EDUCATORS AND FOOD LITERACY MEDIATORS: MEDITERRANEAN DIET ADHERENCE AS EXPERIENTIAL CAPITAL IN PRE-SERVICE INCLUSIVE TEACHERS

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ABSTRACT

Promoting Food Literacy (FL) in adolescence demands educators who themselves embody the cultural and experiential resources needed to translate nutritional knowledge into authentic, multisensory learning experiences. Within Italian inclusive teacher training, however, the food culture of future educators remains a structural blind spot: programmes assume the technical preparation of pre-service teachers while overlooking the corporeal and biographical foundations through which food acquires educational meaning. The present baseline study explores this gap by examining Mediterranean diet adherence in pre-service inclusive teachers enrolled in a southern-Italian specialisation programme, using the validated Italian version of the Mediterranean Diet Adherence Screener (MEDAS) as a proxy of their experiential FL capital. The Mediterranean diet is read here not as a clinical-nutritional reference but as a cultural grammar of seasonality, biodiversity and conviviality through which educators can build the embodied authority needed to accompany adolescents' food learning. Findings outline a profile broadly consistent with the Mediterranean tradition yet uneven on those very foods richest in multisensory pedagogical potential, fish, legumes and fresh fruit whose limited presence in educators' daily practice may translate into a thinner repertoire of didactic mediators for inclusive food experiences. Results are interpreted within a Critical Food Systems Pedagogy framework, arguing that the FL capital teachers bring into training is a precondition for designing inclusive, experiential FL curricula for adolescents. Implications are discussed for teacher-education policy and for the integration of food pedagogy modules, informed by the TASTE-MED multisensory approach, into inclusive-teacher training pathways.

KEYWORDS

Food Literacy; food pedagogy; Mediterranean diet; pre-service teacher education; adolescent food education; MEDAS.

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1. Introduction

Adolescence is a developmental window in which food behaviours, identities and critical orientations toward the food system are decisively shaped.

In a context dominated by ultra-processed products, aggressive food marketing and obesogenic digital environments, Food Literacy (FL) has emerged as one of the most promising educational levers to support adolescents in making informed, sustainable and culturally meaningful food choices (Vidgen & Gallegos, 2014).

Far from a narrow nutrition curriculum, FL encompasses the knowledge, skills and dispositions that enable young people to plan, select, prepare and critically evaluate food in everyday life and, crucially, it emerges from situated, multisensory experience rather than from declarative transmission alone.

The pedagogical effectiveness of FL programmes addressed to adolescents, however, depends on a frequently overlooked precondition: the FL capital of the educators who design and deliver them.

A systematic review of school-based food-literacy programmes has shown that interventions integrating practical, experiential and multisensory components consistently outperform information-transmission models (Bailey, Drummond & Ward, 2019); yet remarkably little attention has been paid to the food culture of the teachers who implement those programmes.

A similar gap is visible in Italian inclusive-teacher training pathways (TFA Sostegno), where the curriculum dedicates no explicit space to food education or to the experiential familiarity of pre-service teachers with the foods they will be expected to use as didactic mediators (MIUR, 2015).

This omission is consequential. Teachers learn the language and concepts of inclusive food education without these necessarily penetrating the deeper layers through which they read and act on educational reality, generating a dissonance between declared and embodied knowledge (Florian & Spratt, 2013; Waitoller & Artiles, 2013). Personal food practices offer privileged access to that deeper level:

they reveal implicit beliefs, bodily dispositions and tacit interpretive schemas that structure the teacher's relation to food long before any reflective act takes place.

This contradiction has recently been documented across higher education more broadly: pedagogical transformation toward embodied models calls for a structural rethinking of training, not the additive inclusion of new content (Bailey et al., 2026).

For pre-service inclusive teachers, the issue takes on particular pedagogical relevance. Sensory familiarity with a wide range of legumes, fish, aromatic herbs and oils constitutes a form of cultural capital that can be redeployed in authentic educational experiences (Isidori, 2015).

Research on multisensory learning indicates that the simultaneous stimulation of multiple perceptual channels (Spence, 2015, 2017) enhances encoding and consolidation of information, with particularly pronounced advantages for learners with atypical sensory profiles (Shams & Seitz, 2022).

The recently elaborated TASTE-MED framework integrates the multisensory approach to FL with the foods of the Mediterranean tradition, demonstrating that structured sensory experience with such foods facilitates FL acquisition in adolescents (Silva, 2026).

Food spontaneously activates sight, smell, taste, touch and hearing (Spence, 2015), while seemingly secondary environmental variables, the colour of tableware, lighting, soundscape, measurably modulate perceptual experience (Vilgis, 2013), turning the design of the convivial space into a relevant educational tool for students with atypical sensory sensitivities, autism-spectrum disorders or marked food selectivity (Raheem et al., 2021).

Systematic reviews on cooking-classes and sensory-play interventions (Coulthard & Sealy, 2017; Hersch et al., 2014) have documented positive effects on food preferences, attitudes and behaviours in school-aged children, supporting the view that direct experience with food is the most effective educational mediator for the cognitive transmission of nutritional information.

Recent pedagogical proposals have moved further still, framing the school meal itself as an experiential planetary-health practice that integrates eating and learning (Sabet & Böhm, 2025); yet every such model presupposes that educators possess the competence necessary to facilitate authentic experiences, an assumption not guaranteed by current training pathways.

Within this scenario, the Mediterranean diet offers a privileged reference. Beyond robust evidence of cardiovascular, metabolic and cognitive protective effects (Estruch et al., 2018; Martínez-González et al., 2015), of reduced oncological risk (Capodici et al., 2024) and of benefits for healthy aging (Andreo-López et al., 2023), it stands as a structurally cultural model, a grammar through which communities build identity and memory around seasonality, biodiversity, conviviality and artisanal knowledge (Montanari, 2018). It thus condenses, in a culturally recognisable form, the pedagogical attributes that FL programmes for adolescents seek to develop.

The present study offers a first baseline contribution documenting the FL capital, operationalised through Mediterranean diet adherence of pre-service inclusive teachers in Italy. The aim is not to evaluate the clinical quality of educators' diets but to obtain a measurable indicator of the experiential foundation they bring into training. By identifying both areas of strength and critical gaps, the study supplies the empirical groundwork on which inclusive food-pedagogy modules and adolescent FL curricula can be designed.

2. Theoretical framework

FL has been defined as a relational construct linking planning, selection, preparation and consumption of food in ways that meet nutritional needs (Vidgen & Gallegos, 2014). Subsequent work has expanded the construct beyond individual competence, situating it within socio-ecological dynamics that recognise structural barriers (Truman & Elliott, 2019) and within Critical Food Systems Pedagogy frameworks that read food as a lens onto social, environmental and cultural relations rather than as a purely nutritional object.

This expanded conception aligns with the embodied turn in cognitive science. A systematisation of six perspectives through which embodied cognition redefines the mind–body relationship has shown that cognition is situated, time-pressured, action-oriented and reliant on the environment for off-loading cognitive work (Wilson, 2002).

An earlier line of work had framed cognition as a process emerging from the continuous interaction between organism and environment (Varela, Thompson & Rosch, 1991), while embodiment was later proposed as a unifying perspective for psychology, integrating perceptual, motor and cognitive processes within a single

coherent framework (Glenberg, 2010). The neuroscientific substrate emerged with evidence that the sensorimotor system is constitutive of conceptual formation, including for abstract concepts (Gallese & Lakoff, 2005).

The pedagogical translation of these insights is direct: classroom embodied learning produces measurable gains in retention and transfer compared with transmissive approaches (Macedonia, 2019), and embodied education has been theorised as a pathway toward more integrated learning capable of overcoming the disciplinary fragmentation typical of contemporary schooling (Singh, 2021). For inclusive teacher education, this implies that professional competence cannot be conceived as a body of declarative knowledge separable from the body that acts; rather, it manifests in the quality of presence in the classroom, in the capacity to read relational climates and to adapt proposals in real time (Pellerey, 2021).

Food, in this perspective, occupies a unique position. In education it operates between corporeality and emotion in a way irreducible to either biology or pure cognition (Moscato, 2015); the educator's sensory biography, built through tasting memories, olfactory traces and convivial rituals has accordingly been framed as a sedimented professional resource (Birbes, 2018). The pedagogy of food has been defined as a theory and practice epistemologically distinct from the bio-medical knowledge of dietetics, since the term 'nutritional education' is reductive in foregrounding only the sanitary dimension (Isidori, 2015).

The teacher who has lived authentic sensory experience with food brings to the classroom the credibility of one who inhabits the territory of food, not of one who describes it from outside; this is what allows the educator to support adolescents' curiosity toward unfamiliar foods, to face neophobic resistances without projecting personal anxieties, and to design FL experiences that genuinely engage all sensory channels.

The inverse situation, educators whose relation with food has been shaped exclusively by the logics of nutritionism (Foucault, 2008) produces a tension with the inclusive paradigm. Nutritionism conceptualises the body through a mechanistic logic that reduces eating to nutrient input, promoting an ethics of individual responsibility incompatible with a phenomenological understanding of the lived body. Educators socialised into these logics are likely to find it harder to design inclusive FL experiences that welcome difference without normalising it, that value embodied biodiversity rather than ranking it through sanitary metrics,

and that recognise food as an existential dimension irreducible to caloric calculation.

Within this theoretical horizon, mapping the experiential food capital of pre-service inclusive teachers is more than a descriptive exercise. It is a precondition for any serious attempt to integrate FL into both teacher training and adolescent curricula along the lines proposed by Critical Food Systems Pedagogy.

3. Method

The study provides a first empirical contribution to understanding the food habits of pre-service inclusive teachers, with specific reference to Mediterranean diet adherence taken as a proxy of FL capital.

The specific aims are:

- to estimate the level of Mediterranean diet adherence in a sample of pre-service inclusive teachers using the validated Italian version of the Mediterranean Diet Adherence Screener (MEDAS; Agnoli et al., 2018; Schröder et al., 2011);
- to analyse item-level adherence in order to identify strengths and gaps in the components of the model;
- to explore differences in adherence by gender and age.

Three research questions are addressed:

- RQ1: What is the baseline profile of Mediterranean diet adherence in Italian pre-service inclusive teachers, in terms of total MEDAS score and category distribution (low, moderate, high)?
- RQ2: Are there statistically significant differences in adherence as a function of gender or age?
- RQ3: Which MEDAS items show the highest and lowest endorsement, identifying patterns of strength and criticality in the experiential FL capital of the sample?

No causal hypotheses are formulated linking adherence to inclusive pedagogical competence; such relations would require experimental or quasi-experimental designs and dedicated instruments not available in this baseline study.

3.1 Research design

The study adopted a descriptive-correlational design intended to document the baseline profile of Mediterranean diet adherence in pre-service inclusive teachers and to explore associations with demographic variables. It is a preliminary exploratory study oriented toward mapping the experiential food capital these professionals bring into training, without claiming to document causal relations between food practices and pedagogical competences. The approach sits within a post-positivist paradigm that recognises the complexity of educational phenomena while maintaining a commitment to methodological rigour and empirical verifiability (Creswell & Creswell, 2023).

3.2 Participants

The sample comprised 569 pre-service inclusive teachers enrolled in specialisation pathways at a southern-Italian university during the 2024–2025 academic year. The cohort spanned from the early twenties to the late sixties, reflecting the heterogeneity typical of teacher-specialisation programmes, which bring together recent graduates and professionals returning to formal training after years in the classroom. Gender distribution mirrored the marked feminisation of the teaching profession in Italy, with women accounting for roughly seven respondents out of ten. Recruitment followed a purposive non-probabilistic logic; the resulting constraints on generalisability are openly addressed in the limitations section.

3.3 Instrument

Mediterranean diet adherence was assessed through the Italian version of the Mediterranean Diet Adherence Screener (MEDAS), a brief screening tool developed within the PREDIMED study (Schröder et al., 2011) and subsequently validated for the Italian population (Agnoli et al., 2018). The instrument comprises fourteen dichotomous items probing the cardinal food behaviours of the Mediterranean model, with psychometric properties confirmed in the Italian context (Bonaccio et al., 2021).

The items cover the constitutive axes of the Mediterranean tradition: the use of extra-virgin olive oil as the main cooking fat and the adequacy of its daily quantity; sufficient daily intake of vegetables and fruit and weekly intake of legumes, fish and nuts; moderation in red meat, butter, commercial sweets and sugary drinks; the preference for white over red meat; the habitual practice of sofrito as a culinary base; and the weekly consumption of wine. Adherence is condensed into a single

score, with a conventional threshold separating insufficient from satisfactory adherence.

It is essential to underline that MEDAS measures the frequency of food consumption, not pedagogical competence, sensory familiarity or design capacity in the territory of food. The instrument provides a proxy of educators' experiential food capital but does not capture the more complex dimensions of professional FL, multisensory competence, pedagogical authority, curricular design ability which would require qualitative and observational instruments not available within this preliminary study.

3.4 Procedure and analysis

Data collection took place between February and March 2026 through an online platform, ensuring participant anonymity and full compliance with European data-protection requirements (Regulation EU 2016/679). Participation was voluntary and preceded by informed consent; completion of the self-report questionnaire required approximately ten to fifteen minutes. All analyses were performed in SPSS, with standard inferential thresholds applied across the study.

Preliminary analyses combined descriptive statistics, normality tests to verify parametric assumptions and a check of internal reliability through Cronbach's α. The reliability value was acceptable for an instrument composed of dichotomous items and consistent with the Italian validation of the tool (Bonaccio et al., 2021). Correlational analyses relied on Pearson's coefficient for continuous variables with approximately normal distribution, with the age–adherence relation further visualised through a scatterplot fitted with a linear regression line.

Group comparisons were conducted by means of an independent-samples t-test for gender and a one-way ANOVA for age band, each accompanied by the corresponding effect-size estimate.

4. Results

4.1 Mediterranean diet adherence

MEDAS scores showed a near-normal distribution with slight negative skewness (M = 8.61, SD = 2.50, median = 8.0, observed range = 2–14, skewness = −0.18, kurtosis = −0.42). The Shapiro–Wilk test was statistically significant (W = 0.976, p = .008), an expected outcome with n = 569 even in the presence of minimal deviations from

normality, as confirmed by skewness and kurtosis values close to zero. Parametric statistics are therefore justified.

Notably, no participant scored below 2, indicating that even respondents with the lowest adherence retained minimal behaviours consistent with the Mediterranean model, most likely the use of EVOO as the main cooking fat (Table 1).

Adherence category	n	%	M MEDAS	SD	Range
Low (≤6)	113	19.9	5.1	0.9	2–6
Moderate (7–9)	250	43.9	7.9	0.8	7–9
High (≥10)	206	36.2	11.2	1.1	10–14
Total	**569**	**100.0**	**8.61**	**2.50**	**2–14**

Note. Range refers to observed minimum and maximum; theoretical MEDAS range is 0–14.

Table 1. Sample distribution by Mediterranean diet adherence categories (N = 569)

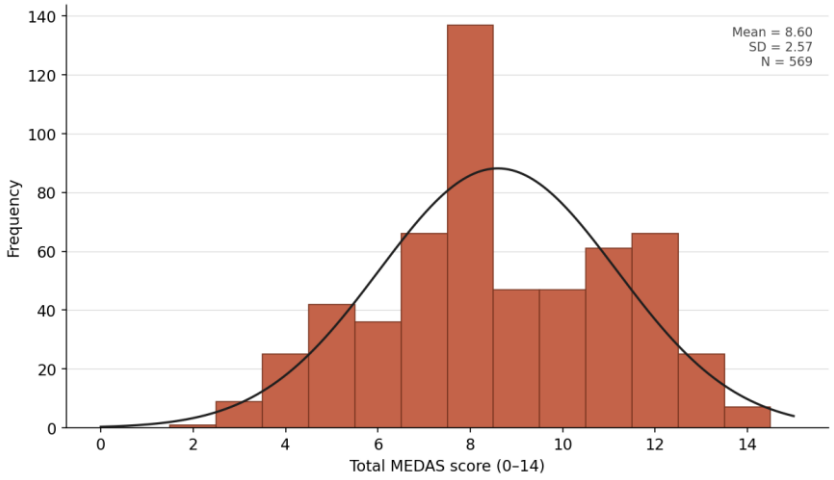


Figure 1. Histogram of MEDAS total scores with normal curve overlay.

Overall, 456 participants (80.1%) sat above the threshold for good adherence (≥7). Figure 1 shows the approximately normal distribution, with concentration in the moderate-to-high band. The figure compares favourably with values reported for the Italian adult population in studies using the same instrument (Agnoli et al., 2018), with appropriate interpretive caution given the potential selection bias of

non-probability sampling and the social-desirability bias typical of self-report food questionnaires.

4.2 Item-level analysis

Item-level analysis revealed an internally differentiated profile. The items with the highest endorsement identify consolidated behaviours: EVOO as main cooking fat (96.0%), preference for white over red meat (79.6%), and sofrito ≥2 times/week (75.7%). Together, these data sketch a solid adherence to the components of the Mediterranean model linked to fat choice and limitation of ultra-processed foods a shared experiential anchorage on which inclusive FL modules can readily build (Table 2).

Item	Description	n (Yes)	% (Yes)
1	EVOO as main cooking fat	546	96.0
13	Preference for white over red meat	453	79.6
14	Sofrito ≥2 times/week	431	75.7
6	Butter/margarine <1 serving/day	389	68.4
7	Sugary drinks <1/day	387	68.0
3	Vegetables ≥2 servings/day	375	65.9
11	Commercial sweets <3/week	350	61.5
12	Nuts ≥3 servings/week	343	60.3
5	Red meat <1 serving/day	340	59.8
9	Legumes ≥3 servings/week	323	56.8
2	EVOO ≥4 tablespoons/day	309	54.3
10	Fish ≥3 servings/week	293	51.5
4	Fruit ≥3 servings/day	262	46.0
8	Wine ≥7 glasses/week	98	17.2

Table 2. Percentage of affirmative responses per MEDAS item, ordered by decreasing % (N = 569)

Critical areas concern adequate intake of fresh fruit (46.0%), fish (51.5%), EVOO quantity (54.3%) and legumes (56.8%), the very foods whose sensory biodiversity makes them the richest didactic mediators for adolescent FL, so that a thinner familiarity on the educator's side may narrow the available pedagogical repertoire. Wine intake recorded the lowest endorsement (17.2%), interpretable as a cultural update consistent with recent evidence on alcohol-related risk even at moderate doses.

4.3 Differences by gender

The analysis revealed no statistically significant gender differences in adherence: women and men recorded essentially overlapping mean scores, with a slight imbalance in variability handled through the Welch correction and a negligible effect size confirming the absence of meaningful differences. Pedagogically, this convergence suggests that the Mediterranean food culture cuts across gender, offering a shared experiential ground on which FL training can be designed for the whole cohort (Table 3).

Gender	n	M	SD	95% CI	Cohen's d
Female	396	8.64	2.39	[8.40, 8.87]	0.04
Male	162	8.53	2.77	[8.10, 8.96]	

Note. t(556) = 0.451, p = .653.

Table 3. Mediterranean diet adherence by gender

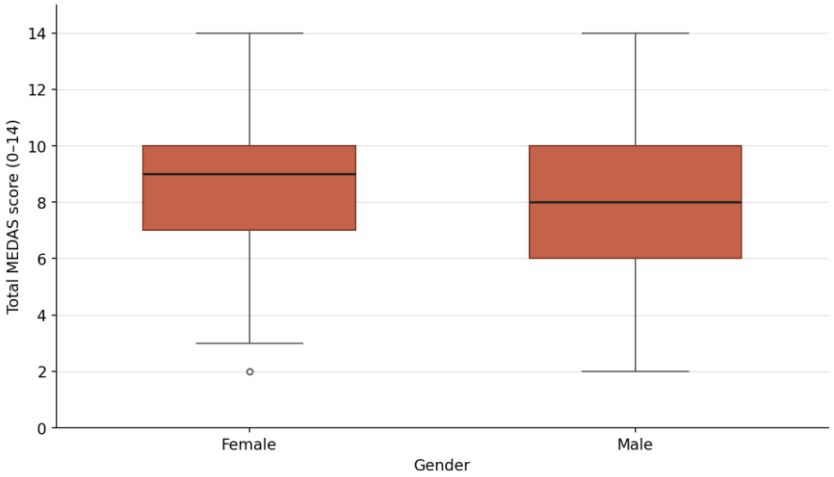


Figure 2. Boxplot of MEDAS scores by gender.

Figure 2 visualises MEDAS scores stratified by gender. Medians and dispersion are essentially overlapping, with only a slightly wider spread in the male group, a visual coherence that reinforces the reading of food culture as a shared cohort resource rather than as a gendered trait.

4.4 Differences by age band

The one-way ANOVA showed no statistically significant differences across age bands, with means essentially homogeneous from the youngest to the oldest cohort and a negligible effect size that locates the influence of age on adherence well below any practically relevant threshold. Levene's test confirmed homogeneity of variances, supporting the comparability of the four subgroups (Table 4).

Age band	n	M	SD	95% CI
18–30 years	151	8.72	2.52	[8.32, 9.13]
31–40 years	210	8.51	2.55	[8.17, 8.86]
41–50 years	145	8.64	2.39	[8.25, 9.03]
51+ years	58	8.66	2.54	[7.99, 9.32]

Note. $F(3, 565) = 0.174$, $p = .914$, $\eta^2 = .001$.

Table 4. Mediterranean diet adherence by age band

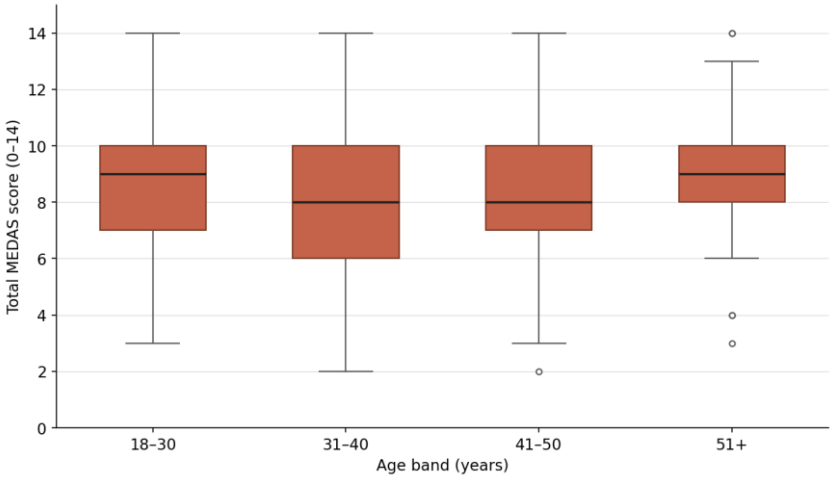


Figure 3. Boxplot of MEDAS scores by age band.

Figure 3 visualises the distributions across the four age bands. Medians overlap and dispersions are comparable, offering a graphic counterpart to the statistical result. The pattern is pedagogically significant: adherence does not behave as a function of generational cohort but as the expression of transversal cultural schemas, suggesting that food culture sediments early and remains stable through professional life. For FL training, this means experiential modules can be planned as cross-cohort encounters around shared sensory references rather than as career-stage differentiated tracks.

4.5 Age–adherence correlation and synthesis of statistical model

The correlational analysis confirmed and refined the picture: no significant linear association emerged between age, treated as a continuous variable, and Mediterranean diet adherence. The convergence between ANOVA and correlational analysis is methodologically reassuring, since two complementary statistical strategies converge on the same reading, and pedagogically meaningful in discouraging the temptation to read the cohort through generational lenses. The scatterplot in Figure 4 displays a random distribution of points around the regression line, with no systematic pattern across the age range; age therefore turns out to be substantially irrelevant for predicting adherence in this cohort, signalling that biographical, territorial and experiential variables are the ones worth pursuing in further studies.

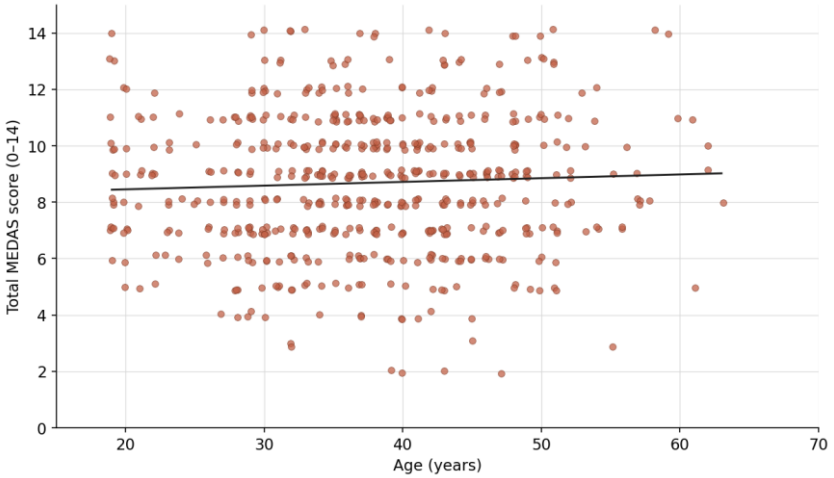


Figure 4. Scatterplot of the relation between age and MEDAS score (N = 569). The linear regression line shows the absence of a systematic relation between the variables (slope = −0.003, $R^2 < .001$).

Pedagogically, the implication is more far-reaching than a null finding may suggest. If food culture among future inclusive teachers does not erode across generations, the cohort can be read as a preserved channel of inter-generational cultural transmission, of particular relevance given the disengagement of adolescents from the Mediterranean tradition documented in the literature. Educators thus emerge as potential cultural mediators able to bridge a transmission gap that schools, on their own, are unlikely to close.

Tables 5 and 6 provide a complete synthesis of correlational and regression analyses and of the statistical tests performed to address the three research questions.

Analysis	Statistic	Value	p
Pearson correlation	r	−0.012	.771
Linear regression	R^2	<.001	—
	Slope	−0.003	—
	Intercept	8.74	—

Note. No correlation reaches statistical significance (α = .05). $R^2 < .001$ indicates that less than 0.02% of MEDAS variance is explained by age.

Table 5. Correlation between age and Mediterranean diet adherence; linear regression statistics (N = 569)

Analysis	Variables	Test	Result	Effect size
Descriptive	Total MEDAS	M, SD, range	M=8.61±2.50	—
Normality	Total MEDAS	Shapiro–Wilk	W=0.976*	—
Gender diff.	Gender → MEDAS	Welch t-test	t(556)=0.451 ns	d=0.04
Age diff.	Age band → MEDAS	One-way ANOVA	F(3,565)=0.174 ns	η^2=.001
Correlation	Age × MEDAS	Pearson r	r=−.012 ns	R^2<.001

Note. ns = not significant at α = .05.

Table 6. Synthesis of statistical analyses (N = 569)

5. Discussion

The study documents moderate-to-high Mediterranean diet adherence among pre-service inclusive teachers, with the large majority of the cohort sitting above the threshold for good adherence. This figure compares favourably with what the general Italian adult population shows in studies using the same instrument (Agnoli et al., 2018). Methodological caution remains essential: non-probabilistic sampling may have introduced selection bias, and self-report invites social desirability, participants may have over-reported foods culturally encoded as healthy (fruit, fish, legumes) and under-reported stigmatised ones (sweets, sugary drinks), with possible inflation of overall adherence. Recall of weekly frequencies is itself error-prone, particularly for irregularly consumed foods, and the elevated profile should accordingly be read as a plausible upper estimate rather than as an exact measure.

Despite these caveats, the homogeneity of the profile across gender and age suggests that adherence in this population is not driven by demographic variables but reflects deeper cultural patterns linked to food socialisation and territorial context. The absence of generational differences partially contradicts the literature documenting progressive disengagement from traditional dietary schemas in younger cohorts (Di Daniele et al., 2023), inviting the reading of the pre-service teaching population as a relatively preserved segment of cultural food

transmission. Attitudes toward food are structured early through parental modelling (Cuzzocrea et al., 2022) and influenced by personality factors that condition nutritional choices (Mercurio et al., 2025); educators who maintain a positive relation with the Mediterranean tradition are therefore well-positioned to act as cultural mediators of FL within school contexts.

This last point reframes the present findings within the call's central concern with adolescent FL. If pre-service teachers preserve a positive relation with the Mediterranean tradition, this constitutes the experiential base on which to build structured FL interventions, both within teacher training and, downstream, within adolescent curricula. The TASTE-MED framework for multisensory food literacy in adolescence supports this trajectory, documenting that a structured approach to the sensory exploration of Mediterranean foods facilitates FL development in adolescents more effectively than interventions centred on the transmission of nutritional information (Silva, 2026).

Item-level analysis, however, reveals criticalities that take on particular relevance when read through an FL lens. Inadequate intake of fresh fruit, fish and legumes is problematic not primarily for nutritional reasons but because these very foods are privileged multisensory mediators for inclusive food-education experiences in virtue of their sensory biodiversity. Fish, with its variety of textures, aromas and flavours across species and preparations, offers multisensory stimulation documented as particularly effective for learners with autism-spectrum disorders and atypical sensory profiles (Raheem et al., 2021). Educators with limited fish consumption are likely to manifest narrow sensory familiarity with the breadth of fish varieties, preparations and culinary transformations, a gap that may translate into difficulty designing educational experiences that exploit the full multisensory potential of these foods.

Legumes present extraordinary biodiversity in colour, shape, pre- and post-cooking texture and aromatic profile, making them ideal didactic materials for graded sensory exploration, perceptual classification and physical-transformation experiments. Limited practical familiarity with legumes may translate into an impoverished repertoire of available didactic mediators. Fresh fruit, with its marked seasonality, chromatic variety and organoleptic diversification, is similarly a key resource for connecting sensory experience to temporal and territorial dimensions

, a connection central to FL programmes that aim to foster ecological and citizenship awareness in adolescents.

It is essential to clarify that these interpretations are theoretical inferences within a Critical Food Systems Pedagogy framework, not empirical results documented by the data collected. MEDAS measures consumption frequency, not sensory familiarity, design competence or pedagogical authority. The associations proposed here between food patterns and inclusive FL competences constitute plausible hypotheses requiring empirical verification through future studies with dedicated instruments, observations of teaching practice, interviews on sensory familiarity, correlations between MEDAS and validated measures of pedagogical competence.

Alongside the criticalities, results highlight pedagogically relevant strengths. The near-universal use of EVOO as main cooking fat indicates familiarity with this cardinal element of the Mediterranean tradition, which offers multisensory educational potential through aromatic varieties, territorial differences and sensory transformations with temperature. The high prevalence of sofrito as a culinary base indicates familiarity with a traditional practice involving complex chemical and sensory transformations, caramelisation, Maillard reactions, aromatic development, that lends itself naturally to embodied FL activities with adolescents. These strengths can serve as anchors for training interventions: educator preparation can begin from existing familiarity and progressively extend toward less familiar foods, building corporeal competence through guided experience rather than cognitive transmission.

A systematic review of secondary-school FL programmes has documented that interventions are most effective when they integrate practical, multisensory experiences rather than confining themselves to nutritional information, confirming that food competence requires experiential learning (Bailey et al., 2019). That review did not, however, systematically examine the preparation of the educators implementing those programmes, signalling a gap in the literature analogous to the one observed in Italian inclusive-teacher training pathways. A subsequent high-school FL curriculum based on practical experiences documented improvements in food competences but again left unaddressed the question of whether intervention quality depends on the experiential food capital of those who deliver it (Ruiz, Radtke & Scherr, 2021). The present study contributes by

documenting a moderate-to-high baseline profile in pre-service educators, with specific criticalities on foods central to multisensoriality.

Embodied education has been framed as a pathway toward more integrated learning that overcomes disciplinary fragmentation and the mind–body separation typical of contemporary schooling (Singh, 2021), offering further support for the integration of structured corporeal-experience modules into inclusive teacher training. The corporeal dimension of learning takes on particular relevance in inclusive teacher preparation, where future professionals are called to design educational interventions valorising multiple sensory channels to support the inclusion of learners with special educational needs, a class of learners for whom multisensory FL approaches are not optional enrichments but central methodological resources.

Findings have direct implications for the redesign of inclusive teacher-training pathways. A clear case emerges for integrating professional FL modules into curricula, conceived as the development of corporeal competence for the use of food as a multisensory didactic mediator. Training should include experiential laboratories where teachers experiment with structured sensory exploration of Mediterranean foods, building practical familiarity with sensory biodiversity; reflective autobiographical pathways enabling future teachers to thematise their own food epistemologies and recognise how these tacitly sediment in classroom practice; and assisted didactic-design activities that translate corporeal competence into concrete educational proposals for learners with special educational needs. The gaps identified on fish, legumes and fresh fruit constitute formative opportunities: these foods could become privileged foci of laboratories connecting personal sensory experience to pedagogical reflection on inclusive FL potential. Recent pedagogical frameworks have proposed experiential approaches integrating the meal and learning (Sabet & Böhm, 2025), but their implementation requires educators to possess corporeal competence not transmissible cognitively.

The study presents methodological, sampling, instrumental and epistemological limitations that constrain generalisability and interpretation. The cross-sectional design precludes causal inference: it is not possible to establish whether Mediterranean diet adherence precedes, accompanies or follows the development of inclusive pedagogical competences. The absence of a control group limits interpretation of the specificity of the profile detected, while the absence of

repeated measures prevents assessment of stability over time. Purposive non-probabilistic sampling limits generalisability to the national population of pre-service inclusive teachers, with possible selection bias as a threat to external validity. The geographic distribution implies that results may reflect territorial specificities not generalisable to the national context.

MEDAS measures consumption frequency but does not capture sensory familiarity, design competence in the territory of food or pedagogical authority in accompanying food experiences. Self-report data collection carries social-desirability and recall biases. The fundamental epistemological limitation concerns the gap between the complexity of the theoretical framework and the specificity of the empirical instrument: the interpretations proposed within the Critical Food Systems Pedagogy framework constitute plausible theoretical inferences anchored to MEDAS-derived data, not verified empirical results.

FL is conditioned by multiple barriers that the instrument does not capture, economic constraints, limited territorial accessibility, gaps in culinary skills, absence of social support, deficits in health literacy (Truman & Elliott, 2019); inadequate consumption results may therefore reflect structural obstacles rather than the simple expression of individual choices.

Future studies should adopt probabilistic stratified sampling to ensure national representativeness; integrate validated questionnaires of professional FL; employ validated scales to measure representations of inclusion; conduct structured observations of teaching practice, documenting the translation of sensory familiarity into educational quality; implement longitudinal designs tracing the evolution of food patterns and pedagogical beliefs from training to professional practice; and test the effectiveness of transformative interventions through randomised controlled trials comparing TASTE-MED multisensory laboratories with conventional nutritional training.

6. Conclusions

The present study has documented the baseline profile of Mediterranean diet adherence in Italian pre-service inclusive teachers. Findings confirm the three research questions: moderate-to-high adherence, with the large majority of the cohort sitting above the threshold for good adherence; homogeneity of the profile

across gender and age; and a differentiated item-level pattern with strengths on EVOO and sofrito but criticalities on fresh fruit, fish and legumes.

The contribution does not document empirical relations between food practices and inclusive pedagogical competences; it provides a baseline food profile interpreted through a Critical Food Systems Pedagogy and FL lens, which proposes, without empirically verifying, associations between experiential food capital and multisensory pedagogical authority. The criticalities identified on fish, legumes and fruit constitute gaps in Mediterranean adherence that we read as potential limits in corporeal competence, while remaining a theoretical hypothesis requiring verification through future studies with dedicated instruments, structured observations of teaching practice, interviews on sensory familiarity, correlations between MEDAS and validated measures of pedagogical competence.

Empirically, the study fills a gap in the Italian literature by providing a preliminary quantitative description of a population not previously studied. Theoretically, it proposes an original frame connecting everyday corporeal practices and inclusive professional competences, extending the debate on FL teacher education to a domain, food, traditionally neglected in inclusive teacher-training research. Methodologically, it operationalises complex constructs through a validated instrument while explicitly recognising its limits. In applied terms, it identifies pedagogically interpretable patterns that can orient the design of structured training interventions.

Implications for teacher education are direct: the structural gap of TFA Sostegno pathways, where attention to the food culture of future educators is absent (MIUR, 2015), can be reframed as an opportunity to rethink professional preparation. The absence of FL modules reflects an intellectualist conception of competence that ignores the corporeal dimensions of pedagogical action (Bailey et al., 2026; Moscato, 2015). The proposal to integrate experiential laboratories based on guided multisensory exploration of Mediterranean foods finds support in the profile detected: pre-service teachers retain a solid Mediterranean cultural base on which to build, while presenting gaps on foods crucial for sensory biodiversity that could become privileged foci of intervention, fish for the inclusion of learners with atypical sensory profiles, legumes for graded perceptual exploration, fresh fruit for the binding of taste, seasonality and territory. The TASTE-MED framework offers an operational model translatable into concrete training practices for inclusive teacher

pathways, suggesting an implementation route grounded in direct experience rather than cognitive transmission (Silva, 2026).

The study advances scientific debate by demonstrating heuristic potential in connecting apparently distant domains, personal food practices and inclusive professional competences, through a unifying interpretive key in Food Literacy. Food emerges as a transversal mediator allowing work on corporeal competence within a culturally accessible, recognisable and pedagogically powerful territory; the profile documented here constitutes the empirical ground on which future studies can verify the theorised associations and on which adolescent FL programmes can build with educators who themselves embody, rather than merely describe, the food cultures they teach.

The challenge consists in translating epistemological awareness about the centrality of the body in learning into concrete training activities that valorise multisensory experience as the foundation of inclusive pedagogical competence. Only through competence understood as the corporeal capacity to accompany lived experiences will teacher education prepare educators capable of designing multisensory inclusive pathways that recognise inclusion as the inalienable ethical horizon of education and that meet adolescents where Food Literacy is most needed.

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