CHOP: CHOking Prevention project

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THE PROBLEM

Despite the fact that choking injuries are predictable and preventable, data from the Susy Safe registry shows that:

- **40%** of food choking injuries occurred **without adult supervison** while the child was eating
- **60%** of food choking injuries occurred **under adult supervision** but with the child served with improper food

PARENTS ARE NOT AWARE OF FOOD CHOKING HAZARD

THE SOLUTION

MANDATORY TRAINING ON PRIMARY AND SECONDARY PREVENTION OF FOOD CHOKING IN CHILDREN AIMED AT FAMILIES AND CHILDREN CAREGIVERS

CHALLENGES TO THE IMPLEMENTATION OF THE SOLUTION: SUSTAINABILITY

OFFERING ONE-TO-ONE TRAINING TO ALL FAMILIES AND CHILDREN CAREGIVERS IS NOT SUSTAINABLE

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SUCH TRAINING IS LEFT TO FAMILIES/CAREGIVERS INITIATIVE AND IT IS NOT FOR FREE

↓

MEAN COST OF A PBLS* COURSE ≃150€ (≃165$), FOR BOTH PARENTS ≃300€ (≃330$)

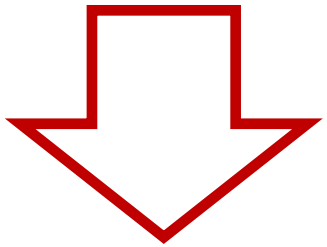
* Pediatric Basic Life Support: the focus is on secondary prevention

WHAT IS THE BURDEN OF TRAINING COSTS?

In 2019, the proportion of Italian families at risk of poverty* was:

- 21.5% families with one child
- 23.5% families with two children
- 34.7% families with three or more children

Training might not be affordable for **20-30% of Italian families with two ore more children**



socio-economic inequalities in the access to the training on food choking prevention

WARNING: family's low socio-economic is known to be a choking predictor in children

Source: Italian National Institute of Statistics

CHOP: CHOking Prevention project

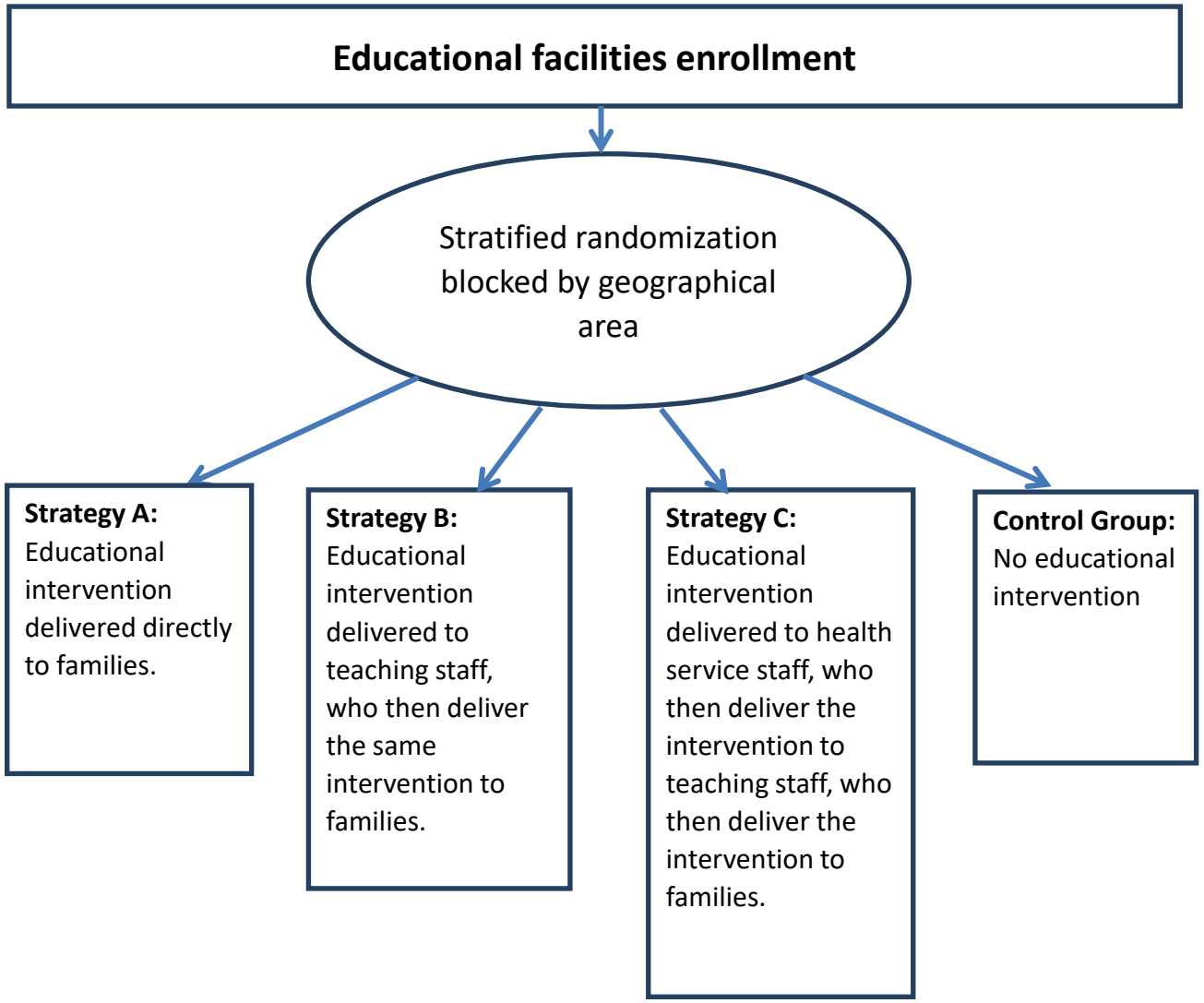
Project developed in collaboration with the Italian Ministry of Health

aimed at evaluating the effectiveness of public health intervention on food choking by comparing three different school-based intervention strategies

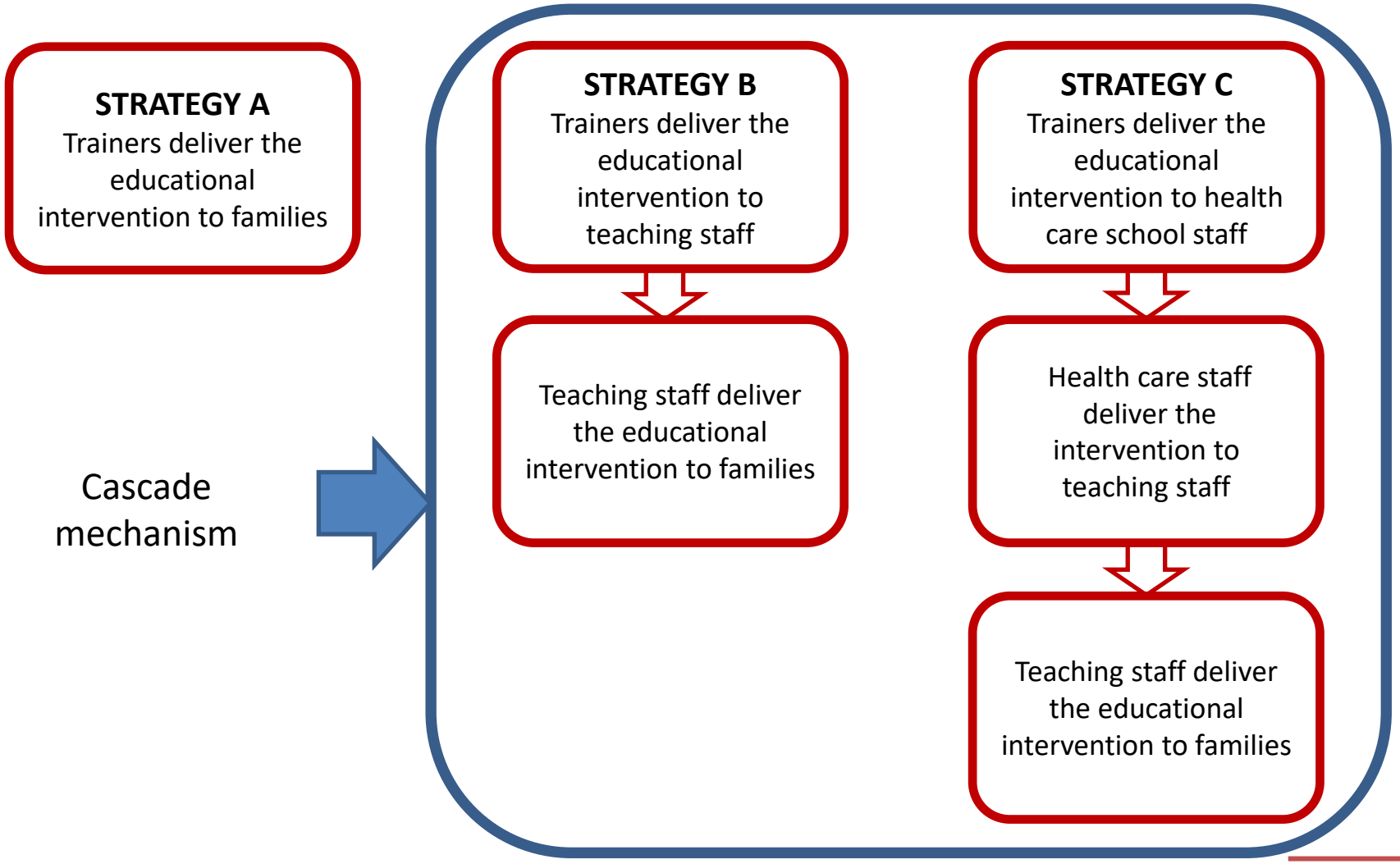
Lorenzoni G, Azzolina D, Baldas S, Messi G, Lanera C, French MA, et al. Increasing awareness of food-choking and nutrition in children through education of caregivers: the CHOP community intervention trial study protocol. BMC Public Health. 2019.

Lorenzoni G, Lanera C, Azzolina D, Baldas S, Messi G, Gregori D. Assessing school-based intervention strategies to foster the prevention of choking injuries in children: The results of the CHOP (CHOking Prevention) trial. Health Soc Care Community. 2021.

STUDY DESIGN



INTERVENTION STRATEGIES



TEACHING INTERVENTION

- A **lecture on primary prevention of food choking** and on nutrition given by experienced trainers
- **Training on maneuvers to dislodge FBs** (secondary prevention) demonstrated by trainers certified by the Italian Society of Pediatric Emergency Medicine (SIMEUP)
- **Distance education via a Massive Open Online Course (MOOC)** to reinforce the lecture content

ASSESSMENT OF EFFECTIVENESS

BASELINE

- socio-demographic questionnaire
- questionnaire about baseline knowledge on food choking prevention

IMMEDIATELY AFTER THE EDUCATIONAL INTERVENTION (POST)

- questionnaire to obtain data relating to knowledge about taught material
- skill test: checklist to evaluate participants' ability to perform maneuvers to dislodge FBs

1-MONTH AFTER THE EDUCATIONAL INTERVENTION (FOLLOW-UP)

- questionnaire to obtain data relating to knowledge about taught material

Participants the control group completed only once a telephone-administered questionnaire

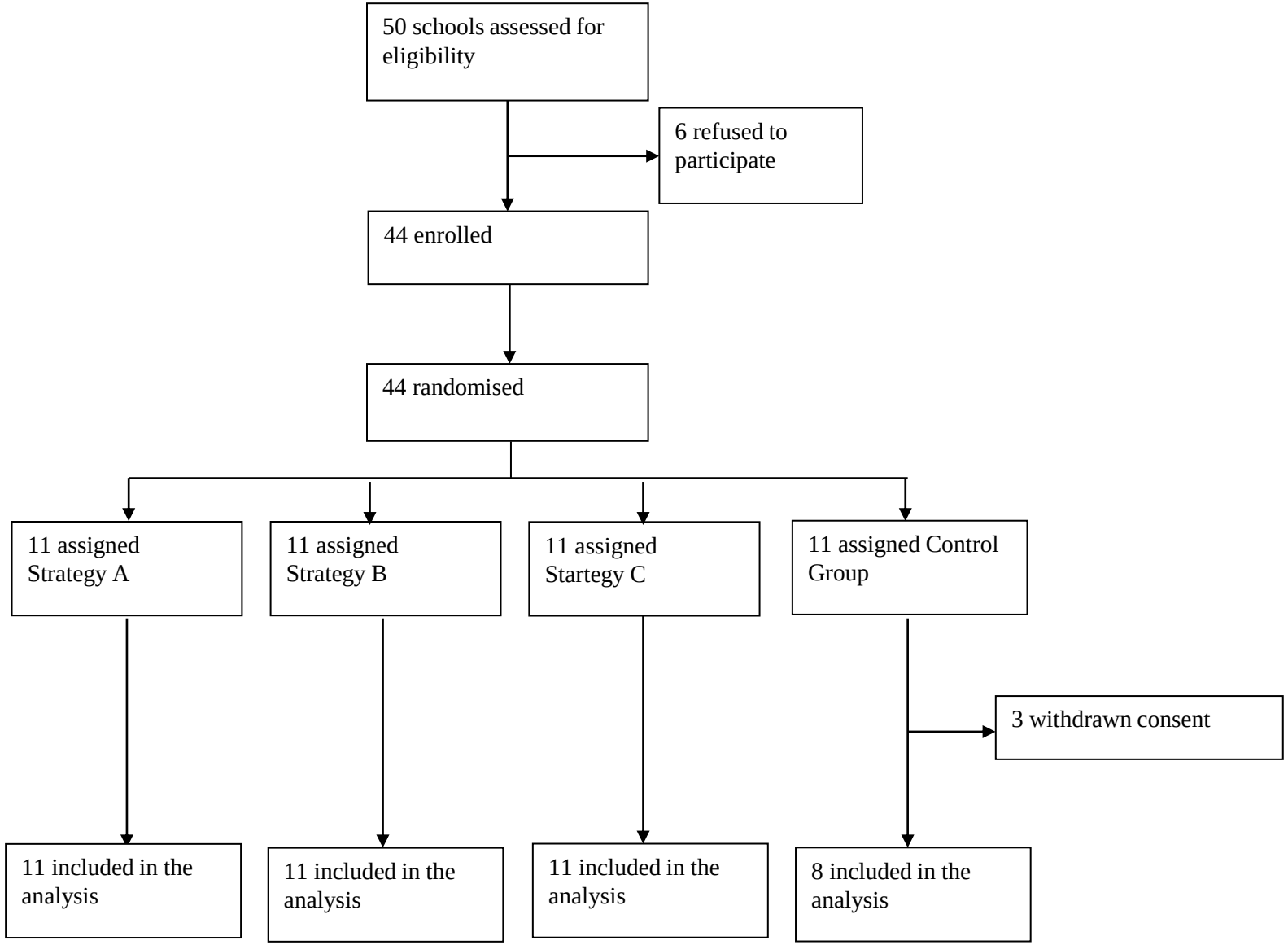
OUTCOMES

Indicator	Topic	Question	Weight of question
1	**Epidemiological knowledge**	Do you know why children are at risk of choking?	0.33
		At what age are children at highest risk of choking?	0.33
		How many deaths per year are estimated to result from foreign body injuries in EU countries in children between 0 and 14 years of age?	0.33
2	**Risk Perception**	Are magnets, if swallowed in numbers greater than one, dangerous?	0.15
		What objects are most frequently involved in foreign body injuries?	0.35
		What objects cause the most serious and fatal injuries?	0.35
		Why are button batteries dangerous if ingested?	0.15
3	**Rules for food preparation**	When should it be assumed that a child has inhaled a foreign body, and what should be done?	0.1
		What size should food be prepared to?	0.1
		How should we prepare and cook meat and fish to reduce the risk of choking and injury?	0.3
		How should you cut wurstel and hot dogs?	0.3
		What should children do during meals and when eating?	0.1
		Do particular food preparation techniques help to reduce the risk of choking?	0.1
4	**Ability to recognize hazardous foods**	Which food represents a high risk of choking to children?	0.4
		Why is food of a round shape hazardous?	0.4
		Why do we have to give babies nuts in a ground form incorporated to other foods with a soft consistency (e.g., yogurt)?	0.1
		At what age can children be given candies and sweets?	0.1

RESULTS

Trials participants:

- 41 schools
- 1426 subjects



	N	Strategy A (N=298)	Strategy B (N=474)	Strategy C (N=491)	Control group (N=163)
School type	1311				
Nursery		38% (112)	31% (146)	40% (196)	27% (13)
Pre-school		40% (119)	32% (152)	25% (122)	25% (12)
Primary school		22% (67)	37% (176)	35% (173)	48% (23)
Gender	1116				
Female		82% (213)	92% (366)	87% (289)	63% (79)
Male		18% (48)	8% (33)	13% (42)	37% (46)
Age	1115				
> 45		18% (46)	24% (96)	27% (90)	17% (21)
18-35		26% (68)	27% (106)	29% (97)	42% (52)
36-45		56% (148)	49% (194)	44% (145)	42% (52)
Marital status	1110				
Single		4% (11)	12% (46)	12% (38)	38% (48)
Married		83% (213)	75% (298)	75% (248)	41% (51)
Widowed		0% (0)	1% (4)	1% (3)	0% (0)
Divorced		4% (10)	4% (14)	3% (9)	7% (9)
Domestic partner		9% (24)	9% (35)	10% (32)	14% (17)
Educational level	1110				
University		55% (143)	31% (122)	47% (154)	30% (38)
Primary education		1% (3)	2% (8)	1% (2)	0% (0)
Secondary education		43% (112)	67% (267)	53% (174)	70% (87)
Job	938				
Manager		3% (7)	0% (1)	3% (7)	2% (2)
Office worker		43% (102)	40% (130)	46% (124)	45% (49)
Indipendent contractor		29% (68)	13% (41)	19% (50)	14% (15)
None		22% (52)	42% (136)	28% (75)	26% (29)
Worker (factory)		3% (7)	5% (15)	5% (13)	14% (15)
Choking episodes in children	1004				
Yes		17% (41)	25% (87)	16% (50)	14% (16)
No		83% (199)	75% (256)	84% (257)	86% (98)

DISTRIBUTION OF THE INDICATORS (post)

	N	Startegy A (N=298)	Startegy B (N=474)	Strategy C (N=491)	Control group (N=163)	P-value (A vs. Controls)	P-value (B vs. Controls)	P-value (C vs. Controls)
Risk perception	948	0.9±0.2	0.9±0.2	0.9±0.1	0.7±0.2	0.001	0.001	0.001
Rules for food preparation	1020	0.93±0.11	0.96±0.07	0.97±0.07	0.88±0.17	0.03	0.001	0.001
Ability to recognize hazardous foods	1031	0.97±0.08	0.95±0.11	0.98±0.06	0.59±0.10	0.001	0.001	0.001
Epidemiological knowledge	842	0.7±0.2	0.6±0.2	0.6±0.2	0.5±0.2	0.001	0.02	0.05

DISTRIBUTION OF THE INDICATORS (follow-up)

	N	Strategy A (N=298)	Strategy B (N=474)	Startegy C (N=491)	Control group (N=163)	P-value (A vs. Controls)	P-value (B vs. Controls)	P-value (C vs. Controls)
Risk perception	717	0.9±0.2	0.9±0.2	0.9±0.2	0.7±0.2	0.004	0.004	0.004
Rules for food preparation	750	0.91±0.09	0.94±0.08	0.93±0.11	0.88±0.17	0.4	0.6	0.4
Ability to recognize hazardous foods	776	0.57±0.09	0.58±0.07	0.57±0.08	0.59±0.10	0.4	1	0.5
Epidemiological knowledge	502	0.5±0.1	0.5±0.2	0.5±0.1	0.5±0.2	0.2	0.933	0.5

ADJUSTED ANALYSIS OF THE INDICATORS (post)

	Estimate	Standard Error	P-value
Risk perception			
Strategy A	0.174	0.038	<0.001
Strategy B	0.208	0.037	<0.001
Strategy C	0.217	0.037	<0.001
Gender: Male	-0.039	0.019	0.04
Educational level: Primary school	-0.115	0.049	0.018
Educational level: Secondary school	-0.007	0.014	0.623
Rules for food preparation			
Strategy A	0.014	0.020	0.47
Strategy B	0.045	0.019	<0.001
Strategy C	0.050	0.019	<0.001
Ability to recognize hazardous foods			
Strategy A	0.405	0.021	<0.001
Strategy B	0.386	0.021	<0.001
Strategy C	0.415	0.021	<0.001
Educational level: Primary school	-0.103	0.029	<0.001
Educational level: Secondary school	-0.003	0.008	0.7175
Children had choked: No	0.023	0.009	0.007
Epidemiological knowledge			
Strategy A	0.243	0.078	0.001
Strategy B	0.144	0.077	0.062
Strategy C	0.149	0.078	0.055

* only significant effects (p-value <0.05) are reported in the table

ADJUSTED ANALYSIS OF THE INDICATORS (follow-up)

	Estimate	Standard error	P-value
Risk perception			
Strategy A	0.175	0.047	<0.001
Strategy B	0.178	0.046	<0.001
Strategy C	0.174	0.046	<0.001
Gender: Male	-0.090	0.027	<0.001
Job: Office worker	-0.079	0.058	0.173
Job: Independent contractor	-0.073	0.059	0.217
Job: None	-0.157	0.061	0.010
Rules for food preparation			
Strategy A	-0.019	0.021	0.37
Strategy B	0.015	0.020	0.47
Strategy C	0.006	0.020	0.76
Ability to recognize hazardous foods			
Strategy A	0.006	0.018	0.732
Strategy B	0.012	0.018	0.510
Strategy C	0.010	0.018	0.589
Marital status: Married	-0.028	0.015	0.065
Marital status: Widowed	-0.097	0.077	0.210
Marital status: Divorced	-0.069	0.024	0.004
Marital status: Domestic partner	-0.044	0.018	0.020
Epidemiological knowledge			
Strategy A	0.039	0.049	0.43
Strategy B	-0.003	0.048	0.95
Strategy C	0.010	0.049	0.84

* only significant effects (p-value <0.05) are reported in the table

TAKE-HOME MESSAGE

The hypothesis underlying the study was that the three interventions would be equally effective in front of a higher sustainability of Strategy C

- Present findings are proving such hypothesis, showing that **a sustainable school-based intervnetion mediated by teachers is as effective as direct training for families**
- Difficulties observed in the retention of knowledge are recommending specific attention to the background material and communication methods employed

The intervention would be a working model to be implemented also outside of Italy in order to further reduce the burden of food choking injuries in children

THANKS!