Martín-Olmedo P, Leonardi GS, et al, 2021) highlights that the *promotion of better risk awareness and community-based preventives interventions* play a key role in clinical care, when integrated with hospital care and prevention departments.

In conclusion, it emerges as fundamental aspect to prepare for global risks and health challenges the search for innovative approaches for community well-being enhancing

- *multidisciplinary research approaches,*
- with strong support of *digital technology* and AI tools
- and with individual and community commitment in preventive practices *with the involvement/engagement of empowered citizens/patients*

The research context



E-HEALTH AND TELEMEDICINE: HEALTH GOVERNANCE BETWEEN DIGITAL INNOVATION AND CITIZEN/PATIENT'S EMPOWERMENT



At present the aging process of the population, the development of science in the medical field and the cultural and social evolution is pushing towards the definition of **patient-centred and AI-based models of assistance and provision of services in the health sector**, for a transition *from curative medicine to preventive, predictive, personalized and participatory medicine* in sustainable healthcare systems in which the patient will have an increasingly active role in the management of his health and the information necessary to make informed choices (Italian Health Minister, 2018).

E-health, as an application of ICT to health sector, represents an enabling tool to guarantee deterritorialization, accessibility of information and improvement of care paths while Telemedicine indicates apps and 'tracking devices' that allow health professionals to monitor, diagnose and treat patients remotely.

The health system becomes e-health, provided that the active role of the patient / citizen in the health system is redefined and it generates quality of life outputs as the achievement of satisfaction, well-being and personal happiness.

The effectiveness of the ongoing e-health system is based in fact on the ability to integrate current digital health innovation processes with inclusive trainings of: **patient engagement-involvement** (Barello et al., 2016); **patient empowerment** (Aujuloat, D'hoore, Deccache, 2007; Gibson, 1991; Risling et al. 2017), **construction of health literacy** (Conard, 2019) which becomes *critical health literacy* (de Wit et al., 2017), *digital health literacy* (EC, 2010) and *public health literacy* (Freedman et al., 2009)



The present study has therefore set the following objectives:

- carry out a clinical trial of telemedicine for the diagnosis, treatment and educational therapy of children with overweight or obesity through a digital platform
- design gamified applications and educational tools within Learning Management Systems in the medical area for taking care of children with overweight / obesity
- carry out data collection operations to define guidelines and best practices (e.g. diets) to be integrated into a citizens's health education model and a therapeutic patient education model
- promote continuing education and training courses for patients and families in terms of assuming responsibility / autonomy in the context of treatment and healthy lifestyles.
- ensuring a therapeutic-patient doctor alliance

KEY CHALLENGES OF THE STUDY: promoting life-long learning for health and wellbeing

- work on the design of a new transdisciplinary paradigm, **Virtual Patient Education**, in the context of telemedicine applications to improve health outcomes of the treatment and quality of life of the patients and families involved with experimentation of educational skills.
- developing a competency model for a healthy lifestyle through **health literacy promotion** in primary prevention contexts
- **connect the bio-medical approach and the pedagogical and didactic approach** to promote health and wellbeing in a salutogenic perspective of lifelong learning to guarantee healthy lifestyles

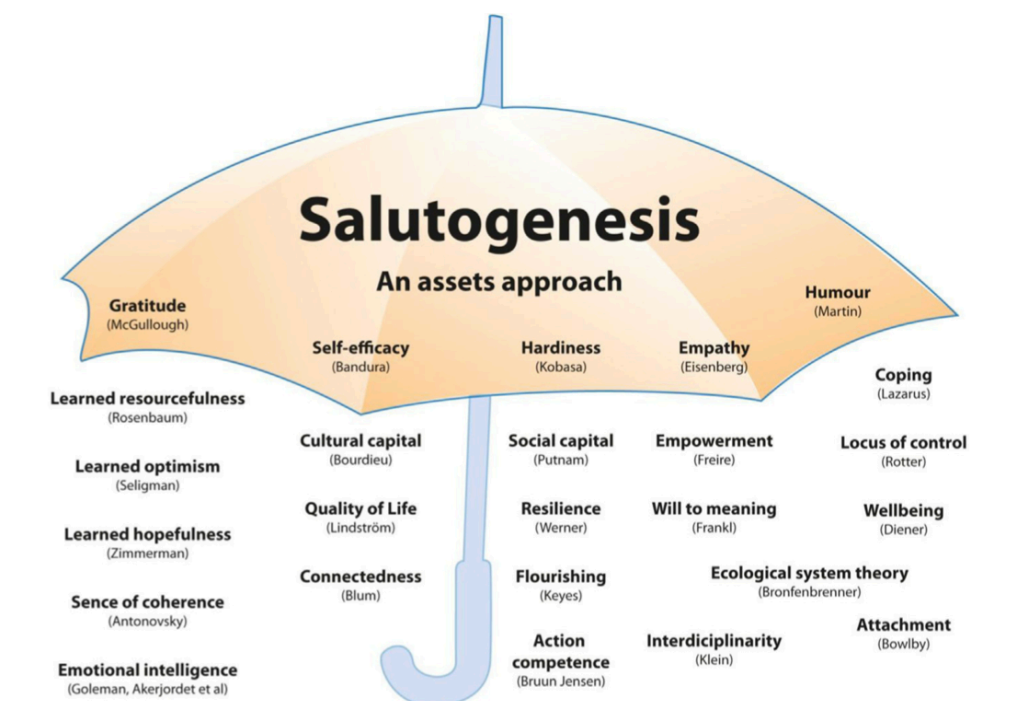
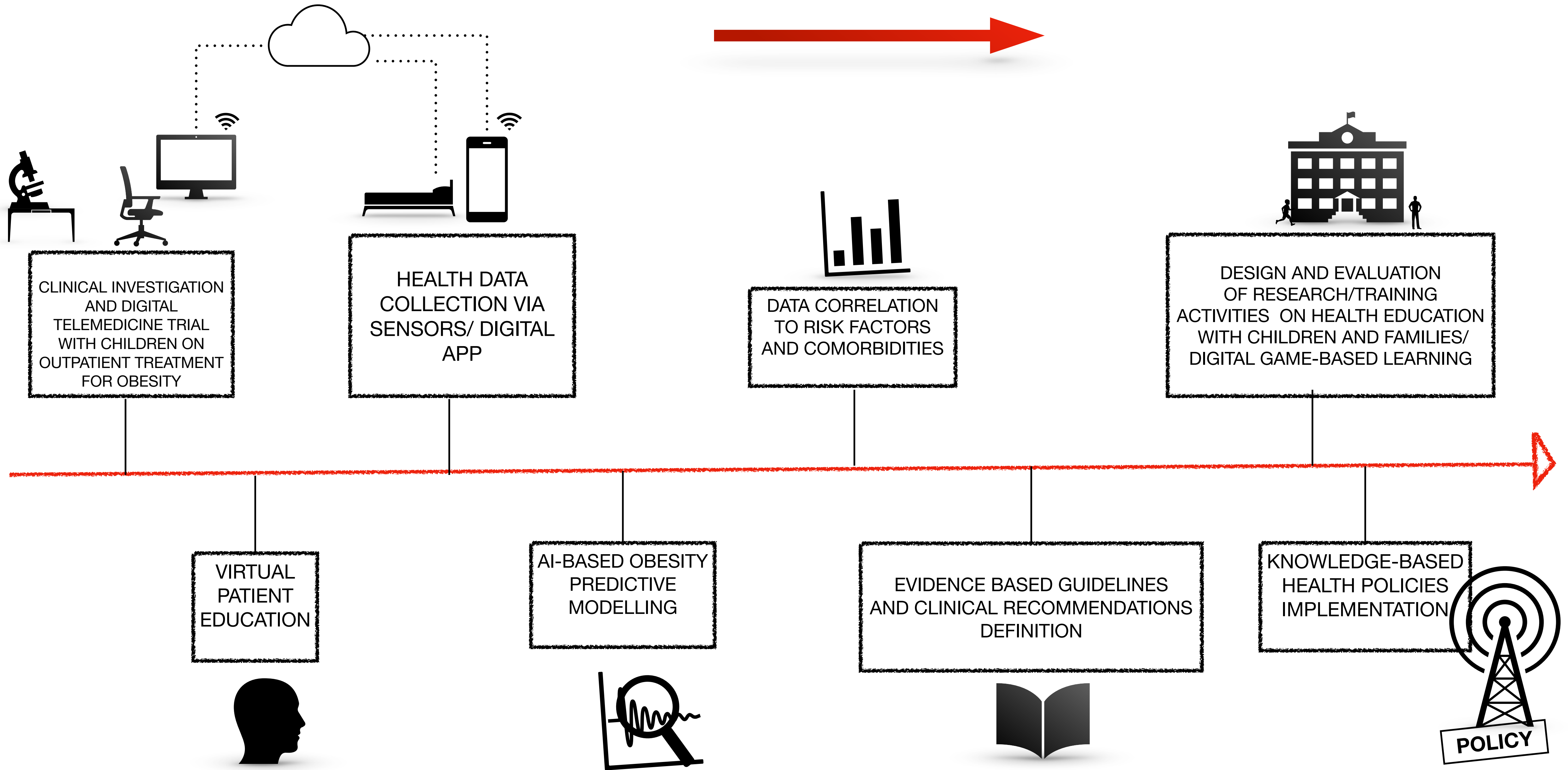


Fig. 1. Salutogenesis umbrella. (Reproduced with permission from Bengt Lindström (Lindström and Eriksson, 2010)).

<u>Pathogenesis</u>	Versus	<u>Salutogenesis</u>
• What causes diseases?		• What causes Health?
• About Avoiding Problems		• About reaching Potential
• Disease/Illness an anomaly		• Inherently flawed,
• Reactive - Absence Disease		• Proactive - Presence Health
• Against pain or Loss		• For Gain or Growth
• Prepares one to live		• Discover how to live fully



AN EXPLORATORY RESEARCH

RESEARCH METHODOLOGY AND QUESTIONS

The survey presented aimed to explore perceptions, experiences and beliefs of 357 students attending degree courses in Education and Training Sciences and Primary Education Sciences of the University of Bari and of the Mediterranean University of Reggio Calabria on theme of obesity, eating disorders and educational strategies for related prevention and treatment (Massaro, Perla, Vinci, 2021)

The research questions:

- *What kind of representations do students have about obesity and eating disorders?*
- *On what dimensions is based their knowledge concerning nutrition and health?*
- *What are their perceptions regarding the design of an education for healthy lifestyles?*
- *What kind of involvement are they developing with the new digital health technologies? What knowledge derives it from? What is the impact of the new digital apps on their health practices?*

The data were collected through:

- the administration of a questionnaire consisting of 31 questions with both open and closed answers
- the task of writing an episode evoked by the word "obesity" experienced personally or indirectly.

The activities were preceded by viewing a short solicitation video and at the end a debriefing was started with questions having an explanatory, reflective and metacognitive function.

The activated laboratory followed the protocol setting of EduLabo (Perla, 2015, Perla, Agrati, 2020). Indeed narrative writing allows the researcher to explore the meanings conveyed by the biographical reconstruction. In its ability to re-signify and at the same time address juvenile disorder, writing can also integrate clinical protocols as a tool of a 'narrative medicine' capable of bringing together biomedical and biographical dimensions in order to transform the history of the disease into a history of care, with tools such as the digital diary eg. (Charon, 2006; Giarelli et al, 2005). At the end of the workshop a debriefing was conducted with questions having an explanatory, reflective and metacognitive function.

357 students (242 UNIBA; 115 from UNIRC) answered the questionnaire.

The data were analyzed in aggregate form. The analysis was conducted by dividing the analysis of the 11 closed-ended items (using descriptive statistical techniques) and that of the 20 open-ended questions (by means of qualitative data analysis and content exploration criteria through computational analysis according to Queries functions).

THE RESULTS

There emerges almost total involvement of students in relation to the theme and the attribution of the phenomenon to causes of a psychological nature, indicating how the educational intervention opens in this direction to address the mental interiority of the person with obesity in a proactive and empowering direction of the personal identity, in connection with any clinical interventions.

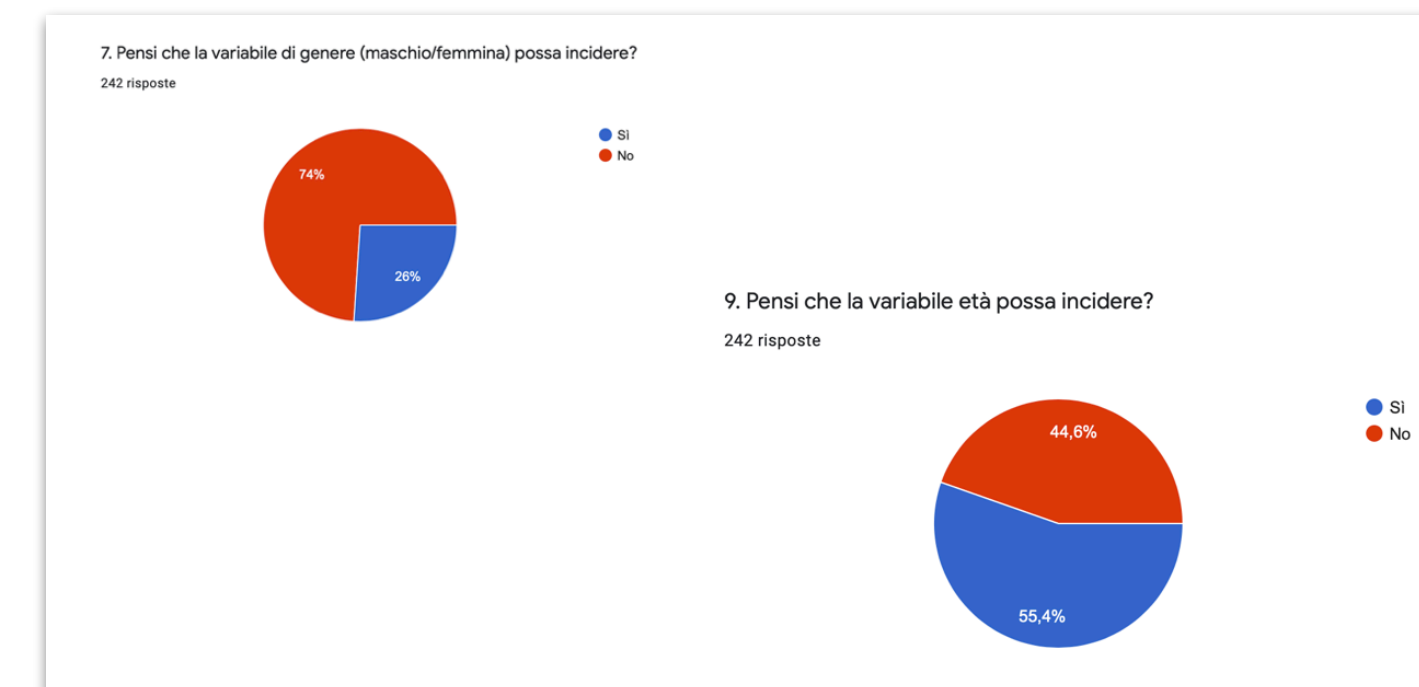
99% of respondents state that they have heard of the problem of obesity or eating disorders and 98% consider obesity a relevant topic. With regard to the channels of access to information relating to the issue of obesity and eating disorders, the analysis shows the prevalence of informal channels compared to formal channels, as shown by the highest co-occurrences:

Table 1. Word Frequency Query with 30 minimum length

Word	Count
Television	128
Social	106
Internet	72
School	63
Media	48
Books	38
Social networks	37
University	31

Among the causes attributed to the condition of overweight or obesity in children, most (N = 203; 57%) consider psychological ones (insecurity, frailty) as priority, followed by sociocultural ones (family income, cultural background; N = 42; 12%).

It is interesting to note the representations on the impact of the variables 'age' and 'gender' on the problem of eating disorders: if there is agreement on considering the gender variable (male / female) to be of little relevance (78% replied negatively), as regards age, the population is divided, as 53% answered affirmatively and 47% negatively.



THE RESULTS

There emerge also:

- Accessibility to healthy food only for 42.6% of students
- Connection between intervention on obesity and environmental sustainability (84.4%)
- Important consequences of childhood obesity of discrimination and prejudice (weight bias at school and at work)
- Students' personal appropriation of nutritional education principles and healthy lifestyles, concerning which they propose immersive play and laboratory activities to be activated for children and families in school settings and on social networks
- Difficulties to activate training proposals for educators and teachers, for which courses, seminars, training, meetings with nutritionists etc. are proposed by students.

THE RESULTS

The last section of the questionnaire was built with questions aimed at grasping the involvement and impact of the new digital health applications on the lifestyles of the generation involved in the research, to detect their access and impact in terms of learning and practices about health:

- *Do you use digital devices or apps to stimulate and / or monitor physical activity or food (eg. Wearable devices for controlling or stimulating physical activity or apps to guide food choices)? If so, which ones?*
- *Do you think that these digital technologies (e.g. smartwatches, pedometers, bracelets with sensors, etc.) can generate real forms of knowledge in those who use them about their physical condition?*
- *Do you think that obesity prevention interventions can be implemented through Telemedicine platforms?*
- *How do you think digital can currently contribute to supporting the issue of obesity prevention? (e.g. online counseling, devices such as pedometer or Applewatch, digital apps to guide food consumption, etc.*



About half of the target of respondents (42%) uses digital devices or apps to stimulate and / or monitor physical or food activity, among which are mentioned in particular the Pedometer (N = 45), App to monitor physical activity (N = 17), the Smartwatch (N = 9) and a variety of applications to monitor calories, weight control, training.

As many as 71% believe that digital technologies can generate real forms of knowledge in those who use them about their physical condition: this data suggests the importance of digital technologies - also confirmed by the prevalence of media, social media and informal communication channels as ways of privileged access to information - in the prevention of eating disorders and in the promotion of healthy behaviors.

In fact, students believe that digital can help support the issue of obesity prevention as digital devices and apps' can help regulate and monitor a certain lifestyle(only some fragments of the textual corpus are reported, postponing the detailed categorical analysis of the open answers in the extended descriptive contribution of the research).



CONCLUSIONS

The data analysis is currently in progress and further development of the study is expected also in other Education degree courses.

The intent is to obtain a database that can offer us useful interpretative support in the interdisciplinary work initiated within the Citel or infer some central topics in the project design aimed at health education in the field of higher education.

The hope is also to demonstrate, in fields with a strong bio-medical-informatics connotation, the relevant role that knowledge and educational practices can play within a scenario that will revolutionize the approach to care and will increasingly promote participation and self-regulation of patients.

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