PhD DISSERTATION PROJECTS

Methodologies to guide consumers towards a healthy and sustainable Mediterranean Diet

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This PhD thesis research project aims to identify innovative strategies to increase awareness regarding the health and environmental benefits of a high adherence to the Mediterranean Diet (MD) and improve healthy food choices in the daily lives of young people and their families.

Metodologie per accompagnare i consumatori verso una Dieta Mediterranea sana e sostenibile

Il presente progetto di tesi di dottorato si propone di identificare e sviluppare strategie innovative per incrementare la consapevolezza in merito ai benefici per la salute e per l'ambiente che possono derivare da un'elevata aderenza alla Dieta Mediterranea (DM) e da scelte alimentari sane nella vita quotidiana dei giovani e delle loro famiglie.

# **1. State-of-the-Art**

Over the past 50 years, improved food systems have led to an increase in life expectancy and reductions in infant mortality, hunger, and global poverty. However, nowadays a global shift towards unhealthy diets is contributing to an increase in obesity and non-communicable diseases (NCDs), as well as environmental degradation and depletion of natural resources (Willett *et al*., 2019). Focusing on the Mediterranean region, this problem concerns the adherence to the Mediterranean Diet (MD), which is moderate to low (Obeid *et al*., 2022). This may be attributed to the increasing process of globalisation and urbanisation, the increase in incomes, the diffusion of supermarkets, the change in family structures, and the development of mass food culture (FAO and WHO, 2019). Fortunately, the scientific evidence on the benefits of the MD is well known and the urgent need to reverse current trends is increasingly stressed. Indeed, it has been evidenced that a high adherence to MD prevents cardiovascular events, improves lipid profile and adiposity levels, and reduces the risk of overweight and obesity, metabolic syndrome (MetS), and type 2 diabetes mellitus (DMT2) in adults (Seral-Cortes *et al*., 2022). Moreover, according to FAO, following this diet can reduce environmental impacts (FAO and WHO, 2019). In fact, as shown in the “Double Food and Environmental Pyramid” developed by the Barilla Center for Food and Nutrition, the MD (based on a high consumption of vegetables, fruits, nuts, unrefined grain cereals, with some fish and limited amounts of red meat and saturated fats) matches with the environmental pyramid thanks to an inverse relationship between nutritionally recommended foods and their environmental impact (Ruini *et al*., 2015). People, particularly the young generation, seem to show a growing interest in a healthy and sustainable lifestyle, albeit knowledge about nutrition and the meaning of sustainability are still poorly understood. In addition, the increasing use of different information channels and social networks complicates the context since the information conveyed is not always reliable.

Therefore, tackling the rapid evolution of this declining adherence to high-quality diets requires timely action at multiple levels of intervention targeting both food production and final consumption. Concerning consumers, nutritional interventions based on nutrition education could be a winning strategy, especially in the young population. Nutrition education should be provided at an early stage, to establish correct and sustainable eating habits in children that can persist over time, to achieve benefits not only in the present but also in the long term. Thus, educational interventions for the whole family would be more effective than communication with adults alone. Based on these considerations, addressing different age groups implies different educational efforts involving schools, national programmes, and the media (Willett *et al*., 2019). In addition, among the traditional tools, dietary guidelines, labels, and infographics are the most used. More innovative methods are also becoming more widespread, such as the use of web applications to improve diet and monitor nutrition (Schoeppe *et al*., 2016). A learning-through-playing approach has been also gaining attention over the last few years as an efficient strategy (Rosi *et al*., 2016). Also worth mentioning is the possibility of promoting healthy snacks to switch on the interest about healthy choices that are often consider more boring and not tasty. Thus, this last strategy involves a close cooperation with food production, which should develop and promote new healthier products more appealing for consumers. Consequently, so far, the opportunities to convey nutrition education are numerous, but it is necessary to further explore this area to implement and combine existing methodologies to develop new ones, more efficient and successful.

Based on these considerations, the aim of this PhD thesis research project is to investigate new methodologies to foster nutrition education, with a particular focus on families.

**2. PhD Thesis Objectives and Milestones**

The following steps can be considered for this PhD thesis project according to the Gantt diagram in Table 1:

1. **Consumer science and co-creation**: sample populations (children, adolescents, adults) from different Mediterranean region are selected and surveyed on several areas: adherence to the Mediterranean Diet (barriers and drivers), food preferences and habits, nutritional knowledge, and general lifestyle. The information tools and channels through which the subjects learn about nutrition are also investigated to understand what strategies are currently applied, their potential and their limitations. The investigation is also implemented by conducting different focus groups.
2. **Development of innovative educational strategies and other tools**: from the collected data, new intervention strategies such as interactive digital channels (apps, social networks) and more practical approaches are developed. This also includes the selection of healthy and sustainable Mediterranean products, through collaboration with food companies, to be offered to families according to their tastes and preferences. These tools could be applied in different contexts (e.g., school and family).
3. **Deployment and assessment**: sample populations under investigation are randomized into different groups to test the newly developed strategies during a selected period: an analysis of the usefulness of the tools used individually and their combination is planned. During this phase, various endpoints will be analysed, such as changes in eating habits, socio-economic background, and anthropometric measures.
4. **Consolidation and dissemination**: the most effective strategies are consolidated to be applied on a large scale in support of national and international public health policies both for the prevention and reduction of obesity and chronic non-communicable diseases in young people and their families and for environmental preservation. This activity also includes sharing the results of the project, through social media, scientific publications, and poster communications, with the aim of raising awareness on the usefulness of a multidisciplinary approach to promote adherence to a healthy and sustainable diet.
5. **Writing and Editing** of the PhD thesis.

***Table 1***Gantt diagram for this PhD thesis project.

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| Activity Months | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **33** | **34** | **35** | **36** |
| A1) | ***Consumer science and co-creation*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| A2) | ***Development of innovative educational strategies and other tools*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| A3) | ***Deployment and assessment*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| A4) | ***Consolidation and dissemination*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| A5) | ***Writing and Editing of the PhD thesis*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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