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ORIGINAL

EDUCATIONAL INTERVENTION ON NUTRITIONAL, HYGIENE AND HEALTH HABITS OF ELEMENTARY STUDENTS

INTERVENCIÓN EDUCATIVA SOBRE HáBITOS NUTRICIONALES, HIGIENE Y SALUD EN ALUMNOS DE PRIMARIA

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ABSTRACT

This is an educational research study based on classroom intervention involving 6-9 years-old students (i.e. 1st cycle of Compulsory Primary Education in Spain). This study aims mainly to verify possible changes in food ingestion, daily activities and hygiene and health habits of healthy boys and girls in a summer camp. To this end, we carried out two educational interventions, including three evaluations consisting of a pre-intervention and two other evaluations after every educational intervention. The results show that these interventions were effective and improved, in general, the habits, daily hygiene and health activities of children participating in the summer camp.

KEYWORDS: Children, Educational intervention, Nutritional behaviour, Family, Physical activity.

RESUMEN

El trabajo que se presenta es una investigación educativa fruto de una intervención en un espacio físico-deportivo con estudiantes de 6 a 9 años (1º Ciclo de Educación Primaria). El objetivo fundamental ha sido averiguar los posibles cambios en la ingesta de alimentos, en las actividades diarias y en los hábitos de higiene y salud, en niños y niñas sanos en un campus de verano. Para ello realizamos dos intervenciones educativas, que incluían tres evaluaciones, una preintervención y dos evaluaciones más después de cada intervención educativa. Los resultados muestran que las intervenciones realizadas han sido efectivas y han mejorado, en general, los hábitos en las actividades diarias, de higiene y de salud de los niños participantes en el campus.

PALABRAS CLAVE: Niños, Intervención educativa, Conducta alimentaria, familia, Actividad física.

1. INTRODUCTION

There is scientific evidence that a number of risk factors of chronic diseases originate in childhood and adolescence (Moreno et al., 2007). Many studies involving children and teenagers reveal that the lack of physical exercise, hygiene and good nutritional habits causes pathological or pre-pathological conditions (Chillón, et al., 2010; Jiménez Pavón, et al., 2010; De Bourdeaudhuij, et al., 2010).

Numerous studies show that a high percentage of children fail to have adequate nutritional habits (Hurson y Corish 1997, Savige et al., 2007) as well as physical activity (Strong et al., 2005). Both factors clearly favour the existence of a high percentage of overweight and obese children and teenagers (Serra et al., 2003). In this respect, there is a clear connection between obesity, diabetes and many heart diseases (Lobstein, 2004; Ara, et al., 2009). Most experts agree on the importance to reduce sedentary behaviour (tv, computer, etc.) (Strong et al., 2005) and acquire healthy habits like dental hygiene (Alm et al., 2007) and solar protection (Witt et al., 2010).

While there are many studies that demonstrate that a high percentage of children fail to have adequate nutritional, exercise and hygiene habits, there is an alarmingly low number of studies addressed to determine preventive strategies and their effectiveness in contexts exposed to educational intervention.

Introducing preventive and educational measures at an early age may slow down the appearance of obesity, as well as many other related physical and psychological complications (Burke, et al., 2003; Ara, et. al., 2006; Reynolds and Spruijt-Metz 2006). However, the results of most interventions aiming to prevent obesity in childhood through dieting, physical activity and/or lifestyle changes and social support have proved poorly effective (Kain, et al., 2008; Martínez Vizcaíno, et al., 2008; Summerbell et al., 2005, Sahota et al., 2001). Most studies are short-lived and the improvements found are hardly significant; still, a few cases show positive results as regards overweight, nutritional habits and physical activity (Martínez Vizcaíno et al. 2008, Doak et al., 2006).

Using inadequate educational material may be one of the reasons behind the poor effectiveness of the interventions regarding the acquisition of healthy habits. Educational health habits for children and adolescents must follow a model different to that applied to adults. For example, such habits should avoid the policy of prohibiting certain foods and promote, instead, the policy of learning the recommended amount of food and raising one's own awareness as regards physical exercise. In this line, to our knowledge, the first "Healthy lifestyle guide pyramid" for children and adolescents is the only one that has been properly developed (González-Gross 2008) and its effectiveness was tested in one single study (Ruiz et al., 2009). This study, though, was limited in scope due to the poor number of subjects and the absence of a control group.

The present study aims to quantify the long- and short-term effectiveness of healthy habits of children involved in an educational intervention programme consisting of a presentation and explanation of the “Healthy lifestyle guide pyramid”.

2. METHODOLOGY

Participants

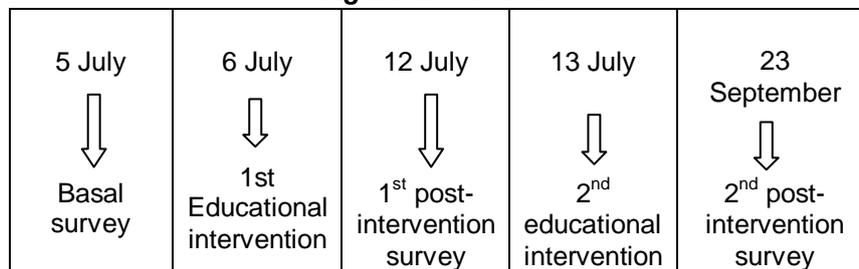
A total of 102 subjects (8.1 ± 0.9 years old, 74% boys) enrolled in the summer football camp of Peñíscola (2010) took part in the study. None of them had any learning difficulties or behavioural problems.

Design

A prospective longitudinal study was conducted consisting of a previous assessment and two subsequent assessments of two educational interventions (figure 1). Prior to this, the campus principal had given his consent to the work plan. The children were randomly distributed between the experimental group ($n = 72$) and the control group ($n = 30$). The control group was only told about the frequency which they had to attend the centre to carry out the survey.

At the beginning of their stay at the camp, both the experimental and control groups were probed on their nutritional habits, daily activities and health (Ruiz et al., 2009). On the next day, the experimental group went through their first educational intervention. Seven days later, both groups (i.e. experimental and control) answered again the basal survey in an attempt to study short-term changes. On the next day, a new educational ‘booster’ intervention was done on the experimental group containing the same characteristics as the former intervention. After 2 months after the summer camp finished, both the experimental and control groups were again subjected to the same survey to verify any long-term changes.

Figure 1. Flowchart



Intervention

The intervention was done in groups of 10 boys in 2 sessions of 50 minutes consisting of presentation, debate and conclusions of the “Healthy lifestyle

guide pyramid” designed for children and adolescents (González-Gross et al., 2008). The pyramid has four faces, each face oriented towards achieving a different goal; namely, daily food intake, daily activities, traditional food guide pyramid adapted to children’s and adolescents’ energy, nutritional and hydration needs, daily and lifelong habits and health. On the base of the pyramid, there is advice about adequate nutrition alternating with advice about physical activity and sports.

The role of the instructor varied depending on the stage of each session: describing the pyramid, arguing and explaining its contents, moderating and dynamizing the debates, focussing one’s attention on specific aspects, asking questions and conceptualizing answers.

At the end of the first intervention, all children were handed out photocopies of the “Healthy lifestyle guide pyramid”, so that they could not only read it but also talk about it with their parents. Ultimately, this was aimed to increase the impact of this information.

The survey and the research design were passed and approved by the Committee of Biochemical Ethics of the Government of Aragon.

Statistical analysis.

The statistical analysis was implemented with the programme Statistical Package for Social Sciences, Version 15.0. The data were expressed as percentages. The Chi-square and Fisher tests were applied in order to establish differences between the experimental and control groups and also to monitor changes over time of both groups for the variables analyzed. The α level was established at 0.05.

3. RESULTS

The number of children evaluated in the basal survey and the first post-intervention was 102. This number decreased to 98 and 90 children, respectively, in the second and third post-intervention survey.

Table 1 shows the results obtained for nutritional habits. Before the first educational intervention, no significant differences in food intake were appreciated between the experimental and control groups. Both groups had a high percentage of subjects (~70-80) who used to eat butter, cold meats and sweet things; by contrast, their consumption of cereals, fruit and nuts is inadequate. The experimental group, after the first intervention, showed a significant reduction in the intake of whole milk, cold meats and sweet things; likewise, there was an increase in fruit and cereal consumption ($p < 0.001$). The changes in fruit and cereal consumption were not maintained after the second intervention. None of the two interventions resulted in changes in their

consumption of butter and nuts. The control group showed no significant changes whatsoever.

Table 1 Percentage of food consumption prior to the intervention with the first and second post-intervention survey

	<i>1st pre-intervention survey</i>		<i>2nd post-intervention survey</i>		<i>3rd post-intervention survey</i>	
	<i>Intervention group n = 72</i>	<i>Control group n = 30</i>	<i>Intervention group n = 70</i>	<i>Control group n = 28</i>	<i>Intervention group n = 68</i>	<i>Control group n = 26</i>
Whole milk	60	57	24*	57	25*	58
Butter	79	73	71	71	69	69
Cold meats	79	80	21*	86	29*	81
Nuts and dried fruit	29	23	33	25	28	23
Fruit	21	20	67*	21	28	19
Breakfast cereal	7	10	56*	11	54*	12
Sweet things	81	83	21*	82	71	81

Data expressed as percentages.

* Significant differences from the data observed in the 1st pre-intervention survey.

The results of daily hygiene and health activities are shown in Table 2. Prior to the intervention, no significant differences between the experimental and control group were observed. For both groups, a high percentage of subjects (~80.90%) declared that they washed their hands before eating and brushed their teeth afterwards (83-88%). Only significant changes were observed on the bathing time after eating, both in the experimental group (short-and long-term), and the control group (long-term) ($p < 0.001$).

Table 2 Percentage of daily hygiene and health activities, prior to the intervention with respect to the first and second post-intervention survey

	<i>1st pre-intervention survey</i>		<i>2nd post-intervention survey</i>		<i>3rd post-intervention survey</i>	
	<i>Intervention group n = 72</i>	<i>Control group n = 30</i>	<i>Intervention group n = 70</i>	<i>Control group n = 28</i>	<i>Intervention group n = 68</i>	<i>Control group n = 26</i>
Washing hands before meals	81	80	89	79	88	81
Sunbathing with no protection	50	53	53	54	40	54
Bathing after eating on the beach	49	50	9*	46	7*	12*
Brushing teeth	88	83	91	82	90	92

Data expressed as percentages.

* Significant differences from the data observed in the 1st pre-intervention survey.

For both experimental and groups, there was a long-term significant reduction in hours of television exposure ($p < 0.05$). Additionally, for the experimental group, there was a significant increase of physical activity in the short- ($p = 0.014$) and in the long term ($p = 0.002$) (Table 3).

Table 3 Percentage of frequency of daily hygiene and health activities prior to the intervention with respect to the first and second post-intervention survey

	<i>1st pre-intervention survey</i>		<i>2nd post-intervention survey</i>		<i>3rd post-intervention survey</i>	
	<i>Intervention group n = 72</i>	<i>Control group n = 30</i>	<i>Intervention group n = 70</i>	<i>Control group n = 28</i>	<i>Intervention group n = 68</i>	<i>Control group n = 26</i>
Television > 15 hrs./week (hours)	93	90	83	89	52*	54*
Sport > 5 hrs./week (frequency)	72	73	89*	71	93*	89

Data expressed as percentages.

* Significant differences from the data observed in the 1st pre-intervention survey.

4. DISCUSSION

Educational interventions at school age can be an adequate way of acquiring healthy habits to prevent obesity and heart diseases. This study is the first control study aiming to determine the efficiency on children's healthy habits of an educational programme consisting of a presentation and explanation of the "Healthy lifestyle guide pyramid". The results show the effectiveness of intervention with significant changes in some healthy habits.

As regards daily nutritional habits, it is worth noting the high number of subjects who, in the basal survey, showed a consumption of whole milk, butter, cold meats and sweet things, as well as a low percentage of adequate consumption of fruits and cereals. These data validate previous findings of studies that used the same measuring instrument (Ruiz et al., 2009), and many other similar studies (Martinez-Gomez, et al., 2010; Moliner-Urdiales, et al., 2010a; Gracia-Marco, et al., 2010). They are alarming and indicate that, in practice, parents are still unaware of the fact that adequate nutrition at an early age prevents obesity and heart diseases in adulthood. Probably these results are in line with the high percentage of children and youngsters with overweight and obesity problems (Serra, et al., 2003; Lobstein, 2004).

Our intervention programme had positive effects on a few nutritional habits. To be specific, there was a short- and long-term reduction in the consumption of whole milk and cold meats as well as an increase in cereal consumption. Probably the immediate effect of the first intervention stems from the simple and easy comprehension of the educational material handed out, as well as the simplicity of modifying shopping habits. A higher probability of eating with the family during the summer period accounts in part for the success in consumption changes. This fact has been validated by previous studies, which highlight its positive effect on positive nutritional habits (Gillman et al., 2000; Kusano-Tsunos et al., 2001). In this respect, it seems clear that parents were aware of the importance of having adequate nutritional habits.

However, we ignore the reason why our educational intervention programme had no positive effects on butter consumption. This is an aspect we need to delve into further, as excess consumption of butter and dairy products increases body fat, which in turn is linked to lower cardiovascular fitness (Moliner-Urdiales, et al., 2010b).

Another aspect worth looking into is the fact that, like the only previous study sharing similar characteristics (Ruiz et al., 2009), the immediate positive effect of an increase in fruit consumption and a decrease in sweet things consumption was not stabilized 2 months after the summer campus came to an end. These results indicate that the intervention had positive effects which were not maintained over time, due to either problems related to the educational material or, in all likelihood, seasonal effects linked to changes in lifestyle routines.

As regards daily hygiene and health activities, we observed that, like in previous studies (Gonzalez, 1996; Angora, et al., 2002), before the intervention programme, a high number of subjects already had positive habits as regards hand-washing (81%) and teeth-brushing (86%). These data contrast with the low percentage of subjects who already had other healthy habits, like no bathing after meals (50%) and no sunbathing without sun cream (51%). These results may be interesting for both educational institutions and professionals, to raise awareness and educate on these habits. At this point, it needs to be said that our intervention programme had a positive effect on such habits as no bathing after meals, yet no positive effect on others as no sunbathing without sun cream. These data are quite alarming as numerous studies prove that a high number of skin pathologies are caused by the sun's rays (Witt et al., 2010). The lower percentage of time dedicated to raising awareness to the importance of sunbathing with sun protection and the financial cost of buying sun-protection creams may be two of the reasons behind these results. They should therefore be taken into consideration in future educational programmes.

Several studies reveal that a few leisure activities like practising sports, unlike other sedentary behaviours (e.g. watching television, listening to music, etc.) prevent us from harmful habits like smoking (Sasco, et al., 2003; Laure et al., 2008). Unfortunately, our intervention programme proved unsuccessful in reducing short-term television exposure. However, both the control and experimental groups showed a significant decrease in their hours of television exposure after the second intervention. This is in all probability due to the beginning of the academic year rather than to the effectiveness of our educational programme. Still, the educational programme did have immediate effects on the percentage of subjects doing more physical activity. These results can be considered as highly positive, as increased physical and sports activities contribute to preventing obesity (Ara, et al., 2007; Strong y cols. 2005), and heart diseases (Lobstein, 2004), increasing bone mass (Vicente-Rodriguez, et al., 2005) and even improving academic performance (Daley y Ryan 2000).

5. CONCLUSIONS

Our results demonstrate that an educational intervention consisting of a presentation and explanation of the "Healthy lifestyle guide pyramid" can lead, in the context of a summer camp, to significant short- and long-term changes in healthy habits of children aged 6-9. This can contribute to waive risk factors of diseases in adulthood. The implementation of similar educational interventions in other contexts, e.g. more subjects and tighter control of external factors like seasonal changes and family routines, deserves further research in the future.

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