

Development of a tool to assess the compliance of canteen menus with the Mediterranean Diet

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ERT LOCAL
ERT SEASONAL
ERT REAL

MEDDIET
- MENUS 4 CAMPUS -

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Nutritionist

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The Mediterranean Diet

A sustainable and healthy food pattern

- ✓ One of the healthiest and most sustainable food patterns
- ✓ Alignment of dietary patterns with the MD with the development of compliance indexes
- ✓ Few menu assessment and individual adherence - criteria included lacking uniformity

Grosso G et al. 2017; Nissensohn M et al 2016; Petersson SD et al 2016; Trichopolou A. Et al 2004; Serra-Majem L et al 2020



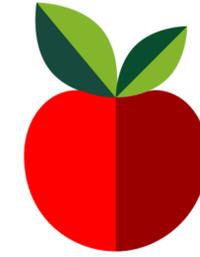
Development of the Index

Literature review



-  MD key principles
-  Existing indexes on individual adherence to the MD
-  Existing indexes of menu assessment

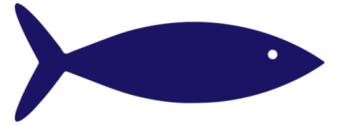




1. Mediterranean Key points

- **Local and seasonal foods, vegetables, whole grains, pulses, fruit, nuts, seeds, herbs and spices, fish over meat, lean meat over red and processed meats, eggs** as a good source of protein, olive oil as the preferred fat, monounsaturated fats over saturated fats, cholesterol and free sugars, fiber
- Typical Mediterranean dishes
- Sweet desserts and beverages
- Wine and dairy not included

2. Indexes of individual adherence to the MD



- Authors considered different parts to create our index
 - PREDIMED, MDS, MEDAS, Med-DQI, MedDiet Score, SMDQ
- Indexes to evaluate specific eating habits or to assess health risk associated with food intake
- Based on the recommendations of the MD Pyramid

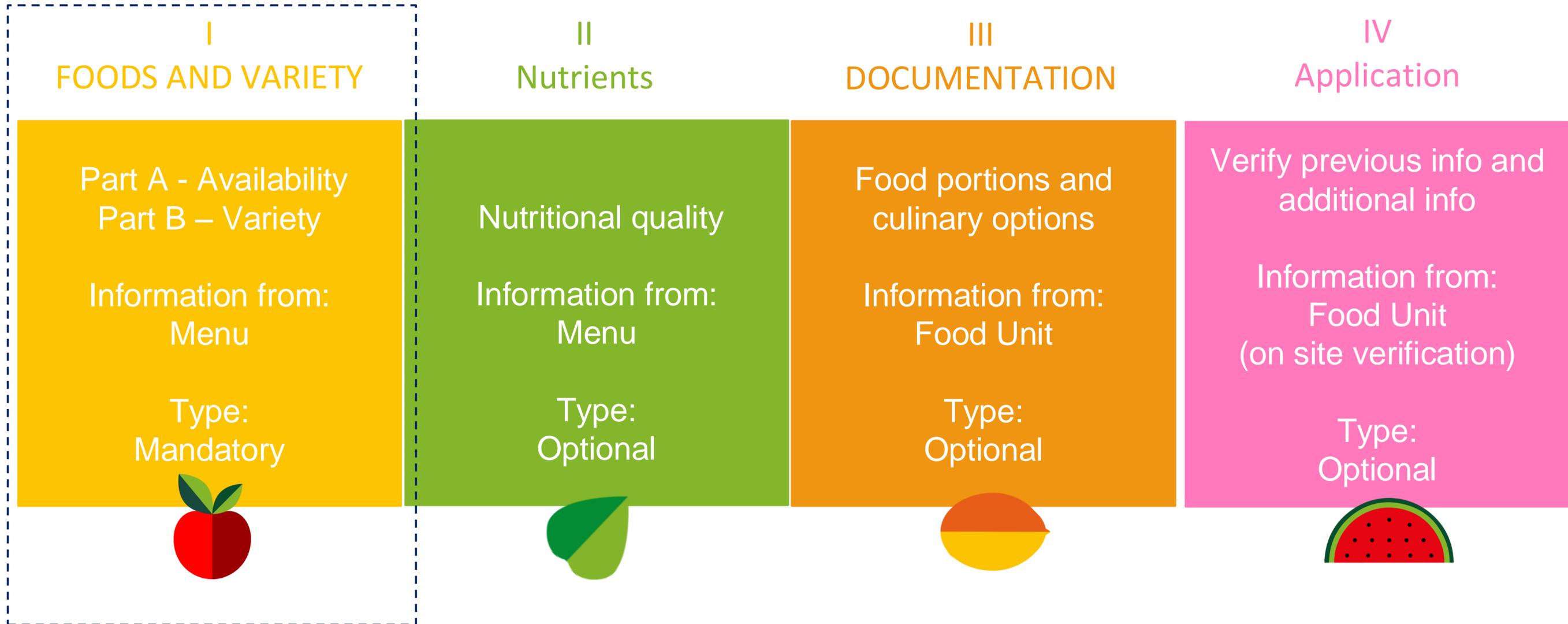
3. Indexes of menu Assessment



- Not related directly to the MD but the components were considered to create our index
- Such as MAST, FRESH, KIMEHS, AVACARD, NEMS-R → KIMEHS – for **children** only
- **Relevant** tool that **fills a gap** in menus assessment specific for MD – broader for all type of menus
or age groups



Nutritionists and food service technicians



DIMENSION I FOODS AND VARIETY

IA – FOODS

IB – VARIETY

QA1	Availability of traditional Mediterranean dishes	QB1	Stewed dishes with tomato and/or onion and/or garlic and/or leek at least 3 times a week
QA2	Availability of vegetables soup	QB2	Traditional soups of the MD (vegetables soup, use of pulses in some soups) at least 3 or 4 times a week
QA3	Availability of non-starchy vegetables (side dish or on dish)	QB31	More than 1 variety daily and not repeated in consecutive days
		QB32	More than 1 variety daily and not repeated in three consecutive days different in at least 3 week days
QA4	Availability of seafood dishes	QB4	Higher number of fish than meat dishes
QA5	Availability of dishes with eggs as the main protein source	QB5	Dishes with eggs as the main protein source at least once a week
		QB61	Lean meat dishes in a higher number than red meat dishes



12 items
Focus on
foods
available



10 items
Focus on
the variety
of foods
available

Frequency

Points range between -2 and 3 (according to importance in the MD)

- Positive points to MD compliance
- Negative points to non-compliance

QA6 Availability of meat dishes

QB62 **No use** of processed meat

QB63 Use of processed meat dishes **no more than once a week**

QA7 Availability of dishes containing pulses

QB71 Pulses - 1 to 2 times a week

QB72 Pulses - 3 or more times a week

QA8 Availability of fresh fruit as dessert

QB81 Fresh Fruit - **Daily**

QB82 Fresh Fruit - **3 to 4 times a week**

QB83 Fresh Fruit - **1 to 2 times a week**

QB84 Sweet desserts **no more than 3 times per month**

QB85 Sweet desserts **no more than once a week**

QB86 Sweet desserts **2 to 3 times / week**

QB87 Sweet desserts **more than 3 times / week**

QA9 Availability of whole grains

QB9 Whole grains - **2 or more times a week**

QA10 Availability of nuts and seeds (in dishes or salads)

QB10 Nuts and seeds (in dishes or salads) - **once or more a week**

QA11 Availability of olive oil (cooking and seasoning)

- -

QA12 Use of seasonal products

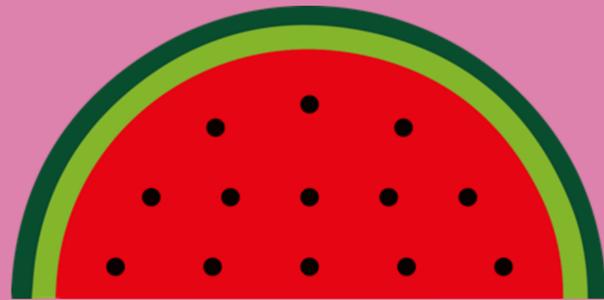
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Difficult to assess

How to apply MeDCIn

1. **4-week** period – 5 days a week with 1 meal per day (lunch or dinner)
2. Answers: **YES (1)** or **NO (0)**
3. Questions 9, 11 and 12 allow for **Not Applicable (NA) = 99**
4. Questions should **not be left unanswered** (if so, score will not be calculated)



Evaluate all options
except for **vegetarian**
or other that restrict the
offer (diet)



Weekly criteria → **1 week
of noncompliance**
enough not to score

Applicability of MeDCIn

60 menus

n = 14 Higher education cafeterias + 25 undergraduate schools +
18 nursing homes + 3 private sector

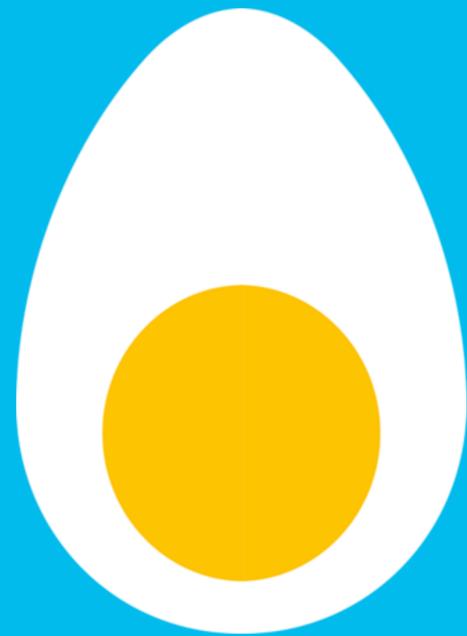


Pilot assessment: 2 researchers
applied the index



High internal consistency (alpha-Cronbach coefficient = 0.88)

High inter-rater reliability (Cohen's Kappa agreement = 0.92)



Results

Menus showed **low agreement** with the MD (ranging from -7 to 13.5 with an average of 4.65 ± 4.2)

IA Availability

Showed a moderate availability
of MD foods
(scores [1.0 and 7.0] Mean 4.87 ± 1.2)

IB Variety

Showed a low variety with:
↑ frequency limited foods
↓ frequency of key foods
(scores [-8.0 and 6.5] Mean 0.22 ± 3.4)



Results

Dimension I is **more influenced** by subdimension IB ($r=0,97$)

IA Availability

Items with **strongest** correlation:

Availability of

- fresh fruit ($r=0,73$) ←
- non-starchy vegetables ($r=0,59$)
- dishes with egg ($r=0,5$)

IB Variety

Item with **strongest** correlation:

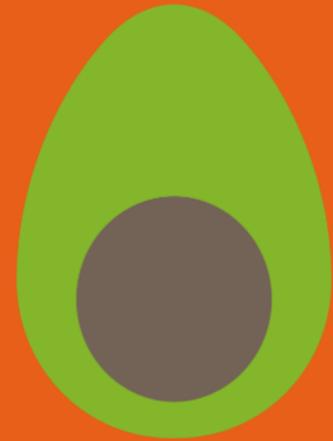
Offer of

- fresh fruit ($r=0,72$) ←
- use of processed meats ($r=0,52$)
- sweet deserts ($r=0,51$)
- seafood dishes higher number than meat dishes ($r=0,48$)

Discussion

Subdimension IA

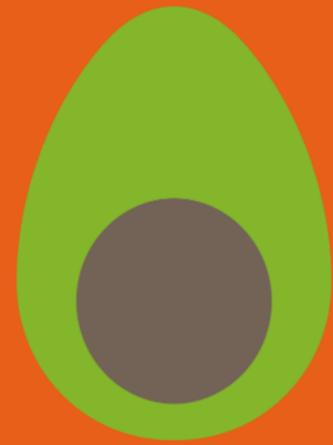
- **Fresh fruit** → Strongest positive correlation reflects the importance on a healthy diet but also seasonality and variety (future improvement)
- **Non-starchy vegetables** → Positive impact – higher points to higher frequency emphasize their importance and variety in the menus
- **Dishes with eggs** → Positive influence – often underrepresented on menus and should be promoted as a rich protein source



Discussion

Subdimension IB

- Apart from Fruit again as the strongest correlation
- **Processed meats** → impact on the score - less frequency higher points - raise awareness to the importance of reduce the consumption
- **Sweet desserts** → moderate correlation – less frequency higher points – promote moderate consumption
- **Seafood availability** → relevant correlation - was limited (higher number of meat dishes) reflecting the food patterns





**Thank you for your
attention**

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SCAN ME

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