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Editorial | Editorial | Editorial

A revista Millenium - Journal of Education, Technologies, and Health é "uma publicação periódica de vocação e âmbito multidisciplinar", tal como é referido na sua política editorial, afirmando-se como um projeto único, definido e com objetivos próprios, com publicação de artigos oriundos das várias áreas disciplinares.

A opção pela multidisciplinaridade evita a compartimentação, levando a uma abertura de horizontes empíricos e conceituais, favorecendo as trocas informacionais, ultrapassando fronteiras disciplinares na produção e disseminação do conhecimento científico. Nesta perspetiva, pretende-se que a Millenium se assuma como um veículo de transmissão do conhecimento, proveniente dos diversos domínios científicos, de uma forma integrada, inovadora e não compartimentada e que permita a criação de sinergias interdisciplinares.

O conhecimento científico consolida-se, aprofunda-se e expande-se na confluência de diversos saberes, na sua interação e complementaridade. Atualmente, nos programas de apoio à investigação e no reforço das ligações entre o ensino superior/ economia e sociedade, cada vez mais se incentivam equipas com diversidade de bases disciplinares distintas potenciando, assim, resultados mais sólidos, consistentes e abrangentes.

A multidisciplinaridade e interdisciplinaridade potenciam a diversidade, proporcionando aos investigadores um ambiente favorável à troca de saberes e favorecendo o conhecimento de perspetivas complementares às suas, o que levará certamente, ao incremento da criatividade e à procura de novas questões, novos rumos e novas respostas.

É neste contexto que a Millenium se enquadra, demonstrando em mais uma edição deste Journal que a multidisciplinaridade é necessária e possível e que pode ser estimulada através do desenvolvimento duma nova cultura científica de interação entre as diversas áreas do conhecimento.
Após avaliação cega, o presente número, integra 10 artigos, cuja versatilidade temática compreende a dimensão multidisciplinar que se pretende proporcionar a este periódico que tem como foco as ciências da vida e da saúde, agrárias, alimentares e veterinárias, educação e desenvolvimento social, e das engenharias, tecnologia, gestão, turismo e artes.

A Equipa Editorial
Madalena Cunha, José Luís Abrantes, Maria João Amante, José Paulo Lousado, Paula Correia

Millenium - Journal of Education, Technologies, and Health is "a periodical publication with a multidiciplinary purpose and mission", as mentioned in its editorial policy, consolidating its position as a unique, defined Project with its own objectives, publishing articles from various subject.

Its multidisciplinarity avoids compartimentation, opening up empirical and conceptual horizons, favouring information exchange and overcoming disciplinary boundaries when producing and disseminating scientific knowledge. In this perspective, Millenium will act as a vehicle for the transmission of knowledge, which stems from diverse scientific domains, in a non-compartmentalized, innovative and integrative way that allows the creation of interdisciplinary synergy.

Scientific knowledge is consolidated, deepened, and expanded by the confluence of different areas that interact and complement themselves. Currently, in investigation support programs and by reinforcing the connection between higher education, economy and society, teams with different disciplinary bases are increasingly supported in a way to strengthen more consistent and more comprehensive results.

Multidisciplinarity and interdisciplinarity increases diversity, allowing establishing among investigators an environment favourable to the exchange of knowledge and development of complementary perspectives, which certainly lead to the increase in creativity and the search for new questions, new paths and new answers.

It's in this context that Millenium emerges, demonstrating in another edition of this Journal that multidisciplinarity is necessary and possible and that it can be stimulated by developing a new scientific culture of interaction between the different areas of knowledge.
After blind evaluation, the present number integrates 10 articles, whose thematic versatility allow the multidisciplinary dimension intended for this periodical that has life and health, agrarian, alimentary and veterinary sciences, education and social development, engineering, technology, management, tourism and arts as its focus.

The Editorial Board
Madalena Cunha, José Luís Abrantes, Maria João Amante, José Paulo Lousado, Paula Correia

La revista Millenium - Journal of Education, Technologies, and Health es "una publicación periódica de vocación y ámbito multidisciplinar", tal como se refiere en su política editorial, afirmándose como un proyecto único, definido y con objetivos propios, con publicación de artículos originarios de las varias áreas disciplinarias.

La opción por la multidisciplinariedad evita el fraccionamiento, llevando a una apertura de horizontes empíricos y conceptuales, favoreciendo los intercambios comerciales, superando fronteras disciplinarias en la producción y diseminación del conocimiento científico. En esta perspectiva, se pretende que la Millenium se asuma como un vehículo de transmisión de conocimiento, proveniente de diversos dominios científicos, de una forma integrada, innovadora y no compartimentada y que permita la creación de sinergias interdisciplinarias.

El conocimiento científico se consolida, se profundiza y se expande en la confluencia de diversos saberes, en su interacción y complementariedad. Actualmente, en los programas de apoyo a la investigación y en el refuerzo de las conexiones entre la enseñanza superior/economía y sociedad, cada vez más se incentivan equipos con diversidad de bases disciplinarias distintas, potenciando, de esa manera, resultados más sólidos y amplios.

La multidisciplinariedad e interdisciplinariedad desarrollan la diversidad, proporcionando a los investigadores un ambiente favorable al intercambio de saberes y favoreciendo el conocimiento de perspectivas complementarias a las suyas, lo que llevará, seguro, al incremento de la creatividad y a la búsqueda de nuevas cuestiones, nuevos rumbos y nuevas respuestas.

Es en este contexto que la Millenium se enmarca, demostrando en una edición más de este Journal que la multidisciplinariedad es necesaria y posible y que puede ser animada a través del desarrollo de una nueva cultura científica de interacción entre las diversas áreas del conocimiento.
Después de evaluación ciega, el presente número integra 10 artículos en que la versatilidad temática incluye la dimensión multidisciplinaria que se pretende proporcionar a este periódico, que tiene como enfoque las ciencias de la vida y de la salud, agrarias, alimentarias y veterinarias, educación y desarrollo social, y de las ingenierías, tecnología, gestión, turismo y artes.

El Equipo Editorial
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Millenium, 2(2), 13 -25.

EFEITO MODERADOR DOS ESTILOS PARENTAIS NA RELAÇÃO ENTRE ANSIEDADE SOCIAL E SINTOMATOLOGIA DEPRESSIVA NOS ADOLESCENTES

THE MODERATING EFFECT OF PARENTING STYLES ON THE RELATIONSHIP BETWEEN SOCIAL ANXIETY AND DEPRESSIVE SYMPTOMATOLOGY IN ADOLESCENTS

EFECTO MODERADOR DE LOS ESTILOS PARENTALES EN LA RELACIÓN ENTRE ANSIEDAD SOCIAL Y DEPRESIÓN EN ADOLESCENTES

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Study of the moderating effect of parenting styles on the relationship between social anxiety and depressive symptomatology in adolescents.
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RESUMO

Introdução: A comorbilidade entre ansiedade social e depressão é elevada na adolescência. Os estilos parentais de socialização emocional têm-se mostrado associados ao desenvolvimento de competências sociais e de sintomatologia depressiva.

Objetivos: Este estudo pretende explorar o efeito moderador dos estilos parentais na relação entre ansiedade social e depressão na adolescência, as associações existentes entre estas últimas variáveis, e a relação entre estilos parentais e sintomatologia ansiosa e depressiva nos filhos.

Métodos: A amostra é constituída por 121 pais e respetivos filhos. A natureza do presente estudo é correlacional e transversal. Recorreu-se a instrumentos de autorresposta para avaliar a ansiedade social (MASQ, March, et al. 1997; versão Portuguesa: Salvador et al., 2015), a sintomatologia depressiva (CDI, Kovacs, 1985; versão Portuguesa: Marújo, 1994) e os estilos parentais (PSST, Gottman & Declaire, 1997; versão Portuguesa: Matos, Costa, Pinheiro, Silva, & Marques, 2016).

Resultados: Verificou-se que a ansiedade social se associou significativamente com depressão e que apresentou um efeito preditor sobre a mesma. Os estilos parentais não revelaram associações significativas quer com sintomatologia depressiva, quer com ansiedade social. Porém, encontrou-se um efeito moderador do estilo parental explorador na relação entre ansiedade de desempenho público e sintomatologia depressiva.

Conclusões: A presente investigação confirmou a existência de uma associação significativa entre ansiedade social e sintomatologia depressiva na adolescência e sugere um efeito das práticas parentais de socialização emocional nesta relação, que, no entanto, deverá ser replicado em investigações futuras. Será ainda importante estudar o efeito dos estilos parentais nas competências de regulação emocional dos filhos e o possível efeito mediador destas na relação entre ansiedade social e depressão.

Palavras-chave: Ansiedade social; Depressão; Estilos parentais; Moderação; Adolescência

ABSTRACT

Introduction: The comorbidity between depression and social anxiety is high in adolescence. Parental emotion socialization behaviors have been associated with the development of social skills and depressive symptomatology.

Objectives: This study aims to explore the moderating effect of parenting styles on the relationship between social anxiety and depression, to study the associations between them, and to analyze the relationship between parenting styles, social anxiety and depressive symptomatology in adolescents.

Methods: The sample consisted of 121 parents and their children. The nature of the present study is correlational and cross-sectional. Self-report instruments were used to assess social anxiety (MASQ, March, et al. 1997; Portuguese version: Salvador et al., 2015), depressive symptomatology (CDI, Kovacs, 1985; Portuguese version: Marújo, 1994) and parenting styles (PSST, Gottman & Declaire, 1997; Portuguese version: Matos, Costa, Pinheiro, Silva, & Marques, 2016).

Results: It was found that social anxiety is significantly associated to depression and that the former has a predictive effect on the latter. The parenting styles revealed no significant associations with either depressive symptomatology or with social anxiety, but a moderating effect of explorer parenting style was found in the relationship between social anxiety (public performance) and depressive symptomatology.

Conclusions: The present investigation confirmed the existence of a significant association between social anxiety and depressive symptomatology in adolescence and suggests an effect of parental practices of emotional socialization in this relation, which, however, should be replicated in future research. It will also be important to study the effect of parenting styles on children's emotional regulation skills and their possible mediating effect on the relationship between social anxiety and depression.

Keywords: Social Anxiety; Depression; Parenting Styles; Moderation; Adolescence

RESUMEN

Introducción: La comorbilidad entre la ansiedad social y depresión es alta en la adolescencia. Los estilos parentales de socialización emocional han demostrado estar asociados con el desarrollo de competencias sociales y síntomas depresivos.

Objetivos: Este estudio tiene como objetivo explorar el efecto moderador de los estilos parentales sobre la relación entre ansiedad social y depresión en la adolescencia, las asociaciones entre estas variables y la relación entre estilos parentales y síntomas ansiosos y depresivos en los niños.

Métodos: La muestra consistió en 121 padres y sus hijos. La naturaleza de este estudio es correlacional y transversal. Se han utilizado instrumentos de auto-respuesta para evaluar la ansiedad social (MASQ, March, et al., 1997; vérsion Portugués: Salvador et al., 2015), los síntomas depresivos (CDI, Kovacs, 1985; versión Portugués: Marújo, 1994) y los estilos parentales (PSST, Gottman & Declaire, 1997; versión Portugués: Matos, Costa, Pinheiro, Silva, & Marques, 2016).

Resultados: Se encontró que la ansiedad social se asoció significativamente con la depresión y presentó un efecto predictor sobre la misma. Los estilos parentales no revelaron estar significativamente asociados con síntomas depresivos o ansiedad social y no mostraron ser predictores de depresión. No obstante, se encontró un efecto moderador del estilo parental explorador en la relación entre la ansiedad por el desempeño público y los síntomas depresivos.

Conclusiones: Esta investigación confirmó la existencia de una asociación significativa entre la ansiedad social y los síntomas depresivos en la adolescencia y sugiere un efecto de las prácticas parentales de socialización emocional en esta relación, lo cual debe, sin embargo, ser replicado en futuras investigaciones. También será importante estudiar el efecto de los estilos parentales en las competencias de regulación emocional de los hijos y el posible efecto de mediación de estas en la relación entre la ansiedad social y depresión.

Palabras clave: Ansiedad social; Depresión; Estilos parentales; Moderación; Adolescencia

INTRODUCTION

While in childhood the prevalence of depression varies between 0.4% and 2.5%, during adolescence these percentages increase considerably, reaching values between 4% and 24%, (Cummings & Fristad, 2008). According to Abela e Hankin (2008), by the age of 14, 9% of adolescents would have already experienced at least one major depressive episode.

Social anxiety is considered the most frequent anxiety disorder in patients with depression (Belzer & Schneier, 2004), arising both disorders often as comorbid in adolescence (Beidel et al., 2007; Chavira, Stein, Bailey, & Stein, 2004; Ranta, Kaltiala, Rantanen, & Marttunen, 2009).

Some studies begin to show that the meta-emotional philosophies of parents also relate to the emotional experience of adolescents, both as regards to internalizing symptomatology and the development of social competences (Buckholdt, Kitzmann, & Cohen, 2014a; Buckholdt, Parra, & Jobe-Shields, 2014b; Stocker, Richmond, & Rhoades, 2007; Yap, Schwartz, Byrne, Simmons, & Allen, 2010).

The present research aims to study the relationship between depression, social anxiety and parenting styles, as well as the possible moderating effect of parental styles in the relationship between the former.

1. THEORETICAL FRAMEWORK

1.1 Depression in adolescence

Depression disorder is characterized by the presence of depressed humor and anhedonia, although humor, in children and adolescents, could be mainly characterized by irritability (American Psychiatric Association, 2013). In this age group, depressive symptomology also includes loss of energy, hypersomnia, weight gain, feelings of hopelessness and suicidal ideation (Yorbik, Birmaher, Axelson, Williamson, & Ryan, 2004).

Among the impairments most commonly associated with depression in adolescence there are poor school performance, increased conflicts with the family, increased substance use, increased behavioral problems and high risk of suicide (Arnarson & Craighead, 2009; Rao & Cohen, 2009).

According to Essau et al. (2010), the likelihood of new depressive episodes occurring is greater as earlier the onset of depression occurs, thus it becomes urgent to understand the risk factors that predispose its development in adolescence.

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1.2 Social Anxiety and Depression

Social Anxiety Disorder is characterized by severe fear or anxiety in social situations in which the individual is subject to scrutiny from others (APA, 2013). This disorder has a serious impact in the daily functioning of adolescents, particularly at the psychological, social and scholar level, tending to persist throughout their development (APA, 2013; Rao et al., 2007).

Epidemiological studies have found that the percentage of adolescents who have social anxiety in comorbidity with depressive disorders varies between 28% and 41% (Chavira et al., 2004; Essau, Conradt, & Petermann, 1999; Ranta et al., 2009; Wittchen, Stein & Kessler, 1999).

In addition, with regard to the temporal relationship between the two disorders, social anxiety usually precedes the development of depression in adolescence (Aune & Stiles, 2009; Beesdo et al., 2007; Chavira et al., 2004; Dalrymple & Zimmerman, 2011; Stein et al., 2001), suggesting that it is a predictor of depression.

Some studies (Drost, Van denr Does, Van Hemert, Pennix, & Spinhoven, 2014; Grant et al.,2014) have been exploring the role of regulation in the comorbidity between social anxiety and depression, having found that emotional regulation mediates the relationship between these disorders.

It should be noted that the high comorbidity between depression and social anxiety is associated with a severe impairment in functioning, a high probability of relapse and, generally, a poor prognosis (Dalrymple, & Zimmerman, 2007, 2011; Ruscio et al., 2008; Stein et al., 2001).

1.3 Parenting Styles of Emotional Socialization

Meta-emotional philosophy is a concept that concerns the "organized set of feelings and thoughts that parents have about their emotions and those of their children" (Gottman, 1996, p. 243). According to Gottman, the meta-emotional philosophy of parents determines the expression and regulation of their emotions, and is also the basis for the attitudes (e. g., validation, discussion, criticism or rejection) that parents will adopt towards their children's emotional experience.

Gottman and Declaire (1997) propose four parenting styles of emotional socialization. Two of them, emotion-coaching and laissez-faire, are characterized by the acceptance and validation of the negative emotional experience. Nonetheless, while emotion-coaching parents empathize, validate, teach to identify, to regulate and to express emotions appropriately, laissez-faire parents do not set limits to emotional expression and do not teach emotional regulation skills. On the other hand, dismissing and disapproving emotional socialization styles do not accept the negative emotions of the children. Namely, parents trivialize and ignore negative emotional experience, or reject, criticize and reprimand children when they manifest it.

Emotional socialization models (Gottman & Declaire, 1997; Morris, Silk, Steinberg, Myers, & Robinson, 2007), based on meta-emotional philosophies and children, propose that the emotional competence of children mediate the relationship between parental practices. Thus, the theoretical model of meta-emotional philosophy suggests that these have influence on three fundamental aspects of children's emotional competences: emotional awareness, emotional expression and emotional regulation. These emotional competencies seem to be associated with the relationship with peers and children's psychosocial adjustment (Katz, et al., 2012). Several studies (Gottman et al., 1996; Fivush, 2007; Lunkenheimer, Shields, & Cortina, 2007; Ramsden & Hubbard, 2002) have shown that children of parents who accept and guide the experience of negative emotions exhibited more emotional regulation skills and greater emotional awareness. Similarly, children whose parents are emotion-coaching had more social skills and close relationships with peers than parents who are more punitive and dismissing (Fabes, Leonard, Kupanoff, & Martin, 2001; Gottman et al., 1996; Katz & Windecker-Nelson, 2004; Katz, Hunter, & Klowden, 2008).

1.4 Parenting Styles of Emotional Socialization, Social Anxiety, and Depression

In a sample of adolescents with depressive symptomatology, the children of mothers that accept their own emotions presented lower depressive symptomatology (Katz & Hunter, 2007). In a similar sample, Hunter et al. (2010) have also shown that children of mothers who present more emotion-coaching and emotionally awareness display more adaptive and proactive meta-emotional philosophies regarding negative emotional experience. With regard to social skills, studies (Buckholdt, Kitzmann, & Cohen, 2014a; Buckholdt, Parra, & Jobe-Shields, 2014b) have found that a parenting style of emotion-coaching adopted by mothers is associated with greater sociability and respect between peers as well as with an optimistic view of friendships and less loneliness in adolescents. Buckholdt et al. (2014b) also found that a parenting style of emotion-coaching has a protective effect on children's perception of their social skills when poor relationships occur with peers. Studies have shown in

adolescent samples that the invalidation or reprimand of negative emotional expression relates to an increase of internalizing symptomatology (namely, depression) through emotional regulation strategies (Buckholdt et al., 2014; Stocker et al., 2007; Yap et al., 2010).

Since meta-emotional philosophies relate to negative emotionality and emotional regulation, as well as influencing the development of social skills, it is important to study their role in the well-established relationship between social anxiety and depression. Thus, the present research aims to: i) study the associations between social anxiety and depressive symptoms in adolescents; ii) analyze the relationship between parenting styles and anxious symptomatology in children; iii) test the moderating effect of parenting styles on the relationship between social anxiety and depressive symptomatology.

2. METHODS

A correlational and cross-sectional study was developed.

2.1 Participants

The present study sample comprised of 121 students and respective parents who participated voluntarily and anonymously. In the children' group, 94 (77.9%) were female and 27 (22.1%) were male, with ages ranging between 12 and 18 years old (M= 14.08; SD= 0.96). Concerning parents, 107 were female (88.4%) and 14 were males (11.6%), with ages ranging from 34 to 67 years (M= 43.54, SD= 5.78). Regarding the distribution of parenting styles, according to PSST, 95% of the parents were explorers, 3% were accepting and 2% were disapproving.

2.2 Measures

Children's Depression Inventory

CDI (Kovacs, 1985; Portuguese version: Marújo, 1994) is a self-response instrument, composed of 27 items, which evaluates depressive symptomatology in children/adolescents (Dias & Gonçalves, 1999). It is a Likert-type scale classified between 0 ("absence of symptom") and 2 ("definitive symptom").

The instrument showed good internal consistency values (Cronbach's alpha between .83 and .94) for the total scale (Kovacs, 1985). The scale in the Portuguese population presented an *alpha* of .80 (Dias & Gonçalves, 1999; Marújo, 1994) and in the present study of .83.

Multidimensional Anxiety Scale for Children

MASC (March et al., 1997; Salvador et al., 2015) evaluates symptoms of anxiety in children/adolescents. It consists of 39 items divided into 4 factors. The social anxiety factor has as sub factors humiliation/rejection and public performance. It is scored with a Likert-type scale, ranging from 0 ("never true") to 3 ("often true").

Alpha coefficient obtained in the original scale for the total scale and sub factors ranged from .84 to .90 (March et al., 1997). In the Portuguese version (Salvador et al., 2015) the Alpha coefficient obtained for the total scale was .89, .85 for the social anxiety factor, with .86 and .69 for the humiliation/rejection and public performance sub factors, respectively. In the present study, only social anxiety factor and the sub-factors humiliation/rejection and public performance were used, obtaining respectively an alpha of .85, .87 and .70.

Parenting Styles Self-Test

PSST (Parenting Styles Self-Test, Gottman & Declaire, 1997; Portuguese version: Matos, Costa, Pinheiro, Silva, & Marques, 2016) is a self-report instrument that aims to evaluate parenting styles of emotional socialization of sadness and anger (Gottman, 1997). The instrument is composed of 48 items divided into 3 factors: disapproving, explorer, and accepting parenting style. Response format is dichotomous (True/False).

The Portuguese version of PSST showed good values of *Alpha* (disapproving= .87, explorer= .85). Only the accepting style did not present such high internal consistency (α= .71). In the present study, the *Alpha* coefficients obtained for the disapproving, explorer and accepting parenting style were, respectively, .82, .72 and .67.

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2.4 Procedure

The National Data Protection Commission and the ethics committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra approved this study.

Confidentiality was assured and the participants were asked to sign an informed consent. The parental assessment protocol was sent to be completed at home while the students completed the instruments at school.

Associations between variables were analyzed by Pearson's test, using Pestana and Gageiro's (2005) criteria to interpret the correlation coefficients. Thus, a correlation coefficient less than .20 indicates as a very low association between the variables; a value between .21 and .39 a low association; between .40 and .69 moderate; between .70 and .89 high; and more than .90 very high.

In order to explore the predictive effect of social anxiety and parenting styles on depressive symptomatology, a multiple linear regression was performed.

The moderating effect of parenting styles on the relationship between social anxiety and depressive symptomatology was tested through multiple hierarchical regression models, where the depressive symptomatology (CDI) was established as a criterion variable. The independent and moderating variables were standardized, allowing a reduction of possible multicollinearity issues (Marôco, 2010). The interaction term was created by multiplying the predictor variable (MASQ) and the moderating variable (PSST). In regressions, the predictor variable was first introduced, followed by the moderating variable and, finally, the interaction between the two, as suggested by Baron e Kenny (1986).

All statistical procedures were performed using SPSS program (Statistical Package for the Social Sciences - version 22) for Windows.

3. RESULTS

3.1 Preliminary Data Analysis

The normality of the data was evaluated by using the *Kolmogorov-Smirnov test,* which showed a normal distribution for depressive symptomology (K-S, p> .05) and a non-normal distribution for the remaining variables K-S, p< .05). However, when analyzing the bias in relation to the mean, acceptable values of asymmetry <| 3 | and kurtosis <| 10 | were obtained (Kline, 2011). The adequacy of the data to perform a multiple hierarchical regression was confirmed.

3.2 Study of the associations between social anxiety, parenting styles and depressive symptomatology

Pearson's correlation coefficients revealed that social anxiety (r= .40, p= .000), humiliation/rejection anxiety (r= .34, p= .000), and public performance anxiety (r=. 37, p= .000) were positively and significantly correlated with depressive symptomatology (Table 1). Thus, high values of social anxiety WERE associated with higher levels of depressive symptomatology. The association between social anxiety and depressive symptomatology was of moderate magnitude, while the association between humiliation/rejection and public performance anxiety was low.

Regarding parenting styles, it was found that none of them obtained associations that were significant, either with social anxiety, and their dimensions, or with depressive symptoms.

Table 1. *Pearson correlations (r) between depressive symptomatology, social anxiety and parenting styles. (N= 121)*

Variable	1.	2.	3.	4.	5.	6.
1. Depressive Symptomology (CDI)	1					
2. Social Anxiety (MASQ)	.40**	1				
3. Humiliation/Rejection (MASQ)	.34**	.92**	1			
4. Public Performance Anxiety (MASQ)	.37**	.82**	.52**	1		
5. Disapproving Style(PSST)	.12	.07	.03	.11	1	
6. Explorer Style(PSST)	-.03	-.04	-.05	-.02	.07	1
7. Accepting Style (PSST)	.10	.02	.03	-.01	.14	.17

** p≤.01; CDI = *Children's Depression Inventory*; MASQ = *Multidimensional Anxiety Scale for Children*; MASQ = *Multidimensional Anxiety Scale for Children*; PSST = *Parenting Scale Self-Test*.

We also analyzed the associations between the variables under study only for the group of mothers, due to the great disparity in the number of mothers and fathers that constitute the sample. It was possible to verify that all correlations of social anxiety and its dimensions with depressive symptomatology were very similar to those obtained in the sample that included mothers and fathers.

3.3 Study of the predictive effects of social anxiety and parenting styles on depressive symptomatology

The results of the multiple regression analyzes showed that humiliation/rejection anxiety and public performance anxiety produced a significant model (R2= .166; F(2, 119)= 11.871, p= .000), which accounts for 16.6% of the variance in depressive symptomatology. Public performance anxiety appeared as the best predictor of depressive symptomatology (β= .264, p<.008), followed by humiliation/rejection anxiety (β= .203, p<.041). It should be noted that the effects were positive, so higher social anxiety was associated with higher levels of depressive symptomatology.

Regarding the analysis of parenting styles, it did not produce a significant model in the prediction of depressive symptomatology (R2= .024; F(3, 118)= .961, p=.414), explaining only 2.4% of the variance. It was found, therefore, that the disapproving (β= .112, p= .226), explorer (β= -.051, p= .581) and accepting (β= .090, p= .336) parenting styles of emotions did not emerge as predictors of depression.

The study of the predictive effects of the dimensions of social anxiety and parenting styles was also analyzed for the group of mothers. It was found that prediction models produced with humiliation/rejection anxiety and public performance anxiety remained significant and that models produced with parenting styles continued to not predict depressive symptomatology.

3.4 Analysis of the effects of moderation

Through multiple linear regressions it was found that, regarding the three parenting styles, the only significant moderating effect in the relationship between social anxiety and depressive symptomatology was the interaction between explorer parenting style and public performance anxiety.

3.5 Moderating effect of emotion explorer parenting style in the relation between social anxiety and depression

There was a moderating effect between public performance anxiety and explorer parenting style (β= .182, p=.044). However, when analyzing the variables by themselves, it was found that public performance was a predictor of depressive symptomatology (β= .369, p=.000), but explorer parenting style did not present this effect on depressive symptomatology (β= -021, p= .801) (see Table 2).

Table 2. *Regression coefficients of the three steps of the hierarchical multiple regression between support/depth, school performance and the interaction term (N= 121)*

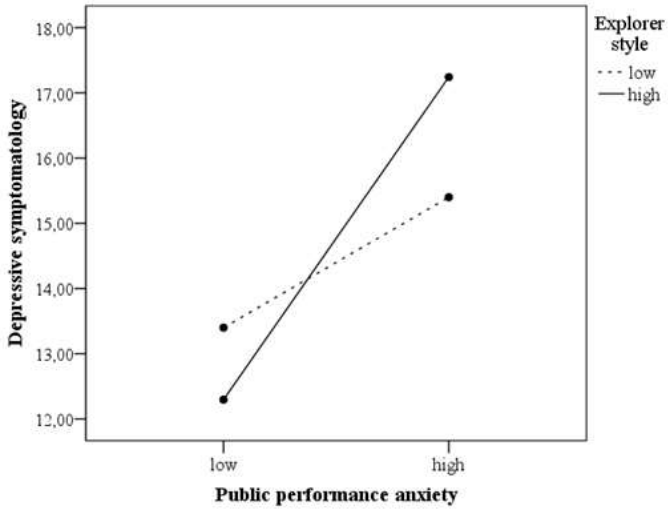
Model	Predictors	β	t	p
1	Public Performance	.369	4.353	.000
2	Public Performance	.369	4.330	.000
	Explorer Style	-.021	-.252	.801
3	Public Performance	.308	3.457	.001
	Explorer Style	-.009	-.103	.918
	Public Performance * Explorer Style	.182	2.040	.044

Public performance anxiety and explorer parenting style originated statistically significant models (see Table 3). When the interaction term was inserted in the third step, the model produced was also significant and there was an increase in the variability explained in relation to depressive symptomatology, which increased to 16.6%.

Table 3. *Model of the three steps of the hierarchical multiple regression for support/depth, school performance and the interaction term (N= 121)*

Model	R	R2	F	p
1	.369	.136	18.946	.000
2	.370	.137	9.431	.000
3	.408	.166	7.842	.000

The plot of the moderating effect obtained is shown below (Graph 1). Two levels (below and above average) were created for both the public performance anxiety variable and the explorer variable.
It is possible to observe that higher levels of public performance anxiety were related to higher depressive symptomatology when a higher explorer parenting style is present, compared to lower emotion explorer parenting style in the presence of a high level of anxiety of public performance (Graph 1).



Graph 1: *Moderating effect of explorer parenting style in the relationship between public performance and depressive symptomatology*

The analysis of this moderating effect was repeated for the group of mothers, however the interaction term was not significant.

4. DISCUSSION

The relationship between social anxiety and depression has been repeatedly demonstrated in the literature (Beert et al., 2007; Chavira et al., 2004; Essau et al., 1999; Wittchen et al., 1999). On the other hand, several studies (Katz & Windecker-Nelson, 2004; Katz et al., 2001; Gottman et al., 2006) have shown that parenting styles of emotional socialization influence the development of social skills and relate to less negative emotionality in children.

In the line with the reviewed literature, the present study found that social anxiety and its dimensions were significantly associated with depressive symptoms, suggesting that higher levels of social anxiety, public performance anxiety and humiliation/rejection are associated with higher levels of depressive symptomatology. The results obtained with the regression analysis corroborated that both dimensions of social anxiety present are significant predictors of depressive symptomatology, which is in agreement with other studies (Aune & Stiles, 2009; Beesdo et al., 2007; Chavira et al., Dalrymple & Zimmerman, 2011, Stein et al., 2001). The anxiety symptomatology seems to make adolescents more vulnerable to development of depression later on and in higher levels, perhaps due to the impairment caused in their functioning, namely in school and peers context, and due to the use of maladaptive strategies of emotional regulation (Drost et al., 2014; Grant et al., 2014; Rao et al., 2007).

In the regression analysis, it was not found that none of the parenting styles was a predictor of depressive symptomatology, either for the total sample or when only the sample of mothers was considered. This result was not expected, considering previous investigations (Buckholdt et al., 2014b; Hunter et al., 2010; Katz & Hunter, 2007; Stocker et al., 2007; Yap et al., 2010) which showed that invalidation or reprimand of negative emotional expression is related to an increase in internalizing symptomatology (namely, depression) and the possible negative consequences of this type of parenting style (e.g., children learn that their emotions are inappropriate and invalid, believing that something is wrong with them because of the way they feel).

The only moderation that was found to be significant in the overall sample concerns the effect of explorer parenting style in the relationship between public performance anxiety and depressive symptomatology of the adolescent. Thus, the relationship between public performance anxiety and depressive symptomatology varies depending on whether parents are more or less

emotion explorers. It was found that when adolescents present high levels of public performance anxiety, having parents with an explorer style predicts more depressive symptomatology. Explorer parents seem to not assume a protective nature against depressive symptomatology when social anxiety (public performance) is high. This result was not expected, since the explorer parenting style is conceptualized as being adaptive. Nevertheless, these parents do not seem to adopt behaviors that teach strategies of emotional regulation in order to facilitate the experience of negative emotionality, exploring only what caused that experience. Since emotional regulation skills are known to mediate the relationship between these disorders, having parents who simply explore their children's emotions seems to affect the expression of depressive symptoms, perhaps because children talk about their difficulties and feelings, but parents don't show them how to deal with their emotions. Having a high level of performance anxiety, children may not be able to regulate what they are feeling, triggering negative emotionality in general and depressive symptomatology in particular.

However, it is noteworthy that when we repeated the moderation study for the group of mothers, excluding fathers from the sample, this interaction effect between public performance anxiety and explorer parenting style was not significant. It may be hypothesized that the moderation of the explorer parenting style in the relationship between public performance anxiety and depressive symptomatology in adolescents may be influenced by the gender of the parents, probably with a greater influence from male parents.

It should be noted that the results in the present study may be influenced by the fact that the sample is mostly composed by explorer parents, not being clear about the effect that other parenting styles, namely the disapproving one, may have on the relationship between social anxiety and depression. In addition, having a community sample whose average depressive symptomatology is below the threshold for diagnosis of depression may also have contributed to the reduced effect of parenting styles on depressive symptomatology. Studies with clinical samples have demonstrated the importance of parenting styles for the vulnerability of adolescents to depressive symptomatology (Hunter et al., 2010; Katz & Hunter, 2007).

This study, in accordance to previous investigations, showed the relationship between social anxiety and depression, and also produced information about the interference that parenting styles have or do not have in that relationship. Thus, this research contributes to the clarification of the role of parenting styles in the psychological functioning of the children and allows to point future directions of investigation, taking into account not only the different variables that may influence the development of depression in adolescence, but also the study of these variables in the interactions that are differentially established with the father and mother. According to the results of this study, the predictive effect of social anxiety and the effect of interaction between public performance anxiety and the explorer parenting style should be considered in the development of programs for prevention and treatment of depressive symptomatology in adolescents.

CONCLUSIONS

In this study, the relationship between social anxiety and depressive symptomatology, the relationship between parenting styles and anxious and depressive symptomatology in adolescents, as well as the moderating effect of parenting styles on the relationship between social anxiety and depression were analyzed.

It was found that social anxiety is significantly associated to depression and that the former has a predictive effect on the latter Social anxiety may precede the onset of depressive symptomatology and contribute to its worse prognosis. The parenting styles revealed no significant associations with either depressive symptomatology or with social anxiety, but a moderating effect of the explorer style was found, in the relationship between social anxiety (public performance) and depressive symptomatology. It was found that explorer style is not protective of depressive symptomatology when public performance is high. On the contrary it may even be harmful, aggravating the expression of depressive symptoms.

In the present study, the sample consists mainly of female subjects, both for the children and for the parents. In fact, the small number of male parents made it impossible to study this group separately. It is important that future studies analyze the relationship between the variables studied in this research for the fathers and compare the results obtained with those of the mothers'. Social desirability, which was not a controlled variable, may have influenced the responses obtained in self-response instruments. Considering these two aspects, it would be relevant to develop studies with more gender-balanced samples, in which the variable of social desirability is controlled. Likewise, a clinical sample could be used in order to understand if, in a sample of children with psychopathology, the influence of parenting styles shown is more expressive. Thus it would also be possible to assess whether the explorer parenting style remains as predominant or if other parenting style could be more relevant, namely parenting styles that criticize and suppress the negative emotional experience of the children, since they have been frequently associated to the development of internalizing symptomatology (Buckholdt et al., 2014b; Hunter et al., 2010;

Katz & Hunter, 2007; Stocker et al., 2007; Yap et al., 2010). With this being a cross-sectional study it would be equally important to develop longitudinal studies in a Portuguese sample, so as to draw a conclusion regarding the directionality of the relationship between social anxiety and depression.

Based on the literature review, it is clear that parenting styles used to deal with emotions contribute to the development of children's emotional regulation skills and that these, in turn, have an impact on their adjustment and psychosocial functioning.

Therefore it is stated, as an additional hypothesis, that the influence of parenting styles is expressed in the symptoms of social anxiety and depression through the emotional regulation strategies learned in the relationship with the parents, thus, this mediating effect should be investigated in future studies.

CONFLICT OF INTERESTS

The authors have no conflicts of interest.

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IMPACTO DO ESTILO DE VIDA DO IDOSO NA CONCENTRAÇÃO PLASMÁTICA DE VITAMINA D E PTH

LIFESTYLE IMPACT ON SERUM LEVEL OF VITAMIN D AND PTH, IN ELDERLY

IMPACTO DEL ESTILO DE VIDA DEL IDOSO NA CONCENTRACIÓN PLASMÁTICA DE VITAMINA D E PTH

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RESUMO

Introdução: O processo de envelhecimento é responsável pelo declínio progressivo da saúde geral do idoso que, poderá culminar na dependência e consequente institucionalização. A PTH e a vitamina D são as principais hormonas responsáveis pela regulação da fisiologia óssea.

Objetivos: O presente estudo objetiva avaliar as hormonas envolvidas na regulação do cálcio em idosos institucionalizados e, nos que habitam em zona rural, com estilo de vida independente e ativo.

Métodos: Neste estudo foram avaliados 50 idosos (25 institucionalizados e 25 não institucionalizados) sujeitos a um inquérito, aos quais foram determinados os níveis plasmáticos de 25(OH)D e de iPTH.

Resultados: O grupo de idosos não institucionalizados apresentou valores para a 25(OH)D mais elevados, comparativamente ao grupo institucionalizado (p-value<0.05). Observou-se uma correlação negativa entre 25(OH)D e iPTH. Os indivíduos que tomavam suplementos vitamínicos de cálcio e/ou medicação indicada para o metabolismo do cálcio, apresentaram valores mais elevados de 25(OH)D (p-value<0.05) e mais baixos de iPTH (p-value<0.05). Os idosos não institucionalizados e que simultaneamente praticavam 3 ou mais atividades diárias, apresentaram valores mais elevados de 25(OH)D (p-value<0.05) e consequentemente concentrações mais baixas de iPTH (p-value<0.05), comparativamente aos institucionalizados.

Conclusões: A adoção de um estilo de vida ativo e o contacto com a natureza traz benefícios ao envelhecimento em qualidade.

Palavras-chave: Institucionalização; 25-hidroxivitamina D_3; 1,25-dihidroxivitamina D_3; Paratormona)

ABSTRACT

Introduction: The aging process is responsible for health decline and may lead to the dependence and consequent institutionalization. Bone metabolism involves serum calcium regulators, such as vitamin D and PTH.

Objetives: The following study evaluated and compared serum concentrations of 25(OH)D and iPTH in elderly people living in institutions and living in their homes (free-living), with active and independent life.

Methods: We evaluated 50 elderly (25 institutionalized and 25 not institutionalized). We made an individual questionnaire and we collected blood to measured the serum concentrations of iPTH and 25(OH)D.

Results: Not institutionalized elderly showed higher 25(OH)D serum levels, comparing with institutionalized elderly (p-value<0,05). The serum concentration of 25(OH)D was inversely correlated with iPTH. Furthermore calcium supplementation correlated with higher serum levels of 25(OH)D (p-value<0.05) and lower concentrations of iPTH (p-value<0,05). The free-living elderly who practice three or more activities per day, had higher concentrations of 25(OH)D (p-value<0.05) and lower concentrations of iPTH (p-value<0.05), compared to the institutionalized elderly. Outdoor activities showed also correlation with serum concentrations of both hormones (p-value<0.05).

Conclusion: The adoption of an active lifestyle and the contact with nature, carry profit to a better aging process.

Keywords: Institutionalization; 25-hydroxivitamin D_3; 1,25-dihydroxyvitamin D_3; Parathormone)

RESUMEN

Introducción: El proceso de envejecimiento es responsable de la disminución gradual de la salud general de las personas mayores que pueden conducir a la dependencia y la consecuente institucionalización. PTH y vitamina D son las principales hormonas responsables de la regulación de la fisiología ósea.

Objetivos: Este estudio tiene como objetivo evaluar la hormona implicada en la regulación del calcio en ancianos institucionalizados y, e los que viven en zonas rurales, con el estilo de vida independiente y activa. **Métodos:** Este estudio evaluó 50 ancianos (25 institucionalizada y 25 no institucionalizada) objeto de una investigación, que se determinaron los niveles plasmáticos de 25 (OH) D y PTH.

Resultados: El grupo de ancianos no institucionalizados mostraron valores de 25 (OH) D mayor en comparación con el grupo institucionalizado (valor de p <0.05). Hubo una correlación negativa entre la 25 (OH) D y PTH. Las personas que tomaron suplementos vitamínicos de calcio y / o medicamentos indicados para el metabolismo del calcio, tenían mayores niveles de 25 (OH) D (valor de p <0,05) y menor PTHi (valor de p <0.05). La ancianos no institucionalizados y al mismo tiempo practicaron 3 o más actividades diarias mostraron mayores niveles de 25 (OH) D (valor de p <0.05) y en consecuencia menores concentraciones de PTH (valor de p <0.05) en comparación con institucionalizada.

Conclusións: La adopción de un estilo de vida activo y el contacto con la naturaleza trae beneficios al envejecimiento de calidad.

Palabras clave: Institucionalización; 25-dihidroxivitamina D_3; 1,25-hidroxivitamina D_3; la hormona paratiroidea

INTRODUCTION

Over the last decades we have been witnessing the aging process of the population. In Portugal, as it stands all over the world, between the years of 2009 and 2014 there was a decrease of the young population and of the population in active age with an increase of the elderly. This is a result of many factors like the low birth rate, the increase of longevity and immigration (Instituto Nacional Estatistica, 2014).

The aging process conducts to physical and sensory limitations that make daily activities more difficult and conduct to dependency. Besides, the elderly suffers a progressive decline of their physical and mental health, witch creates a need for more support (Marisa & Neves, 2012). In 2014, in Portugal, the dependency index was 31 elderlies for each 100 people in active age (Instituto Nacional Estatistica , 2014).

It has been found, in the developing countries, a lot of changes on the families' role regarding the care provided to the elderly. Factors like urbanization, young migration to other cities, smaller families mean, in practice, less people available to take care of the elderly (World Health Organization, 2005). The necessity of being helped (mentally, affectively and physically) causes the elderly to live institutionalized (Castro, Camargos, Rodrigues, & Machado, 2011; Marisa & Neves, 2012; Paula, Sequeira, & Dias, 2011).

The institutionalized elderly are different from the one that is not, specially in a daily routine perspective and lifestyle. The first depends on what the people that takes care of him decides, the second only depends on himself and can change his daily program whenever he wants. Is increasingly consensual the necessity to keep people active in their environments keeping in mind the physical, social and mental equilibrium. In this way, we can even question if being institutionalized provides this necessary and healthy equilibrium between the biological conditions and his environment (Paula et al., 2011; World Health Organization, 2005). Several studies point to the idea that institutionalization creates physical inactivity and social exclusion, as well as the communication between the elderly, the exterior world and the environment. Institutionalized elderly usually find themselves restricted to the institutionalized space and the tasks that the people taking care of them make them do. This limitations origin the decline of the autonomy capacity which culminates in the increase of the dependency(Marisa & Neves, 2012; Paula et al., 2011). On the other hand, this elderly benefit of a daily support and care according to their necessities (Paula et al., 2011). The non-institutionalized-elderly lives in his comfort zone and plans his activities. He depends only on his family, friends and community to take care of his needs (Marisa & Neves, 2012; Paula et al., 2011).

With the aging process, the osseous metabolism suffers some alterations like the reduction of the mass bone and a higher risk of fracture. The mass bone is maintained through the continuous balance between the formation and destruction. The osseous metabolism, it involves the availability of several minerals (calcium and phosphide) and a series of hormones that regulate the plasmatic concentration of calcium. The parathormone (PTH) and vitamin D are the manly responsible hormones osseous physiologic regulation (Boucher, 2012; Lips, 2012; Thacher & Clarke, 2011).

Vitamin D (Calciferol) includes two steroids forms, the D_2 and D_3, both of them obtained the diet and cutaneous synthesis potentiated by the presence of UV radiation. Vitamin D plays an hormonal role and is produced from 7-dehydrocholesterol, a cholesterol precursor found in the high skin concentrations. UV radiation potentiates the formation of vitamin D_3 witch activation has two hydroxylation: In the liver is hydroxylated to 25-hydroxivitamin D_3 (25(OH)D), compound that is transported to the kidney in order to suffer a new hydroxylation and create the 1,25-dihydroxyvitamin D_3 ($1,25(OH)_2D_3$) (The most active form of vitamin D). The $1,25(OH)_2D_3$ (calcitriol) acts in the intestine to absorbed the calcium (7,8). The deficiency of vitamin D results in a decrease of the bone mineralization and in a rickets in the child and osteomalacia in the adult (Laird, Ward, McSorley, Strain, & Wallace, 2010). The hypovitaminosis D is a lack of vitamin increasingly frequent in the developed countries due to dietary errors lower sun exposure and sedentary lifestyle (Silva, Camargos, Fujii, Dias, & Soares, 2008; Thacher & Clarke, 2011). Beyond these aspects, several studies point to hypovitaminosis D even in countries with a lot of sun radiation and in studies made at the final of the summer (Lanham-new, 2008; Pérez-llamas et al., 2008; Portela et al., 2010). The plasmatic concentration of vitamin D, is interpreted according to reference values assumed for the adults, being that, plasmatic concentrations that are inferior to 20 ng/ml determine state of deficiency of the hormone; values between 20 ng/ml and 30 ng/ml, are considered insufficient; and concentrations between 30 and 100 ng/ml are sufficient when it comes to an adult (Analytics, Ce, & La, 2010). In fact, the geriatric population is more sensitive to hypovitaminosis D due to several reasons: low sun exposure, reduction of the capacity to synthesise the hypovitaminosis D, bad diet, inadequate absorption of calcium by the gastrointestinal tract, utilization of medication and the compromise of the kidneys (Santiago et al., 2012; Saraiva et al., 2007; Timpini, Pini, Tantucci, Cossi, & Grassi, 2011). Several studies point to a plus risk of hypovitaminosis D on patients that are institutionalized or hospitalized (Ebeling, 2014; Gallagher et al., 1998; Himeno et al., 2009; Kinyamu, Gallagher, Balhorn, Petranick, & Rafferty, 1997; Kinyamu, Gallagher, Rafferty, & Balhorn, 1998; Kuwabara et al., 2009; Marta & Cardoso, n.d.; Suleiman, Nelson, Li, & Moniz, 1997). The synthesis of $1,25(OH)_2D_3$ is potentiated by the PTH and inhibited by high serum levels of calcium.

The hormone of the parathyroid, PTH, is produced by the parathyroid glands. The secretion of this hormone is regulated by the plasmatic calcium concentration, in an inverse relation between the ion concentration and the hormone liberation (Ebeling, 2014).

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The connection of PTH to the receptors of the parathyroid hormone on the target tissues, begins a sequence of reactions that result in the increase of extracellular calcium. The PTH stimulates the bone reabsorption, resulting in the release of bone's calcium, as well as the reabsorption of calcium in the renal tubules and, synthesis of 1,25-dihydroxyvitamin D, that acts over the intestinal cells to increase the calcium reabsorption (Saraiva et al., 2007; Thacher & Clarke, 2011). The peptide of PTH intact (iPTH) is composed by 84 amino acids and suffers modifications in the liver, capable of produce fragments of PTH. The reference range for the iPTH was established through the dosing in samples in healthy individuals, setting up a global range of 14 to 72 pg/ml (Pth, 2007).
This study has the purpose of evaluate the hormones that are involved in the regulation of calcium in institutionalized and non-institutionalized elderly, with an independent and active lifestyle.

1. METHODS

This investigation was made having in mind an observational and analytic study.

1.1 Sample

The first group was composed by 25 institutionalized elderly, with ages between 63 and 98 (19 were female and 6 were male) not completely immobilized that were living in three different nursing homes. The second group was composed by 25 non-institutionalized elderly, with ages between 63 and 91 (15 were female and 10 were male) with an independent and active life. After we made a questionnaire, we collected blood samples in to EDTA tube. We collected the blood samples during November.

1.2 Data collection instruments and procedures

For the present study were selected two sample groups. In order to do that we used the sampling technique for convenience of the non-probabilistic type. In an initial fase, the participants were evaluated through a questionnaire about life style, autonomy and health state. The autonomy and mobility level was evaluated using the Barthel Index. This index allows the mediation of the dependency level through the sum of points obtained on each scale parameter. The punctuation obtained allows us to frame the respondent in a specific class of dependency: Totally dependent (<20points) Severely dependent (20-39 points) moderately dependent (40-59 points) lightly dependent (60-89) and independent (90-100 points).
After the realization of the questionnaires, the process of collecting blood samples was fulfilled using EDTA test tubes, posteriorly stored in ice until the moment of analytic dosing.
For the measurement of the vitamin D, we used the assay ADVIA Centaur Vitamin D Total, Siemens- Germany, that realizes the quantitative determination of the total 25(OH)vitamin D in the serum and human plasma. It is a competitive immunoassay, that uses an antibody anti-fluorescein monoclonal connected by covalent to paramagnetic particles, an antibody anti-25(OH)vitamin D monoclonal marked by an acridine ester and a vitamin analog marked with fluorescein. The quantity of vitamin D present in the sample will be inversely proportional to the amount of relative light units (RLUs) detected by the system. This assay has, as detention limits, concentrations of 25 (OH)D of 4,2 ng/ml and 150 ng/ml (Analytics et al., 2010)
For the plasmatic determination of iPTH (Intact parathyroid hormone) we used the assay ADVIA Centaur PTH intact, Siemens-Germany. It is a sandwich type immunoassay, that uses direct quimioluminometric technology, and utilizes constant quantities of two antibodies anti-PTH human. The first antibody is a polyclonal anti-PTH human of goat marked by acridine ester. The second is a polyclonal antibody ant PTH human of goat biotinylated. The solid faze contains streptavidin, a substance that allows the connection of the biotinylated antibody. The quantity of IPTH present in the sample is directly proportional to the quantity of relative units of light (RLUs) detected by de system. For this assay, the limits of detection are 2,5 pg/ml and 1900 pg/ml (Pth, 2007).

1.3 Statiscal analysis

The statistical treatment of the collected data by questionnaires and blood samples, had as support the IBM SPSS 21 Software. The statistical designs applied were: Wilcoxon-Mann-Whitney, linear correlation coefficient Pearson and Spearman Correlation of Ordinal. For the statistical inference was assumed a degree of confidence of 95%, for a random error probability less or equal to 5%

2. RESULTS

According to the collected data from the surveys and the obtained results on the 25(OH)D and iPTH dosing, we obtained the results that we are going to introduce and describe in a short way on the tables 1 and 2.

Table 1: Relationship between 25(OH)D / iPTH results, and all variables studied.

		25(OH)D (ng/ml)		iPTH (pg/ml)	
		M±SD (n)	*p*	M±SD (n)	*p*
Institutionalization	Yes	5.72±3.75 (25)	0.021	93.57±38.69 (23)	0.076
	No	7.19±3.88 (25)		74.08±30.23 (21)	
Gender	Female	6.87±4.17 (34)	0.404	82.87±38.20 (30)	0.392
	Male	5.57±2.99 (16)		87.26±31.49 (14)	
Chronic Disease					
Kidney	Yes	6.19±3.51 (11)	0.629	70.76±26.93 (10)	0.198
	No	6.53±3.98 (39)		88.24±37.54 (34)	
Bone	Yes	7.75±4.24 (4)	0.202	58.20±30.35 (3)	0.185
	No	6.35±3.84 (46)		86.18±35.83 (41)	
Skin	Yes	6.66±2.29 (3)	0.539	69.63±31.77 (3)	0.500
	No	6.44±3.94 (47)		85.34±36.29 (41)	
Thyroid	Yes	8.27±2.95 (3)	0.059	64.80±23.83 (3)	0.295
	No	6.34±3.89 (47)		85.70±36.41 (41)	
Other	Yes	6.15±3.20 (20)	0.265	82.76±33.08 (17)	0.277
	No	6.67±4.26 (30)		85.22±38.14 (27)	
Vitamin Supplements					
Calcium Metabolism	Yes	8.41±5.10 (7)	0.030	63.44±32.08 (7)	0.052
	No	6.14±3.58 (43)		88.21±35.59 (37)	
Others	Yes	6.47±3.20 (2)	0,869	70.80±29.42 (2)	0.612
	No	6.46±3.90 (48)		84.91±36.34 (42)	
Daily Activities					
Walking	Yes	6.68±3.79 (28)	0.459	72.21±26.98 (25)	0.016
	No	6.18±3.99 (22)		100.14±40.48 (19)	
Agriculture	Yes	7.33±4.03 (21)	0.033	71.42±28.56 (17)	0.073
	No	5.82±3.65 (29)		92.36±38.11 (27)	
Housework	Yes	7.53±4.24 (18)	0.110	64.08±23.28 (16)	0.003
	No	5.86±3.53 (32)		95.81±37.02 (28)	
Number of daily activities	[1-2]	6.23±3.92 (25)	0.456	96.21±39.77 (22)	0.041
	≥3	6.69±3.84 (25)		72.33±27.52 (22)	
Food					
Number of daily meals	[3-4]	6.28±3.53 (37)	0.721	85.47±36.23 (32)	0.527
	[5-6]	6.91±4.76 (13)		81.07±36.35 (12)	
Barthel Index					
Slightly dependent		4.29±0.21 (7)	0.124	120.53±56.61 (6)	0.075
Independent		6.81±4.04 (43)		78.54±28.58 (38)	

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Table 2: Relationship between 25(OH)D / iPTH results, and all variables studied according the variable "institutionalization".

		Institutionalization				
25(OH)D (ng/ml)		Yes		No		
		M±SD (n)	*p*	M±SD (n)	*p*	*p*
Vitamin Supplements						
Calcium Metabolism	Yes	4.72±0.00 (1)	0.139	9.02±5.29 (6)	0.224	0.617
	No	5.76±3.82 (24)		6.62±3.29 (19)		0.068
Others	Yes	4.20±0.00 (1)	0.579	8.73±0.00 (1)	0.474	0.317
	No	5.79±3.81 (24)		7.13±3.95 (24)		0.036
Daily Activities						
Number of daily activities	[1-2]	6.01±4.04 (21)	0.235	7.35±3.51 (4)	0.619	0.131
	≥3	4.20±0.00 (4)		7.16±4.03 (21)		0.055
Food						
Number of daily meals	[3-4]	5.90±3.97 (22)	0.823	6.87±2.82 (15)	0.753	0.030
	[5-6]	4.37±0.30 (3)		7.67±5.23 (10)		0.358
Barthel Index						
Slightly dependent		4.29±0.21 (7)	0.511	-(*)	-(*)	-(*)
Independent		6.29±4.31 (18)		7.19±3.88 (25)		0.103
iPTH (pg/ml)						
Vitamin Supplements						
Calcium metabolism	Yes	50.70±0.00 (1)	0.175	65.57±34.60 (6)	0.276	1.00
	No	95.52±38.39 (22)		77.49±28.88 (15)		0.146
Others	Yes	50.00±0.00 (1)	0.132	91.60±0.00 (1)	0.322	0.317
	No	95.55±38.39 (22)		73.21±30.74 (20)		0.047
Daily Activities						
Number of daily activities	[1-2]	92.79±41.05 (19)	0.685	117.87±24.97 (3)	0.021	0.131
	≥3	97.30±29.07 (4)		66.78±24.64 (18)		0.042
Food						
Number of daily meals	[3-4]	91.92±35.39 (20)	1.00	74.73±36.53 (12)	0.776	0.186
	[5-6]	104.60±66.06 (3)		73.22±21.17 (9)		0.782
Barthel Index						
Slightly dependent		120.53±56.61 (6)	0.208	-(*)	-(*)	-(*)
Independent		84.06±26.24 (17)		74.08±30.23 (21)		0.223

Legend: M: Average. SD: Standard Deviation. N: number of valid cases. p: p-value. Wilcoxon Mann-Whitney test for independent samples and Correlations of Pearson and Spearman.

(*) For this condition, there are zero cases

3. DISCUSSION

An introspective analysis to the results exposed showed, in first hand, a severe deficiency of vitamin D in both groups of study. In average, the concentration of 25(OH)D was 5,72 ng/ml±3,75 for the institutionalized group, and 7,19 ng/ml±3,88 for the non-institutionalized group. Attending to these results, we can deduce that in both groups, the average was substantially lower to the values considered sufficient of vitamin D for adults, because values lower than 20 ng/ml translate deficiency of this hormone. In a study realized by M. L. Pita Martin Portela et al. 2010, witch aimed to dose the 25(OH)D in institutionalized elderly of two countries with similar solar radiation index, they verified that, even in the end of the summer there were a deficit of vitamin D in both groups. This study seems to indicate that the deficiency of vitamin D is not restrict to a specific season, but transversal to all year, despite the fact that the values of vitamin D tend to be higher during the months of summer (Portela et al., 2010).

The synthesis mechanism of vitamin D tends to suffer alterations with the aging process, not only because of the lower sun exposure, but also due to the compromised capacity to create precursors of vitamin D in the skin, the reduce intake of vitamin D in the diet and, possibly, also because of the decay of the receptors of vitamin D in the duodenum. Besides, the capacity to convert the vitamin D in its active molecule ($1,25(OH)_2D$) suffers a decline, because of the renal commitment, natural in this age group. Citing a study by Saraiva et al 2007, that evaluated the prevalence of deficiency/failure of vitamin D in non-institutionalized and institutionalized elderly, 71,2% of the institutionalized individuals and 43,8% of the non-institutionalized had values of 25(OH)D lower than the recommended minimum, being that, in both groups, the woman had values of 25(OH)D lower than the men ($p<0,001$) (Santiago et al., 2012). A study realized by Gallagher et al, 1998, refers precisely differences of 2 to 3 ng/ml of 25(OH)D, between genders, (Gallagher et al., 1998) although our study didn't prove that.

In fact, the deficiency of vitamin D looks common among elderly, being that the institutionalized tend to present a sharpest deficit of vitamin D comparatively to the non-institutionalized (Kinyamu et al., 1997). The study realized by Saraiva et al 2007, found that the non-institutionalized group presented, in average, serum concentration of 25(OH)D higher comparatively to the institutionalized group (Saraiva et al., 2007).

On the other hand, for the iPTH the results were considerably high. The average values of iPTH were between 93,57 pg/ml±38,69 for the institutionalized group and 74,08 pg/ml±30,23 for the non-institutionalized individuals. Attending to this data we verified that, for the PTH hormone, there is no deficit but higher concentrations to the reference range (14-72 pg/ml). Several studies point for an increase of the plasmatic concentration of iPTH with the aging process. Gallagher et al 1998, gives focus to this increase and points, as a possible explanation, the decrease of the renal function (Gallagher et al., 1998). However, such increase is not explained only by the decrease of renal clearance, but can represent secondary hyperparathyroidism being that a result of vitamin D failure (Saraiva et al., 2007).

Beyond this aspect, it becomes important to emphasize, that in the group samples, we verified an inverse relation between the 25(OH)D and iPTH ($r= - 0,160$). So, the institutionalized group presented lower concentrations of 25(OH)D and higher concentrations of iPTH, while the non-institutionalized revealed higher concentrations of 25(OH)D and lower concentrations of iPTH. Several studies, performed on elderly, support the inverse relation between 25(OH)D and PTH (Portela et al., 2010; Saraiva et al., 2007; Silva et al., 2008). This results reflect the attempt to compensate the insufficiency of vitamin D, through the PTH. Lower concentrations of $1,25(OH)_2$ D, culminate with the decrease of calcium intestinal absorption and consequently, with the decrease of serum calcium, witch in turn, triggers the increase of PTH secretion by the parathyroid. In our study, the presence of thyroid disease, didn't show any kind of relation with the concentration of 25(OH)D, however, it seems to exist a correspondence between these two variables ($p=0,059$). In fact, an accentuated deficit of vitamin D triggers an increase of the PTH secretion. When the deficit is long, the probability of developing secondary hyperparathyroidism is high.

Attending to the vitamin supplementation, we verified that the elderly that took calcium supplements and/or indicated medication for the calcium metabolism, presented higher values of 25(OH)D ($p<0,05$) and lower concentrations of iPTH ($p=0,052$). Several studies have been developed, with the objective of understanding the pros and cons of this type of medication. According to Kuwabara et al 2009, the daily vitamin D supplementation in institutionalized individuals is crucial, having in mind that the sun exposure among these elderly is reduced (Kuwabara et al., 2009). Curiously, in our study, we verified that the non-institutionalized elderly that don't take any type of vitamin supplementation, present higher values of 25(OH)D ($p<0,05$) and lower concentrations of iPTH ($p<0,05$) comparatively to the institutionalized. Attending to these results, we can verify that the adoption of an active life style, independent and the life in the countryside seems to contribute for more balanced plasmatic concentrations of these hormones. Even so, the hypovitaminosis D is evident and should not be underrated. These data allow us to reflect about the necessity of vitamin supplementation for the calcium metabolism, even in elderly that live in the countryside and have an active life. According to the National Academy of Science, it is important to use an daily unique multivitamin that contains 400-800UI/d of ergocalciferol (10-20 µg/dia), that will provide the normal level of vitamin D,

even in institutionalized elderly (Marta & Cardoso, n.d.) The daily activities practiced by the elderly, showed to be related with the hormones that are being studied. We verified that the individuals that performed more daily activities tended to present lower concentrations of iPTH ($p<0,05$). Analyzing the results, the practice of outdoor activities seems to be related with the concentrations of 25 (OH)D and consequently iPTH, as agricultural activities and walks. The lower sun exposure is associated to a decrease of mobility and to a lower activity. Several studies point, as manly cause of the decrease of vitamin D plasmatic concentration with the aging process, the lower sun exposure (Gallagher et al., 1998). In fact, the practice of outdoor activities allows the increase of sun exposure and, consequently, an increase of cutaneous synthesis of vitamin D, needed for the calcium intestinal absorption. The consequent increase of the calcium serum levels triggers the decrease PTH synthesis. This could be the explanation for active individuals to present better results for the hormones that regulate calcium. Apart from this aspect, the practice of daily activities has been associated with an improvement of the bone density and consequently the prevention of osteoporosis. It is known that factors like the prevention of the need of vitamin D and the practice of physical exercise contributes for the bone reshuffle. However, the relation between a sedentary lifestyle and the plasmatic concentrations of the hormones that regulate calcium is not evident (Marta & Cardoso, n.d.). A study performed by Suleiman et al, 1997, that aimed to evaluate the influence of the ingestion of calcium and the physical activity in the osseous turnover in postmenopausal woman, concludes that the practice of physical activity allied to an ingestion of calcium in the diet, favored the increase of the bone mineral density ($p<0.001$) (Suleiman et al., 1997).

The elderly that realized three to four meals per day, and that were not institutionalized, tended to present better results for the vitamin D. There weren't found studies that support the relation between the number of daily meals and the concentrations of 25(OH)D and iPTH. However, the diet and, particularly, the daily ingestion of calcium and vitamin D in the diet are indispensable for the bone metabolism. Kinyamu et al, 1998 investigated in what way the calcium ingestion through dairy, could reflect the decrease of iPTH. It concludes that, in fact, the ingestion of foods rich in calcium contributed for the decrease of iPTH and prevention of secondary Hyperparathyroidism (Kinyamu et al., 1998).

CONCLUSIONS

The present study corroborates the premise that the adoption of an active life style and the contact with nature brings benefits to the aging process. It was found an elevated prevalence of hypovitaminosis on the elderly that made part of this study and particularly the institutionalized. The concentrations of 25(OH)D were substantially higher on the countryside elderly with an active and independent life. This result might be explained through the higher sun exposure of these elderly, comparatively to the institutionalized ones, whose tasks are, usually restricted to the institutional space. The PTH represented an inverse relation with the 25(OH)D expected, this is, the group with lower concentrations of 25(OH)D, presented higher concentrations of iPTH. This is a physiological behavior and intends to compensate the hypovitaminosis D, however it can be explained as well with the secondary hyperparathyroidism. It would be important to discard this condition in future studies through the ionized calcium mediation in order to, in case of hypercalcemia, we can contribute for its clarification. The PTH serum level will be higher if it is a result of some kind of hyperparathyroidism; if the hypercalcemia has a non-parathyroid origin, than the PTH will deleted. It would be advantageous to exclude the interference of the renal and liver function in these hormones concentrations, through de measurement of the serum creatinine and transaminases, respectively, excluding all the elderly that presented all these changed parameters. Beyond this conditions, it would be interesting to associate these results to the bone mechanisms, through the mediation of the bone mineral density and markers of bone reshuffle, associating them to the risk of fracture and falls prevention.

Concluding, we observe a higher prevalence of hypovitaminosis D in geriatric population, that were more sharp in the institutionalized group, but also present in the non-institutionalized group. Because of this, we consider that the incentive for sun exposure, vitamin supplementation for the calcium metabolism, food fortification and the practice of daily activities, should be taken into account, in our country as well as the implementation of food fortification politics with vitamin D, specially directed to the ones with higher risk.

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QUALIDADE DE VIDA EM IDOSOS INSTITUCIONALIZADOS SUBMETIDOS A UM PROGRAMA DE ENVELHECIMENTO ATIVO

QUALITY OF LIFE IN INSTITUTIONALIZED ELDERLY UNDERGOING AN ACTIVE AGING PROGRAM

CALIDAD DE VIDA EN ANCIANOS INSTITUCIONALIZADOS SOMETIDOS A UN PROGRAMA DEL ENVEJECIMIENTO ACTIVO

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RESUMO

Introdução: Viver com qualidade é uma preocupação crescente no âmbito da população idosa. Assistimos a uma crescente institucionalização dos idosos e é neste contexto que os programas de envelhecimento ativo assumem relevância, possibilitando o contacto com experiências que lhes permitem envelhecer com qualidade de vida, mantendo a sua autonomia e fomentando o seu bem estar físico, psíquico e emocional.

Objetivo: Avaliar a qualidade de vida (QdV) dos idosos institucionalizados submetidos a um programa de envelhecimento ativo.

Métodos: Desenvolvemos um estudo do tipo quantitativo, quase-experimental, utilizando-se os seguintes instrumentos para a avaliação da QdV: EUROHIS-QOL-8 e WHOQOL-OLD, aos quais foram associadas questões sociodemográficas e clínicas. Foram efetuadas avaliações em dois momentos, pré e pós intervenção, numa amostra de 37 idosos institucionalizados.

Resultados: Relativamente à avaliação da QdV relacionada com a saúde (EUROHIS-QOL-8) encontramos pontuações superiores no segundo momento de avaliação com diferenças significativas (p=0.004). No que respeita à QdV relacionada com o idoso (WHOQOL-OLD) também se verificaram melhores pontuações no segundo momento de avaliação, com significância (p=0.001).

Conclusões: Os resultados evidenciam uma melhoria da perceção da QdV nos idosos submetidos a um programa de envelhecimento ativo, relevando a importância deste.

Palavras-chave: Qualidade de Vida; Envelhecimento; Institucionalização;

ABSTRACT

Introduction: Living with quality is a growing concern of the old population. There is an increasing institutionalization of the elderly, and it is in this context that active aging programs assume relevance, allowing the elderly the contact with experiences that allow them to age with quality of life, by maintaining their autonomy and promoting their physical, mental and emotional well-being.

Objective: To evaluate the quality of life (QOL) of institutionalized elderly undergoing to an active aging program.

Methods: We have developed a quantitative type study, semi-experimental, in which the following instruments were used to measure the quality of life: EUROHIS-QOL-8 and WHOQOL-OLD, to which sociodemographic and clinical questions were added. Assessments were made in two different moments, before and after the intervention program, in a sample of 37 institutionalized elderly.

Results: Concerning the assessment of quality of life related to health (EUROHIS-QOL-8), significant higher scores were obtained in the second moment (p=0.004). Regarding the quality of life (WHOQOL-OLD) related to the elderly significant better scores were also obtained in the second assessment (p=0.001).

Conclusions: The results show an improvement in the perception of quality of life in elderly patients undergoing to an active aging program, emphasizing the importance of it.

Keywords: Quality of life; Aging; Institutionalization;

RESUMEN

Introducción: Vivir con calidad es una preocupación creciente en la población anciana. Estamos asistiendo a una creciente institucionalización de los ancianos y es en este contexto que los programas de envejecimiento activo se volvieron más importantes, lo que permite el contacto con experiencias que les permitan envejecer con calidad de vida, manteniendo su autonomía y la promoción de su bienestar físico, mental y emocional.

Objetivo: Evaluar la calidad de vida de los pacientes ancianos institucionalizados sometidos a un programa de envejecimiento activo.

Métodos: Hemos desarrollado un estudio cuasi-experimental, utilizando las metodologías cuantitativas, utilizando los siguientes instrumentos para la evaluación de la calidad de vida: EUROHIS-QOL-8 y WHOQOL-OLD, que se asocia cuestiones sociodemográficas y clínicas. Las evaluaciones se realizaron en dos etapas, antes y después de la intervención en una muestra de 37 ancianos institucionalizados.

Resultados: Para la evaluación de la calidad de vida relacionada con la salud (EUROHIS-QOL-8) encontraron una puntuación más alta en la segunda evaluación con diferencias significativas (p = 0.004). En cuanto a la calidad de vida relacionada con la edad

avanzada (WHOQOL-OLD) también encontró altas puntuaciones en la segunda evaluación, con significación estadística (p = 0.001).
Conclusión: Los resultados muestran una mejora en la percepción de la calidad de vida en pacientes ancianos sometidos a programa de envejecimiento activo, haciendo hincapié en la importancia de esto.

Palabras clave: Calidad de Vida; Envejecimiento; Institucionalización;

INTRODUCTION

In Portugal, demographic ageing is a reality confirmed by the changes in the shape of population pyramids, with a narrowing of the pyramid's base (corresponding to the decrease in the number of younger people) and a widening of its top (corresponding to the increase in the number of older people). Between 2001 and 2011, the ageing index increased from 103 to 128 elders per 100 young people (Statistics Portugal (INE), 2013). According to INE (2015), the ageing index of the European Union (28 countries), in 2013, was of 119 elders per 100 youngsters, Germany presenting the highest rate (159) and Portugal coming in fifth place, with an index of 136. In 2014, Portugal's ageing index increased to 141 (INE, 2015).

Advancing age fosters the development of new pathologies and the decrease of physical, psychological and social capabilities, thus affecting QOL.

The concept of active ageing (AA) emerged in the late '90s, replacing the term healthy ageing. The World Health Organization - WHO (WHO, 2005, p.13) defines AA as "the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age." This concept applies to both individuals and population groups, allowing them not only to perceive their potential for physical, social and mental well-being throughout life, but also to engage actively in various affairs (Jacob, 2007). The nursing homes should provide activities of this nature, fostering social participation and promoting the self-esteem and well-being of its residents.

The main purpose of this study is to evaluate the QOL of institutionalised elders undergoing an active ageing programme at Santa Casa da Misericórdia, in Bragança.

1. THEORETICAL FRAMEWORK

WHO defines quality of life as the "individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHO, 1997, p. 1). According to Paschoal (2006), the concept of quality of life is subjective, wide, complex and ambiguous, bearing various meanings which differ from person to person and depend on time and place. Similarly, Fernández-Ballesteros, Kruse, Zamarrón, and Caprara (2009) talk about the multidimensionality of the concept, one of its most relevant aspects given its comprehension of various subjective conditions, behavioural and health aspects, as well as external and environmental circumstances.

Lawton (1983, *cited by* Paschoal, 2006) established a model of quality of life in old age divided into four interrelated sectors. The first sector refers to the environment. It should provide the appropriate conditions for human life, given that adaptive skills (such as emotions, cognition and behaviour) are influenced by physical and ecological contexts. The second sector is in reference to the behavioural competence, i.e., the individual's performance throughout life. This depends on each person's potential, on their life experiences, their values and their personal development, all this under the influence of the historical and cultural background. The third sector has to do with the perceived quality of life. The fourth sector, related to psychological well-being, indicates the satisfaction with one's own life, in an overall assessment or referring only to certain criteria.

Whoqol assessment instruments (WHOQOL-100 and WHOQOL-BREF) were created in the '90s by a group of international experts from 15 WHO research centres. Before these, there was no specific instrument with a conceptual base to assess QOL cross-cultural. Thus, a revision of the procedures was necessary to conclusively clarify the concept of quality of life, to which the notions of subjectivity and multidimensionality are related (Canavarro et al., 2010). Later on, shorter adaptations based on

WHOQOL-100 and WHOQOL-BREF were made to facilitate the participation and the filling of the questionnaires by the respondents. An example is EUROHIS-QOL-8.

Following the creation of WHOQOL-100 and WHOQOL-BREF as generic QOL measuring instruments created by the Whoqol Group, another project was developed: WHOQOL-OLD. Starting in 1999, the objective was to complement and specify the generic measuring instruments by adapting them for older adults (Vilar et al., 2010). The final version of WHOQOL-OLD comprises 24 items divided into six facets (sensory abilities; autonomy; past, present and future activities; social participation; death and dying; and intimacy). A new facet was added in the adaptation and validation of WHOQOL-OLD for the Portuguese population. Titled Family/Family Life, this new phase assessed the satisfaction with support from the families, the family relationship and the concern with the health and well-being of the family members (Vilar et al., 2013). Of the 8 initial items introduced in this facet, only four were considered, which resulted in a total of 28 items in the Portuguese version.

2. METHODS

This is a study that fits in quantitative methodologies of semi-experimental nature.

2.1 Sample

Our population consisted of the 182 elders institutionalised in the Santa Casa da Misericórdia de Bragança (SCMB). In 2014, a sample of 39 elders was drawn out of those using the method of convenience sampling. The following inclusion criteria were taken into account in the selection of the sample: being 65 years old or older; independent or slightly dependent; with no cognitive deficit; accepting to participate in the study. In the course of the study, two individuals were excluded, one for withdrawing, the other for having suffered an injury, thus resulting in a final sample of 37.

The sample is mostly comprised of females (73%). The age of the sampled individuals varies between 71 and 100 years old, with an average age of 85.41 years and a standard deviation of 6.53 years. Regarding the marital status, 2 individuals are single, 4 are married, and the remaining 31 are widowed. In terms of age groups, three individuals are aged between 65 and 74, sixteen are aged between 75 and 84, and the remaining nineteen are aged 85 or more. Concerning the education level of the respondents, 40.5% can't either read or write, 16.2% can read and write but didn't finish the 1st cycle of basic education, and the remaining finished the 1st or 2nd cycle of basic education. These results are shown in Table 1.

Table 1 - Sample distribution according to gender, marital status, age group and education level

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		n	%
Gender	Male	10	27.0
	Female	27	73.0
Marital Status	Single	2	5.4
	Married	4	10.8
	Widowed	31	83.8
Age	65-74	2	5.4
	75-84	16	43.2
	85 or older	19	51.4
	Average	Standard deviation	
	85.41	6.53	
Education Level	Can't read/write	15	40.5
	Can read and write	6	16.2
	1st or 2nd cycle of basic education	16	43.2

Based on the clinical characterisation, the entire sample reported to suffer from, at least, one pathology. About 78.4% reported to suffer from three or more pathologies. The vast majority reported the consumption of more than 5 drugs a day. The consumption average was of 5.11 drugs, with a standard deviation of 1.95.

2.2 Instruments for data collection

To accomplish the proposed objective, we used the EUROHIS-QOL-8 index (Pereira et al., 2011) and WHOQOL-OLD as data collecting instruments. The first assesses QOL, health and other areas of the life of the individuals; the second instrument, which

assesses QOL for older adults, is an experimental version, adapted and validated for Portugal by Vilar. A cooperation agreement with the team from the University of Coimbra was signed in order to use WHOQOL-OLD. This instrument also contained a questionnaire to assess personal and medical/clinical information. Folstein's Mini Mental State Examination (MMSE) scale was used to evaluate cognitive functioning and to ensure compliance with the inclusion criteria. To measure the dependency level in activities of daily living we resorted to the Barthel Index. EUROHIS-QOL-8 includes 8 questions with an answering format that varies between 1 and 5 points. The result is a global index that ranges from 8 to 40 points, the highest value corresponding to a better perception of QOL (Pereira et al., 2011). The WHOQOL-OLD scale validated for the Portuguese population includes 28 items, grouped in seven facets which concern Sensory Abilities (SA); Autonomy (A); Past, Present and Future Activities (PPFA); Social Participation (SP); Death and Dying (DD); Intimacy (I); and lastly, Family/Family Life (F). These items are organised in Likert-type answer scales. This instrument allows the results to be organised by facet or globally. The total sum of the facets varies between the minimum of 28 and the maximum of 140 points. Higher values correspond to a higher perception of QOL.

2.3 Procedures

After SCMB authorised the use of the instrument, an Informed Consent was drafted as well as a declaration of acceptance for the elders to join the study on QOL, freely and knowing all its procedures and purposes.

This study is characterised by two assessment moments (pre and post-intervention). The first data collection (pre-intervention) was in March, in a sample of 37 individuals divided into three groups. The first group was comprised of 20 individuals that, for more than a year, had already undergone active ageing activities offered by the institution. The remaining 17 individuals who weren't engaged in any type of active ageing activity were divided into two groups. The first (with nine elements) was subjected to an active ageing programme developed and carried out by us for 2 months. The second group (with 8 elements) was considered the control group (didn't engage in any active ageing programme). The activities developed in the programme cover issues such as: creativity; auditory, visual and olfactory short and long-term memory training; attention, concentration and observation; sensory stimulation; spatial perception; mental and perceptive agility; fine motor skills; group participation. The second moment of the assessment (post-intervention) was in June and in the beginning of July, in a sample of 37 individuals. The data collection instruments were the same used in the first assessment. The time spent with each elder was of about 45/60 minutes.

After collecting the information, the database was created in the software Statistical Package for the Social Sciences (SPSS), version 20 for Windows. Statistical measures, such as absolute (n) and relative (%) frequencies, average, and standard deviation, were used in order to do a descriptive analisys of the variables under study. Parametric and nonparametric tests were used for statistical inference. Student's t-test was used in two paired samples in order to establish a comparison between the averages of the two assessment moments. For each moment of assessment, the ANOVA test was used to compare between three independent groups. These tests are based on applicability assumptions such as presenting a normal distribution of the variables, tested with the Shapiro-Wilko test (used in samples of 50 individuals or less). Also, to apply the ANOVA test, the homogeneity of the variances between groups was verified with the Levene test. In the absence of normality, nonparametric tests were used. Thus, once the assumption of normality wasn't met, the Spearman correlation coefficient was used to evaluate the correlation between EUROHIS-QOL-8 and WHOQOL-OLD, based on both the total and the facets, for the two moments of assessment. Cronbach's alfa was used to analise the internal consistency of EUROHIS-QOL-8 and WHOQOL-OLD and its facets.

3. RESULTS

Cronbach's alfa was used to measure EUROHIS-QOL-8's internal consistency. In the first moment, it presented a value of 0.82 and of 0.80 in the second moment, figures that indicate good consistency. In the first moment, the average was 27.41 and the standard deviation was 4.74. In the second moment, the average was 29.11 and the standard deviation was 4.12. The comparison of the averages was made with the T-Test for paired samples. With an outcome of 0.004, the registered difference is statistically significant (Table 2). The scores of this global index for QOL indicate a significant improvement in the perception of quality of life between the two moments of assessment.

Table 2 - QOL assessment - EUROHIS-QOL-8, in two moments

	Moment 1	Moment 2
Internal Consistency	0.82	0.80
Average	27.41	29.11
Standard Deviation	4.74	4.12
T-Test for paired samples	t = – 3.10 vp = 0.004**	

The results by group gathered from the EUROHIS-QOL-8 index (Pereira et al., 2011) indicated that the group which, for more than a year, had already been engaged in the active ageing programme showed a statistically significant improvement in overall quality of life, from the first to the second moment, with a test value of 0.048 in the T-Test for paired samples.

The analysis of the global sample with WHOQOL-OLD resulted in Cronbach's alfas of 0.83 and 0.77 in the first and second assessments, respectively, which indicates good and reasonable internal consistency. In the first moment, the average was 100.51 and the standard deviation was 13.60. In the second moment, the average was 110.57 and the standard deviation was 11.98. Thus, and since the test value obtained in the T-Test for paired samples was of 0.001 (Table 3), we can state that the elders' perception of quality of life is good and has improved significantly between the two assessments.

Table 3 - QOL assessment - WHOQOL-OLD, in two moments

	Moment 1	Moment 2
Internal Consistency	0.83	0.77
Average	100.51	110.57
Standard Deviation	13.60	11.98
T-Test for paired samples	t = – 5.244 vp = 0.001**	

In relation to the index on quality of life - WHOQOL-OLD by groups, every group revealed an increase from the first to the second moment. While the group that had already been engaged in an active ageing programme for more than a year showed the highest scores, the control group had the lowest. This evolution between the two moments was statistically significant, particularly in the group that had been engaged in active ageing for a longer period of time, which presented a test value of 0.002.

Table 4 concerns the correlation of both instruments (EUROHIS-QOL-8 and WHOQOL-OLD) in the first moment. The table shows that the EUROHIS-QOL-8 index is correlated with the total result of WHOQOL-OLD and some of its facets (Sensory Abilities (weak correlation); Autonomy; Past, Present and Future Activities; and Social Participation) in a positive, moderate and significant way. The positive correlations between the two subindexes show that the elder's perception of quality of life will be higher if the perception of overall quality of life is also high. The same happens with the aforementioned facets. Correlations with significance at 1% are moderate because the coefficient ranges from 0.40 to 0.69. For Sensory Abilities, the correlation is weak (0.20 - 0.39) and presents significance at 5%. In the second moment, overall quality of life perception is positivly correlated with the elder's perception of quality of life, with significance, and it is a strong correlation (0.70 - 0.89). Since the coefficients range between 0.40 and 0.69, positive and moderate correlations with significance at 1%, were obtained in the following facets: Autonomy; Past, Present and Future Activities; Social Participation; Intimacy; and Family/Family Life. The correlation between the EUROHIS-QOL-8 index and the facet Death and Dying of WHOQOL-OLD is weak (0.20 - 0.39), with a significance level at 5%. In the second moment, the correlation with Sensory Abilities is not significant.

Table 4 - Spearman correlation between EUROHIS-QOL-8 and WHOQOL-OLD and its facets

	WHOQOL-OLD	SA	A	PPFA	SP	DD	I	F
EUROHIS-QOL-8 Moment 1	.61**	.37*	.43**	.65**	.52**	.24	.19	.19
EUROHIS-QOL-8 Moment 2	.71**	.13	.63**	.56**	.44**	.38*	.40*	.45**

* significance at 5%; ** significance at 1%

4. DISCUSSION

The socialdemographic data used in the characterisation of the sample denotes a gender representation imbalance, with a predominance of females. In Portugal, various studies about quality of life involving older people present the same results, such as the one developed by Martins (2012). This issue can be related to the excessive male mortality and to life expectancy, which we know to be higher in females (INE, 2013). As for marital status, most of our sample is comprised of widowed individuals (83.8). Dissolved marriage by death of the spouse affects mostly women due to excessive male mortality, which, in turn, justifies the disparity in crude widowhood rates by gender: 2.7 per one thousand men and 5.8 per one thousand women (INE, 2013).

Aiming the increase of quality of life, a nursing home must contribute to the stimulation of an active aging process, shall promote social integration by providing socio-cultural, leisure-recreational and occupational activities aiming the contribution to a climate of healthy relationship among residents and for the stimulation and maintenance of their physical and mental capacities, as it is recommended by Ordinance no. 67/2012 that defines the conditions of organization, operation and installation to be met by residential structures for elderly (Ordinance no. 67/2012 published on the 21st of March by the Ministry of Solidarity and Social Security, 2012).
In this study, the group that had been engaged in an active ageing programme for a longer period of time presented better scores in the quality of life index. In a study developed by Matimba (2014), that aimed to analyze the effect of a cognitive stimulation program in institutionalized old women, it was found a significant increase in quality of life indexes of the experimental group submitted to a cognitive stimulation program during three months.

In this study the EUROHIS-QOL-8 tool is moderately and significantly correlated with global WHOQOL-OLD. In a study develop by Martins (2012) that aimed to describe old people's quality of life based on EUROHIS-QOL-8 and WHOQOL-OLD, found a relationship between the degree of closeness of relations established by the elderly and the quality of life index. In the study of adaptation, validation and normalization of the WHOQOL-OLD for the Portuguese population, published in 2015 by Vilar, a high and significant correlation between the two tools used in the present study was found (EUROHIS-QOL-8 e WHOQOL-OLD).

CONCLUSIONS

With this study, we intended to know the perception of quality of life in old people Institutionalized in Santa Casa da Misericórdia de Bragança that were included in an active aging program. The sample included a group that had already been part of an active aging program for more than a year (provided by the institution), and another group submitted to an active aging program during two months (promoted by us), remaining a group of eight persons who were not submitted to any active aging program and that functioned as a control group. Results obtained with EUROHIS-QOL-8 and WHOQOL-OLD tools showed that the group that was included in an active aging program for more than a year was the one with better results in QOL index with statistical relevance when compared the first assessment moment (pre-intervention) and the second one (post-intervention), fact that highlights the importance of active aging programs implemented a long time ago. In face of these results, we suggest that nursing homes must bet on old people's integration into active aging programs since their admission, by encouraging group's participation, the physical and mental capacities stimulation that aim the increase of self-esteem and wellbeing, as well as the decrease of the aging process and the reduction / prevention of disabilities.

As limitations of the present study we emphasize the fact that these results cannot be extrapolated, since the studied sample is small in size and refers to a specific spatial, temporal and cultural context. We believe that it would be appropriate to continue this type of study with a larger sample and over a longer period of time, using the same WHOQOL-OLD, as it represents a specific tool of the generic instruments, being a useful alternative in the assessment of the quality of life of the elderly, because it includes fundamental aspects not covered in the original instruments for non-elderly populations.

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A INTERVENÇÃO DO FISIOTERAPEUTA NO DOENTE COM DEMÊNCIA EM CUIDADOS PALIATIVOS.

THE INTERVENTION OF THE PHYSIOTHERAPIST IN THE PATIENT WITH DEMENTIA IN PALLIATIVE CARE.

LA INTERVENCIÓN DEL FISIOTERAPEUTA EN EL PACIENTE CON DEMENCIA EN CUIDADOS PALIATIVOS.

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RESUMO

Introdução: Atualmente existe um elevado número de pessoas com diagnóstico de demência. No âmbito dos cuidados Paliativos as intervenções de reabilitação são muitas vezes minoradas. Desta forma è importante o estudo de medidas não farmacológicas com vista a melhorar o estado funcional e qualidade de vida destes doentes.

Problemática: Qual a intervenção do fisioterapeuta no doente com demência em cuidados paliativos?

Objetivos: Nesta revisão sistemática da literatura pretendemos identificar quais as intervenções que os fisioterapeutas utilizam com doentes com demência em cuidados paliativos e quais os benefícios dessas técnicas.

Métodos: Desenho do Estudo - Revisão Sistemática da Literatura;

Foram incluídos 12 estudos com um intervalo temporal de 2003 a 2015, em que são abordadas técnicas que possam ser utilizadas por fisioterapeutas no tratamento ou alívio do sofrimento e na melhoria de qualidade de vida destes doentes. Os artigos científicos foram encontrados em diversas bases de dados online e de texto integral tais como: Biblioteca do conhecimento Online, Pubmed e PEdro.

Resultados: Nesta revisão sistemática da literatura foram encontradas diversas técnicas não farmacológicas que contribuem para o aumento da qualidade de vida dos doentes com demência. Dentro destas técnicas encontradas são referidas o exercício aeróbico, manutenção da força muscular, treino de equilíbrio, o toque, treino cognitivo, intervenções comportamentais, estimulação cognitiva, estimulação elétrica transcutânea, musicoterapia, reminiscência, treino de atividades da vida diária (AVD´s), massagem, terapia de recreação, sala snoezelen, estimulação multissensorial, apoio e psicoterapia, e relaxamento muscular.

Conclusões: Dentro dos programas multidisciplinares analisados nesta revisão o Fisioterapeuta faz todo o sentido, sendo este o profissional que utiliza o maior número de técnicas não farmacológicas abordadas. Estes programas podem ser bastante benéficos para que a diminuição da cognição ocorra de forma mais lenta e consequentemente permita a manutenção das faculdades físicas e o aumento da qualidade de vida do doente e dos seus cuidadores. O exercício é a técnica mais estudada, com resultados positivos na qualidade de vida. Constatamos que existe pouca evidência da intervenção do fisioterapeuta na fase terminal do doente com demência.

Palavras-chave: Dementia ; Alzheimer's; Physical therapy; Physiotherapist; Palliative care

ABSTRACT

Introduction: Currently there are a large number of people diagnosed with dementia. In the field of palliative care, rehabilitation interventions are often lessened. Thus, it is important to study non-pharmacological measures to improve the functional status and quality of life of these patients.

Issue: What´s the intervention of the physiotherapist in the patient with dementia in palliative care?

Objectives: In this systematic review of the literature we intend to identify which interventions the physiotherapists used on patient with dementia in palliative care and the benefits of these techniques.

Methods: Study design - Systematic Literature Review

We've inclued 12 studies with a time interval 2003-2015, in which they are addressed techniques that can be used by physiotherapists in the treatment or relief of suffering and improving quality of life of patients. Scientific papers were found in several online databases and full text such as: Online Knowledge Library, B-On, Pubmed and PEdro.

Results: In this systematic review of the literature found several non-pharmacological techniques that contribute to improving the quality of life of patients with dementia. These techniques are exercise aerobic, maintenance of muscle strength, equilibrium training, touch, cognitive training, behavioral interventions, cognitive stimulation, transcutaneous electrical stimulation, exercise, music therapy, reminiscence , training activities of daily living, massage, recreation therapy, snoezelen room, multi-sensory stimulation, support and psychotherapy, and muscle relaxation.

Conclusions: Within the multidisciplinary programs analyzed in this review the physiotherapist makes perfect sense, being the professional that uses the greatest number of non-pharmacological techniques covered. These programs can be very beneficial for decreased cognition occurring more slowly and consequently allows the maintenance of the physical and increasing the patients quality of life and their caregivers. Exercise is the most studied technique with positive results on quality of life. We found that there is little evidence of physical therapist intervention in the terminal phase of the patient with dementia.

Keywords: Dementia; Alzheimer's; Physical therapy; Physiotherapist; Palliative care.

RESUMEN

Introducción: En la actualidad existe un alto número de personas con diagnóstico de demencia. En el contexto de los cuidados paliativos, las intervenciones de rehabilitación a menudo son disminuidas. Por lo tanto, es importante el estudio de las medidas no farmacológicas para mejorar el estado funcional y la calidad de vida de estos pacientes

Problema: ¿Cuál es la intervención del fisioterapeuta en el paciente con demencia en los cuidados paliativos? **Objetivos:** En esta revisión sistemática de la literatura que tienen la intención de identificar las intervenciones que los fisioterapeutas utilizan en los pacientes con demencia en los cuidados paliativos y los beneficios de estas técnicas. **Métodos:** Diseño del estudio: Revisión sistemática de la literatura Se incluyeron 12 estudios con un periodo de tiempo 2003-2015, en que están las técnicas que se pueden utilizar por los fisioterapeutas en el tratamiento o alivio del sufrimiento y mejorar la calidad de vida de los pacientes. Los documentos fueron encontrados en varias bases de datos online: B On, Pubmed y PEdro.

Resultados: En esta revisión sistemática de la literatura se encontraron varias técnicas no farmacológicas que contribuyan a mejorar la calidad de vida de los pacientes con demencia. Dentro de estas técnicas se observan ejercicio aeróbico, el mantenimiento de la fuerza muscular, el entrenamiento del equilibrio, el tacto, el entrenamiento cognitivo, las intervenciones conductuales, estimulación cognitiva, estimulación eléctrica transcutánea, la terapia musical, la reminiscencia, las actividades de capacitación de la vida diaria (AVDs), el masaje, terapia de recreación, snoezelen, la estimulación multisensorial, el apoyo y la psicoterapia, y la relajación muscular.

Conclusiones: Dentro de los programas multidisciplinares analizados en esta revisión el fisioterapeuta es un elemento clave, siendo el profesional que utiliza el mayor número de técnicas no farmacológicas discutidas. Estos programas pueden ser muy beneficos para que la disminución de la cognición produzca más lentamente y por lo tanto permite el mantenimiento de la capcidad física y el aumento de la calidad del paciente y sus cuidadores. El ejercicio es la técnica más estudiado con resultados positivos en la calidad de vida. Hemos encontrado que hay poca evidencia de la intervención del fisioterapeuta en la fase terminal del paciente con demencia.

Palabras clave: Dementia; Alzheimer's; Physical therapy; Physiotherapist; Palliative care

INTRODUTION

Currently there are a large number of people diagnosed with dementia. This happens because of the current aging of the population and increase in the average life expectancy (Burton, et al., 2015; Kumar, et al., 2014). Alzheimer's disease and vascular dementia are the most common types of dementia (Burton, et al., 2015; Viola, et al., 2011; McLaren, LaMantia, & Callahan, 2013).

The sedentary lifestyle also contributed to the decline of cognitive function, irritation, confusion, depression and fatigue (Winchestera, et al., 2013).

Dementia is characterized by loss of brain function. Its etiology may be varied and its behavior depends on the affected brain area such as the extent of the lesion. This disease is characterized by alterations in memory, thought and spatio-temporal orientation. Consequently, motor changes may occur with decreased physical capacity causing alterations in the quality of life and in performing basic activities of daily living. Patients with dementia suffer from alterations in proprioception, visual and vestibular acuity with negative repercussions on gait and physical performance. Such change contribute to emotional and behavioral changes both in the patient and in their caregivers and family (Bossers, Scherder, Boersma, Hortoba, Woude, & Heuvelen, 2014; Burton, et al., 2015).

Family members goes through varying degrees of feeling, loss, depression, anxiety, guilt, frustration and hopelessness, and often do not receive an opportunity to express their feelings, and it is important for health professionals provide family and caregivers with space and time to express their feelings and concerns(Sampson, et al., 2008).

Dementia requires that be recognized as a disease requiring palliative care. Interventions should be carefully chosen to ensure that the quality of life of the person with dementia and their caregivers and family members is be improved or maintained. Family members should be educated and encouraged by health professionals to actively participate in discussions related to the patient's condition (Kumar & Kuriakose, 2013).

The final phase is often defined as a set of symptoms that include inability to orally feed, changes in breathing patterns, weight loss, lack of mobility, inability to communicate, incontinence, and dependence on the activities of daily living. The language is non-verbal and in this way it becomes imperative to be sensitive to body language, reactions, gestures and facial expressions (Kumar & Kuriakose, 2013).

In order to analyze the evolution and the phase in which the dementia is, there are several established evaluation tools that allow to analyze the functionality, the accomplishment of the activities of the daily life (ADL), the speech, the cognitive function and the degree of dependence of the Caregiver (Bossers, Scherder, Boersma, Hortoba, Woude, & Heuvelen, 2014; McLaren, LaMantia, & Callahan, 2013).
There is currently no medical treatment that can reverse or stop disease progression (Bossers, Scherder, Boersma, Hortoba, Woude, & Heuvelen, 2014).
In the field of palliative care, rehabilitation interventions are often lessened, and as a result little is known about the effectiveness of these interventions in this patients (Montagnini , Lodhi, &Born, 2003).
Thus, it is important to study non-pharmacological measures to improve the functional status and qualityof life of these patients.

METHODS

In order to check the intervention of the physiotherapist in the patient with dementia in palliative care we directed a search for studies that answered the main and secondary questions respecting: What is the intervention of the Physiotherapist in the Patient with Dementia in Palliative Care? What are the techniques used by Physiotherapists in the intervention of the Patient with Dementia in Palliative Care?
As objectives to answer the questions, we define:

-Identify the interventions that Physical Therapists use in patients with dementia in Palliative Care;
-Identify the benefits of techniques used by physiotherapists in patients with dementia in palliative care

We've inclued 12 studies with a time interval 2003-2015, in which they are addressed techniques that can be used by physiotherapists in the treatment or relief of suffering and improving quality of life of patients.
As inclusion and exclusion criteria of this study we proposed the following:
Inclusion Criteria: We included qualitative and quantitative studies since 2003; Studies that address techniques used or that can be used by physiotherapists in the treatment or relief of suffering as well as in the quality of life of patients with dementia in palliative care and their caregivers / family.
Exclusion Criteria: We excluded studies that did not include patients in the context of palliative care; Studies that do not integrate techniques that are not used by physiotherapists.
The following search descriptors were used: demência, cuidados paliativos, fisioterapia ,Physicaltherapy, physiotherapy, physicaltherapist, dementia, vascular dementia, Alzheimer, palliativecare, end of life.
The following parameters were used to select the articles: Participants, Interventions, Comparisons, Outcomes and Study Design (PICOD)

Table 1- PICOD Table

P	Participants	Who was studied?	Physiotherapists, patients with dementia in the contexto of palliative care.	Keywords Demência, cuidados paliativos, fisioterapia, physicaltherapy, physiotherapy, physicaltherapist, dementia, vascular dementia
I	Interventions	What was done?	Control of symptoms, promotion of improvment of quality of life.	
C	Comparisons	They may or may not exist.	Which are?	
O	Outcomes	Results, effects, consequences.	Control of symptoms, promotion of improvment of quality of life.	
D	Study design	How the evidence was collected	Qualitative and quantitative	

Scientific literature published between 2003 and 2015 was included in several online and full text databases: Online Knowledge Library, Pubmed, PEdro, we also used as a complement to search for some articles, the Google Scholar
We find that the United States is the one that most deals with this subject, followed by the United Kingdom and Australia. Most of the documents were published between 2013 and 2014.

RESULTS

Non-pharmacological strategies can improve the quality of life of patients with dementia and consequently the quality of life of their caregivers and family members (Olazarán, et al., 2010).
In a systematic review of efficacy, the following were described as nonpharmacological strategies for intervention in dementia: cognitive training, behavioral interventions, cognitive stimulation, transcutaneous electrical stimulation, physical exercise, music therapy, reminiscence, daily life activities training, Massage, touch, recreation therapy, snoezelen room, multisensory stimulation, psychotherapy and muscle relaxation. The results of this review indicate that non-pharmacological strategies may have a beneficial and accessible contribution to improving care delivery for patients with dementia, with a positive impact on their caregivers and their families(Olazarán, et al., 2010).
Luciane Viola et al. Studied a program that included only non-pharmacological measures such as cognitive rehabilitation, computer-aided cognitive training, speech therapy, occupational therapy, painting, writing, speaking and physiotherapy (balance training, fall prevention, Muscle stretching sessions). Caregivers attended group education and counseling sessions. With the application of this program, the patient's neuropsychiatric symptoms were reduced, the caregiver's degree of concern decreased, and the depressive symptoms of both were reduced. It was found that cognitive function remained stable and that the quality of life improved (Viola, et al., 2011).
McLaren, LaMantia & Callahan have developed a systematic review of the literature in which the aim was to determine whether non-pharmacological measures such as exercise, occupational therapy and other multidisciplinary interventions contribute to delayed functional decline in community-dwelling dementia patients. A positive effect on performance and quality of life was observed and significant positive results were obtained in functional performance.
In the study by Montagniniet et al, they concluded that patients diagnosed with dementia after a physiotherapy program improved their functional status and quality of life and increased serum albumin levels compared to patients without a diagnosis of dementia (Montagnini , Lodhi, & Born, 2003). Improvement in functional status and quality of life is associated with increased serum albumin levels. Albumin is a marker of nutritional status and a predictor of life expectancy in palliative care. It may also be used as a functional improvement marker for rehabilitation in patients in palliative care (Montagnini , Lodhi, & Born, 2003).
One of the strategies that promote the decline of the decline of Alzheimer's disease is the regular p In a study cited by Henderson, it was concluded that long-term physical exercise reduces the number of amyloid plaques as well as levels of amyloid soluble in the hippocampus and improved learning compared to the control group ractice of aerobic exercise (Henderson, 2014). In a study cited by Henderson, it was concluded that long-term physical exercise reduces the number of amyloid plaques as well as levels of amyloid soluble in the hippocampus and improved learning compared to the control group (Henderson, 2014).Exercise has a positive effect on inflammation, stress and immune system, increases levels of the neurotrophic factor and these proteins can support neuronal survival, improve synaptic plasticity, promote the formation of new blood vessels and lead to the formation of new neurons in the hippocampus (Henderson, 2014).
Willem et al developed a program of aerobic exercise (walking) in conjunction with strength training for lower limbs in order to activate the large muscle groups responsible for gait, balance and mobility. The authors decided to compare a group that performed this exercise program with a group that would walk with the same duration and frequency. The group that performed the exercise program obtained slight cognitive and motor improvements however without significant differences (Bossers, Scherder, Boersma, Hortoba, Woude, & Heuvelen, 2014).
Exercise programs such as balance training, muscle strength training for the lower limbs contribute positively to the prevention and reduction of falls in these patients with a positive impact on quality of life (Burton, et al., 2015).
Kumar et al developed a plan of 10 treatment sessions. This plan included relaxation (contract / relax); Strength maintenance exercises; Mobility exercises (range of motion, imitation of movements, exercises with medicinal ball); Training of activities of daily living (personal body care, personal valuation, dressing / undressing, household chores); Cognitive exercises (reading aloud, jigsaw and dual task) and recreational activities. It was verified that the implementation of this plan of activities contributed to the increase of the quality of life, with emphasis on the physical and psychosocial components (Kumar, et al., 2014).
Physical activity programs influence the performance of activities of daily living in a positive way. Thus the decline in the performance of activities of daily living may be due to the progression of the disease but also due to physical inactivity (Burge, Kuhne, Berchtold, Maupetit, & von Gunten, 2012).

Physical activity associated with music has been shown to improve the performance of patients in advanced stages of dementia. Physical activity maked in group and accompanied by music may more easily respond to the expectations of patients with dementia and increase their adherence to exercise (Burge, Kuhne, Berchtold, Maupetit, & von Gunten, 2012).
The touch in people with dementia at the end of life is as or more important as at other stages of life. Just the simple touch, without techniques, cause relaxation in the dementia patient thus promoting an improvement of their psychological and affective state (Nicholls, Chang, Johnson, & Edenborough, 2003).

CONCLUSIONS

Within the multidisciplinary programs analyzed in this review, the physiotherapist is the professional that uses the largest number of non-pharmacological techniques addressed. It is important to provide quality of life for the patient with dementia but also to approach the family and find strategies in which both parties can improve their quality of life.
Physical exercise stands out as the great intervention of the physiotherapist in patients with dementia in palliative care, and can be applied as aerobic exercise, resistance training, balance training, strengthening, flexibility, walking, teaching the caregivers about exercises and training of the activities of the daily life (Montagnini , Lodhi, & Born, 2003) (Burton, et al., 2015)
Exercise can be very beneficial for the maintenance of the patientfunctionality, contributing for wath decrease of cognition occurs more slowly and consequently allows the quality of life of the patientes and their caregivers (Montagnini , Lodhi, & Born, 2003).
The touch also seems to promote an improvement in the psychological and affective state of both the patient and the caregivers and familys.
We could verify that there is little evidence of what intervention of the physiotherapist in the patient with dementia in palliative care, less evidence when it comes to the terminal phase.
In sum, the average life expectancy has increased, which has contributed to the increase in the number of people with dementia. It is increasingly important to analyze non-pharmacological strategies, as they may have a beneficial and accessible contribution to improving care delivery for patients with dementia, with a positive impact on their caregivers and their families (Olazarán, et al., 2010).

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VIGILÂNCIA E PREVENÇÃO DE VETORES CULICÍDIOS - O CASO PORTUGUÊS

SURVEILLANCE AND PREVENTION CULICIDAE VECTORS - THE PORTUGUESE CASE

VIGILANCIA Y PREVENCIÓN DE VECTORES CULICIDAE - EL CASO PORTUGUÉS

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RESUMO

Introdução: Dengue e Zika são considerados uma doença do século XXI re-emergentes sendo um dos principais problemas de saúde pública no mundo, não só porque afecta milhares de pessoas, uma vez que o mosquito Aedes aegypti tende a reproduzir-se em casas, mas também porque é considerada uma das mais importantes doenças virais transmitidos pelos animais.

A vigilância da saúde pela Saúde Ambiental do meio ambiente, tem como missão analisar, prevenir e corrigir os riscos para a saúde, que são ambiental ou potencial. É neste sentido que a saúde ambiental é tão importante para erradicar a doença, e, entretanto, evitar que o vírus afete a saúde humana.

Objetivos: Rastreamento da presença de Vetores Culicídios em Portugal.

Métodos: O estudo é baseado em dados do programa DGS e INSA, Revive, com chapeamento da presença de mosquitos e larvas que podem causar contaminação e doenças provenientes de mosquitos. A análise dos resultados permite avaliar a necessidade do cuidado profiláctico a ter no nosso país, especialmente na Madeira, que pela sua localização e clima pode favorecer a emergência destes.

Resultados: As amostras e os dados recolhidos pelo programa REVIVE não detectaram a presença dos mosquitos vírus em Portugal continental, no entanto as alterações climáticas que Portugal atravessa pode causar o aparecimento de mosquitos vetores de transportadores, sendo pertinente a educação pública para adoção de medidas preventivas da proliferação de mosquitos portadores.

Conclusões: Apesar de não existirem mosquitos, importa educar o público para medidas de prevenção da picada do mosquito. Assim, este estudo fornece uma série de soluções para minimizar a proliferação destes vectores epidemiológicos.

Palavras-chave: Culicídios; Dengue; Zika; Saúde Ambiental

ABSTRACT

Introduction: Dengue and Zika are considered a disease of the XXI re-emerging century are a major public health problems in the world, not only because it affects thousands of people, since the mosquito Aedes aegypti tends to reproduce in homes but also because it is considered one of the most important viral diseases transmitted by animals.

Health surveillance for Environmental Health of the environment, and its mission is to analyze, prevent and correct the health risks, which are environmental or potential. It is in this sense that environmental health is as important to end this disease, and in the meantime to prevent it does not affect human health.

Objetives: Tracking the presence of Culicidae Vectors in Portugal.

Methods: The study is based on data from DGS program and INSA, Revive, which plating the presence of mosquitoes and larvae that can cause contamination and diseases originating from mosquitoes, the analysis of these data and the other allows us to see the need for prophylactic care to have in our country, especially in Madeira, which, for its location and climate can foster the emergence of these.

Results: Samples and data collected by the REVIVE program did not detect the presence of the virus mosquitoes in continental Portugal, however climate change that Portugal crosses can cause the onset of mosquito vectors of carriers, so you want to public education for preventive measures can combat the proliferation of mosquitoes mosquito carriers.

Conclusions: Although there are no mosquitoes, as educate the public for mosquito prevention measures. Thus, this study provides a number of solutions to minimize the proliferation mosquito vectors.

Keywords: Culicids; Dengue; Zika; Environmental Health

RESUMEN

Introducción: Dengue y Zika se consideran una enfermedad del siglo XXI reemergentes son uno de los principales problemas de salud pública en el mundo, no sólo porque afecta a miles de personas, ya que el mosquito Aedes aegypti tiende a reproducir en los hogares, sino también porque es considerada una de las enfermedades virales más importantes transmitidas por los animales.

La vigilancia de la salud por la Salud Ambiental de carreras del medio ambiente, y su misión es analizar, prevenir y corregir los riesgos para la salud, que son el medio ambiente o potencial. Es en este sentido que la salud del medio ambiente es tan importante para poner fin a esta enfermedad, y al mismo tiempo para evitar que no afecta a la salud humana.

Objetivos: El seguimiento de la presencia de vectores culícidos en Portugal.
Métodos: El estudio se basa en datos del programa de DGS e INSA, Revive, que plateando la presencia de mosquitos y larvas que pueden causar la contaminación y las enfermedades provenientes de mosquitos. El análisis de estos datos y el otro nos permite avaliar la necesidad de profilaxis se preocupan de tener en nuestro país, especialmente en Madeira, que, por su ubicación y el clima puede favorecer la aparición de éstos.
Resultados: Las muestras y los datos recogidos por el programa REVIVE no detectaron la presencia de los mosquitos del virus en Portugal continental, sin embargo el cambio climático que Portugal cruza puede causar la aparición de mosquitos vectores de portadores, por lo que desea a la educación pública para las medidas preventivas pueden combatir la proliferación de los mosquitos portadores de mosquitos.
Conclusións: Apesar de que no hay mosquitos, como educar al público para las medidas de prevención de mosquitos. Por lo tanto, este estudio proporciona una serie de soluciones para reducir al mínimo los vectores de la proliferación de mosquitos.

Palabras clave: Culicidae; Dengue; Zika; salud Ambiental

INTRODUCTION

Dengue is considered one of the re-emerging diseases of the XXI century as major public health problems in the world, not only because it affects thousands of people, since the mosquito Aedes aegypti tends to reproduce in homes but also because it is considered one of the most important viral diseases transmitted by animals.
In health surveillance Environmental Health Race of the environment and its mission is to analyze, prevent and correct the health risks, which are environmental or potential. It is in this sense that environmental health is as important to end this disease, and in the meantime to prevent it does not affect human health.

1. THEORETICAL FRAME WORK

According to the National Adaptation Strategy to Climate Change published in May 2015, the Environmental Portuguese Agency *"With climate change are potentially social and environmental determinants affected that pose risks to health. Examples are related to the increase of diseases with air pollution and allergens, extreme events (floods and droughts), increased frequency and intensity of heat waves, changes in the distribution and incidence of vector-borne diseases and changes in the availability and quality of water and-infections toxic, among others. Climate change could lead to significant changes. geographical and seasonal distribution and spread of vector-borne diseases These diseases are of great importance and, in Portugal, the most worrying are associated with Aedes aegypti mosquitoes (especially dengue) species Aedes are present in nearby regions - ... Aedes aegypti in the Autonomous region of Madeira and in Spain Aedesalbopictus"* (Agência Portuguesa do Ambiente, 2015).
According to the (WHO, 1997) Dengue is the most important viral infection transmitted by mosquitoes. In recent decades, the incidence of dengue has grown dramatically around the world, it is estimated that over 2.5 billion people (40% of world population) are at risk of contracting dengue and occurs 50000000-100000000 of infections per year (World Health Organization, 1997).
With increasing temperature, as a consequence of climate change, it is expected favorable to increase the number of months for the development of such vectors and consequent increased risk of infectious diseases caused by them.
The expression vectors of bodies responsible for biological transmission (or mechanical) active pathogen among different vertebrate hosts. Currently, in Europe, they are known viral encephalitis transmitted by mosquitoes (Abrantes & Silveira, 2009). Factors such as population density of vectors and their hosts, the prevalence of pathogenic adapted to vectors and their hosts, the immune status of the human population and the local environmental conditions are crucial to the process of establishing place transmission of disease (Rodhain & Perez, 1997).
In all vector-borne diseases, the risk of transmission is not only dependent on the number of infected vectors in the region, but also the possible contact with humans, ie, the conditions that are provided for the dissemination of these (Câmara Municipal de Cascais, 2011).
The origin of the mosquito Aedes aegypti is African but are known various regions of the world affected by this disease. While the first outbreak of the disease on European soil has been registered in 1920, the mosquito was first sighted on the island of Madeira in 2005, the city of Funchal, more precisely in the parish of Santa Luzia, following reports and some reactions skin population were subsequently linked to a mosquito bite.

This type of mosquito takes less to the common mosquito and has black body with white-silver stripes. The distinguished male female, among other features, feathers contain more antennas.
The female mosquito lays eggs individually in places able to accumulate water - breeding. It is the woman who bites because it has no blood to the maturation of the eggs and the male feeds on sugary liquids. This species can survive for a year in tropical and subtropical climates. (IASaúde, 2012) The life cycle to complete ranges from 7 to 15 days and consists of four stages: egg, larva, pupa and finally adult mosquitoes.
The archipelago is located in the subtropical region, with a mild climate both in winter and summer, however, and due to pressure systems during the summer months, gives an abundant rainfall (Santos & Aguiar, 2006).
The cases of the disease on the island began to emerge in October of 2012 and since then, several efforts have been gathered by the city of Funchal, such as the creation of a Municipal Plan Against Mosquito and various activities carried out by IASAÚDE technicians, IP- RAM (composed of environmental health technicians). These activities have focused on monitoring; to control; prevention; and placement and collection of traps for eggs, larvae and adult mosquitoes and performance REVIVE - National Surveillance Culicidae vectors Program, etc. This is because it is known that it is difficult to eliminate the mosquito, so it is necessary to use awareness and prevention, starting with the elimination or reduction of reproduction. (IASaúde, 2012) (Câmara Municipal do Funchal, 2012). It should be noted that, dat, which were not identified in mainland Portugal, alien / invasive. All species identified are part of the Culicidae fauna.
The National Programme for Culicidae Vectors Surveillance, approved in 2007, is a collaboration between institutions of the Ministry of Health and aims to implement a vector network surveillance system (REVIVE), education / information across cultures, periodic or sporadic, vector culicids, surveillance of activity mosquito vectors, characterization of the species and seasonal occurrence in selected locations, as well as the timely detection of the introduction of exotic mosquitoes, particularly Aedes albopictus and Aedes aegypti, and send alerts to appropriate control measures (Chivian, 2008).
Crops under REVIVE program are conducted using CDC traps with bait CO2 and vacuum cleaners to catch live mosquitoes. When performing cultures the minimum and maximum temperatures, relative humidity and geo-reference are recorded. The frequency of these ranges from May to October in Portugal; April to November, on the island of Madeira; and throughout the year in harbors and airports.
To perform the capture of adult mosquitoes, the emphasis is the twilight period or evening to make the crop, since it is the day time they reach the perfect conditions for food, the place to be on the periphery of urban centers, preferably in places with natural or artificial lakes. So to make this capture are used CDC light traps, which are composed of a flashlight that attracts mosquitoes, a fan that sucks and a bag where they are pushed by the fan.
This trap has a photo sensor that allows the electric system only works when it starts to get dark until dawn. Throughout this trap can be placed bait or not. Typically, the bait inside the STIR program is a bag with dry ice, since the release of CO2 simulates respiration of an animal, thereby increasing the probability of success and capture efficiency.
Usually in Public Health Units in Portugal, these traps are placed at the end of the day and meet in the morning. For the harvest of larvae and pupae, you should choose a location near populations and shrimp pots are used for this collection, and these are placed in collection jars.
The frequency of collection should be defined by the Public Health Unit. After capturing the samples are sent to the National Institute of Health Dr. Ricardo Jorge (INSA), packed in refrigerated system, up to 3 days after the start of field work. All samples arrive accompanied by their adult harvest newsletters and immature stages mosquitoes.
According to the Centers for Disease Control and Prevention, the United States, focusing on health promotion and disease prevention created that will healthy homes, workplaces, schools and communities so that people can live long and productive lives and further reduce health care costs. Better health improves population and economy.
It is also important the role of Environmental Health, in the sense that develops identification activities and characterization of risk factors for health originating in the environment, such as the Environmental Health aims to Prevention and Health Promotion, and its intervention in case risk.

2. METHODS

The study is based on data from DGS and INSAprogram, Revive, which plating the presence of mosquitoes and larvae that can cause contamination and diseases originating from mosquitoes, the analysis of these data and the other allows us to see the need for prophylactic care to have in our country, especially in Madeira, which, for its location and climate can foster the emergence of these.

3. RESULTS

Samples and data collected by the REVIVE program did not detect the presence of the virus mosquitoes in continental Portugal, however climate change that Portugal crosses can cause the onset of mosquito vectors of carriers, so you want to public education for preventive measures can combat the proliferation of mosquitoes mosquito carriers.

CONCLUSIONS

Although there are no mosquitoes, as educate the public for mosquito prevention measures. Thus, this study provides a number of solutions to minimize the proliferation mosquito vectors. Prevention is the best measure to be applied to the elimination of all disease. However, for this it requires efforts of all people to combat the problem at source, ie in this case, eliminate potential mosquito breeding sites. Awareness and education to this problem is an essential and necessary weapon for effective prevention (Instituto de Medicina Molecular da Faculdade de Medicina da Universidade de Lisboa & Universidade Federal do Rio de Janeiro, 2007).

Climate change and the expected effects on the distribution and prevalence of the disease in Portugal can lead to the emergence of new demands on health systems, requiring an adaptation work to be done as soon as possible to prevent and reduce the extent of the effects on the population.

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FIBRA ALIMENTAR: PRÁTICAS ALIMENTARES E CONHECIMENTOS EM DIFERENTES REGIÕES DO GLOBO

DIETARY FIBRE: EATING HABITS AND KNOWLEDGE IN DIFFERENT REGIONS OF THE GLOBE

FIBRA ALIMENTARIA: PRACTICAS ALIMENTARES Y CONOCIMIENTO EN DIFERENTES REGIONES DEL GLOBO

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RESUMO

Introdução: A fibra dietética (FD) é um componente importante de uma dieta saudável e o seu consumo constitui uma ferramenta que pode ser utilizada para diminuir os factores de risco para muitas doenças.

Objetivos: Porque a FD apresenta tantos benefícios para a saúde, este estudo teve como objetivo comparar os hábitos alimentares e atitudes em relação à rotulagem, bem como o conhecimento sobre alimentos ricos em fibras e seus efeitos na saúde em três países situados em diferentes partes do globo (Argentina, Portugal e Hungria).

Métodos: Foi realizado um estudo descritivo transversal usando uma amostra de conveniência não-probabilística de 1525 participantes, mediante inquérito por questionário.

Resultados: Os resultados mostraram que a ingestão de FD ficou, nos três países, abaixo as doses recomendadas, e as pessoas em geral não se preocupam muito sobre a informação nutricional nos rótulos dos alimentos ou o seu conteúdo em FD. A internet surgiu como um meio de comunicação muito importante que as pessoas usam para obter informações sobre FD ou uma alimentação saudável, enquanto os hospitais e centros de saúde parecem ter pouco sucesso naquele que deveria ser o seu papel educativo.

Conclusões: Em geral, os entrevistados mostraram um nível moderado de conhecimento sobre a natureza e as fontes de FD, mas um melhor conhecimento sobre os seus efeitos na saúde humana, sendo este semelhante entre os países em estudo.

Palavras-chave: Alimentos ricos em fibras; fibras alimentares; fontes de fibra; hábitos alimentares; inquérito por questionário.

ABSTRACT

Introduction: Dietary fibre (DF) is an important component in a healthy diet and its consumption constitutes one tool that can be used to lower risk factors for many diseases.

Objetives: Because DF has so many health benefits, this study aimed at comparing the eating habits and attitudes towards labelling as well as the knowledge about fibre rich foods and their health effects in three countries situated in different parts of the globe (Argentina, Portugal and Hungary).

Methods: A descriptive cross-sectional study was carried out on a convenience non-probabilistic sample of 1525 participants, by questionnaire survey.

Results: The results showed that the ingestion of DF was below the recommended dosages in the three countries, and people in general do not care much about the nutritional information in the food labels or the contents in DF. Internet appeared as a very important media that people use to get information about DF or healthy eating, while hospitals and health centre seem to fail somewhat on their educational role.

Conclusion: In general, the respondents showed a moderate level of knowledge about the nature and sources of DF but a better knowledge about its effects on human health, being this similar among the countries at study.

Keywords: Dietary fibre; eating habits; fibre rich foods; questionnaire survey; sources of fibre.

RESUMEN

Introducción: La fibra dietética (FD) es un componente importante de una dieta saludable y su consumo es una herramienta que se puede utilizar para disminuir los factores de riesgo para muchas enfermedades.

Objetivos: Debido a que el FD tiene muchos beneficios para la salud, este estudio tuvo como objetivo comparar los hábitos alimenticios y actitudes en relación con el etiquetado y el conocimiento de los alimentos ricos en fibra y sus efectos sobre la salud en tres países ubicados en diferentes partes del mundo (Argentina, Portugal y Hungría).

Métodos: se realizó un estudio transversal con una muestra de conveniencia no probabilística de 1525 participantes de la encuesta de cuestionario.

Resultados: Los resultados mostraron que el consumo de FD fue en los tres países, por debajo de las dosis recomendadas, y la gente en general no les importa mucho acerca de la información nutricional en las etiquetas de los alimentos o su contenido en FD. El Internet se ha convertido en un medio de comunicación muy importante que la gente utiliza para obtener información sobre FD o una dieta saludable, mientras que los hospitales y centros de salud parecen fallar un poco en lo que debería ser su función educativa.

Conclusións: en general, los encuestados mostraron un moderado nivel de conocimiento sobre la naturaleza y las fuentes de FD, pero una mejor comprensión de sus efectos sobre la salud humana, que es similar entre los países estudiados.

Palabras clave: Alimentos ricos en fibra; encuesta por cuestionario; fibra dietética; fuentes de fibra; hábitos alimentarios.

INTRODUCTION

Dietary fibre (DF) represents a wide spectrum of polysaccharides that escape digestion in the human gastrointestinal tract. However, this definition of dietary fibre as food that is not digested in the upper GI tract has led to research about the roles of fibre on the fermentation processes that occur in the colon and most recently the benefits to the gut have been more generally debated n.d.). Present definitions of dietary fibre cover an enormous range of divergent indigestible carbohydrate entities which have demonstrated different effects in the human body (Jones, 2014; Macagnan, da Silva, & Hecktheuer, 2016).

DF is an important component in a healthy diet and its consumption constitutes one tool that can be used to lower risk factors for cardiovascular disease and type 2 diabetes mellitus, among other diseases (Ma & Mu, 2016; Mackie, Rigby, Harvey, & Bajka, 2016). The role of dietary fibre as a factor diminishing the risk of obesity is also important and evidence from observational studies consistently demonstrates that frequent increased intake of fruits, vegetables and whole grains is associated with lower body weight increase over time. This is so much important that it was observed that adherence to healthier dietary templates (including incorporation of higher amounts of plant-based foods) in intervention studies also tends to evidence greater weight loss when compared to weight control diets (Brownlee et al., s.d.).

Up to the present there have been a number studies that unequivocally demonstrate the health benefits of a fibre rich diet, and this fact has become sufficiently recognized to allow health claims relatively to some types of fibre like for example beta-glucan (Mackie, Bajka, & Rigby, 2016). In fact, nutritional claims for the dietary fibre content of foods are allowed in many parts of the world, including Australia, New Zealand, Canada, Singapore, Europe and United States (Brownlee et al., s.d.).

Because DF has proven many benefits for the human health, its consumption must be encouraged and its effects should be known by the population. Hence, this work aimed at comparing the eating habits regarding food fibres and labelling as well as the knowledge about fibre rich foods and their effects for the wellbeing of the human body. For a wider coverage of the study this was undertaken simultaneously in three countries situated in different parts of the globe, namely South America, Iberian Peninsula and Central Europe, to compare eating patterns, attitudes and level of knowledge about DF.

THEORETICAL FRAMEWORK

Fibre and Diet

The human diets have been changing during the last century, to including increasing amounts of refined grains, meats, added fats and sugars and decreased consumption of vegetable proteins or lower fiber intake (Hall, Baxter, Fryirs, & Johnson, 2010). This pattern is, however, changing again, with new trends to return to healthier lifestyles, including more natural products and increased amounts of fresh fruits and vegetables, refined cereals and less industrialized ready to eat foods. According to the World Health Organization (WHO, 2004), public interest in healthy eating has increased due to the high incidence of several human health disorders, and so there has been an increasing demand for healthy foods (Tudoran, Olsen, & Dopico, 2009).

According to the American Dietetic Association (ADA) people should consume adequate amounts of dietary fiber from a wide variety of plant food sources. In this way, different types of fibers would be ingested together with other bioactive compounds that would act synergistically on the human body to provide health benefits (Macagnan et al., 2016). The effects of fiber consumption vary according to their solubility and chemical structure, and are manifested over appetite regulation, energy intake and body weight. Some dietary fibers are water soluble and therefore have the ability to increase viscosity and reduce the glycemic response as well as the level of cholesterol in the blood stream. On the other hand, in the digestive tract, this type of fiber is related to the ability to retain water and form gels and also constitutes a substrate for fermentation of bacteria in the colon. These characteristics of DF constitute the starting point for their physiological effects (Martinho et al., 2013).

Fibre and Health

The protective role of consumption of fiber-rich foods, including whole grain cereals, fruits and vegetables, on chronic diseases is well documented in the scientific literature.

Reduced bowel function, predominantly constipation, is a frequent complaint of ill or inactive elderly people (Yen, Tseng, Kuo, Lee, & Chen, 2011). On the other hand, gastrointestinal function can also be compromised in children with a variety of disorders (Khoshoo, Sun, & Storm, 2010). Many studies were implemented to assess the effects of various fiber sources in the prevention or treatment of constipation in different patient groups (Taylor, Northstone, Wernimont, & Emmett, 2016).
High-fiber diets, which help to increase stool bulk and moisture and reduce travel time through the gastrointestinal tract. Increasing the amount of fiber in the diet may reduce the symptoms of diverticulosis and prevent complications, owing to the insoluble fiber, especially the cellulose in fruits and vegetables (Feuerstein & Falchuk, 2016).
The term inflammatory bowel disease (IBD) relates to different pathologies of the intestine, namely the Crohn's disease (CD) and ulcerative colitis (UC). CD is a chronic inflammatory bowel disease that can affect any part of the gastrointestinal tract. It usually involves the terminal ileum and proximal colon, and its etiology and pathogenesis is determined by both genetic and environmental factors (Van Loo, Dijkstra, Ploeg, & Nieuwenhuijs, 2012). It has been suggested that increased dietary fiber intake, specifically from fruits, may have a protective effect on development of CD. Also studies have examined the role of dietary factors in UC and how these influence the development of the disease (Jowett et al., 2004), even though the studies about the effect of dietary fiber on UC are not always in agreement.
DF has been associated with a protective role against the development of several types of cancer (Kim & Je, 2016). Scientific studies have investigated specific sources of fiber as having a protective roles on oesophageal cancer (Jessri, Rashidkhani, Hajizadeh, Jessri, & Gotay, 2011; Tang et al., 2013; Wu, Tseng, Hankin, & Bernstein, 2007). In vitro and in vivo studies suggest that dietary fiber may prevent gastric cancer by acting as a nitrite scavenger, potentially countering the carcinogenic effects of N-nitroso compounds (Gonzalez & Riboli, 2010; Zhang, Xu, Ma, Yang, & Liu, 2013). Also colorectal cancer benefit from the ingestion of fiber rich foods.
DF has also proven preventive and effective clinical roles in the management of other disease like cardiovascular diseases, high blood cholesterol or diabetes (Martinho et al., 2013).

1. METHODS

A descriptive cross-sectional study was carried out on a convenience non-probabilistic sample of 1525 participants, by questionnaire survey.

1.1 Instrument

The questionnaire used for this study was prepared by Martinho et al. (2013) who applied it only in Portugal. Then the same questionnaire was used for the present work and applied in different countries. The questionnaire included different sections, formulated to evaluate the attitudes and knowledge regarding foods rich in dietary fibre.
The first section of the questionnaire aimed at getting information about the socio-demographic characteristics, namely age, gender, level of education (primary, secondary or university level) and living environment (urban versus rural).
Another section intended to evaluate the eating habits related to different types of foods and also fibre rich foods. The participants were asked to indicate for a typical week (i.e., not including special occasions like celebrations, holidays, or other occasions in which the diet is not constant) how often they eat certain foods using an open-ended question format. The questions asked about eating legumes and/or salads, eating fruit, eating whole cereals, eating out of home or eating fast-food.
A different part of the questionnaire was about the attitudes toward food labelling and particularly about the contents and information regarding fibres. These questions were answered on a 5-point scale, varying from 1 (never) to 5 (always).
The sources of information about dietary fibre and its role in maintaining a healthy body were also investigated in the questionnaire, and in this case a set of dissemination means were gives and the respondents were asked to rate them from the least to the most important.
The knowledge about the relation between dietary fibre and foods was evaluated through another group of questions where the participants were asked to state their accordance measured on a 5-point Likert agreement-scale ranging from 1 (totally disagree) to 5 (totally agree). The same Likert scale was also used to evaluate a set of questions related to the knowledge about the health benefits of a recommended ingestion of dietary fibre.

1.2 Data collection

In each country the sample was selected attempting to reach different sectors of the population, namely in terms of age, literacy, gender or geographical area of residence, including people from different cities and smaller villages in each of the participating countries.

The participation in the survey was voluntary, and the questionnaire was applied by direct interview only to adult citizens, after verbal informed consent was obtained. The questionnaire followed all necessary ethical evaluation steps prior to its application. Furthermore, all the answers were anonymous and no personal data were ever collected or related to any answers, so as to protect the participants.

1.3 Statistical analysis

The exploratory analysis of the data was made by basic descriptive statistics using the software SPSS, from IBM Inc. (version 23).

1.4 Sample Characterization

This study was undertaken in 2015 in three countries situated in different regions of the globe: Portugal, in the Iberian Peninsula, Argentina, in South America, and Hungary, in Central Europe. The total number of participants was 1525 divided as: 847 in Argentina, 296 in Hungary and 382 in Portugal.

The distribution by gender indicated that the majority of the enquired were women, 70.3% (1072 female against 447 male individuals), with 6 participants not indicating their gender.

The enquired were all adults, ranging in age from 18 to 84 years. The variable age was classified into categories as follows: young adults, from 18 to 30 years, accounting for 47.9%; average adults, from 31 to 50 years, representing 35.9%; senior adults, from 51 to 65 years, corresponding to 11.8%; and finally elderly, from 51 to 65 years, corresponding to 4.4%.

The majority of the participants had a high level of education (58.7% with a university degree), while 38.1% had competed secondary school and a minor percentage (3.2%) had completed the lowest level of education (primary school). Four participants did not indicate their level of education.

The great majority of the participants lived in urban areas (91.3%), contrarily to 8.7% who lived in rural areas.

2. RESULTS AND DISCUSSION

2.1. Eating Habits

Table 1 shows the results relatively to the frequency of consumption of certain types of food and/or feeding habits such as eating out of home or eating fast food meals.

Table 1 – Eating habits of the participants

Weekly frequency	Argentina			Portugal			Hungary		
	Min	Max	Mode	Min	Max	Mode	Min	Max	Mode
Vegetables and/or salads	0	28	**14**	0	35	**10**	0	30	**7**
Pieces of fruit	0	35	**7**	0	50	**14**	0	55	**5**
Whole grains	0	7	**0**	0	21	**0**	0	20	**0**
Eat outside from home	0	15	**1**	0	36	**5**	0	20	**5**
Eat fast food	0	10	**0**	0	10	**0**	0	5	**0**

The values in Table 1 show that there is a great variability in the habits of the participants as to the number of meals in which they include vegetables and/or salads, varying from zero to around 30 in the three countries. Regarding the most frequent answer, mode, it was 14 in Argentina, corresponding to two meals per day with vegetables and/or salads, while in Portugal that consumption tends to be lower, 10 times which corresponds to little over once a day, and in Hungary the scenario is not ideal also, with a consumption of only one meal per day with vegetables and/or salads. To refer that in Hungary the data collection occurred in the autumn-winter time, when the availability of fresh vegetables, and mainly fruits, is somewhat limited. In what concerns the frequency of consumption of fruit, the trends are slightly different in the three countries analysed. In Argentina the maximum number of fruit pieces (or doses) is lower when compared to Portugal or Hungary, although the minimum is in all cases zero, which is preoccupying, given the importance of fruits in the diet. It is well known that vegetables and fruits are much important in the diet, not only because they are the source of DF, but also because they provide vitamins, minerals and many bioactive compounds like phenolic compounds with antioxidant activity (Bhatt, Rawat, Badhani, & Rawal, 2017; Ozkan, Ucar,

Yildiz, & Ozturk, 2016; Vargas-Murga, de Rosso, Mercadante, & Olmedilla-Alonso, 2016). As to the most frequent answer, it was 7 in Argentina, thus meaning the consumption of fruit only once a day, while in Portugal that doubles to 14, i.e., twice a day. On the other hand, the consumption of fruit in Hungary tends to be lower than once per day: 5 times per week.

When it comes to the consumption of whole grains the perspective is not satisfactory at all, since in the three countries evaluated the majority of the participants in the study admitted that they do not eat whole grain foods (mode zero in all cases). Cereal grain kernels are constituted by endosperm, bran, and germ. However, the vast majority of cereal products are traditionally prepared from refined flour after removal of bran and germ, which are the two parts of grain kernels containing most of the dietary fibre and other bioactive components. Hence, when compared to refined grains, most whole grains provide more protein, fibre, and other nutrients, including minerals (calcium, magnesium, and potassium) as well as many phytochemicals (Geng, Harnly, & Chen, 2016).

In regards with the habit of eating out of home, the most frequent answers vary from 1 in Argentina to 5 in Portugal and Hungary. This may indicate that in Argentina people still have the chance to eat at home both at lunch and dinner, and therefore they go to eat out in a restaurant perhaps only once in the weekend. On the contrary, in Portugal and Hungary it might be that the 5 times people eat out of home correspond to the 5 working days of the week, in which case people who work do not have the possibility to go home for lunch.

Regarding the number of times the participants eat fast food meals the result are very encouraging, because the most frequent answer is zero in all countries of the study, thus indicating that people are alert to the lower nutritional quality of those known as fast food meals, associated with high caloric value, high refined carbohydrates, high fat content, particularly in saturated fats, and low amounts of more beneficial nutrients, such as vitamins, fibre or phytochemicals (Lee & Thompson, 2016; Namin, 2017).

2.2. Information Sources

The importance of the different possible sources of information about healthy eating and dietary fibre in particular was investigated also in this study and the results are shown in Table 2.

Table 2 – Sources of information about dietary fibre

Media	Order of importance		
	Argentina	**Portugal**	**Hungary**
Health centres and hospitals	3rd	5th	4th
Radio	**6th**	**6th**	**6th**
Television	4th	3rd	3rd
School	5th	2nd	5th
Magazines books	2nd	**1st**	2nd
Internet	**1st**	4th	**1st**

The participants were asked to rate from the more important (1st) to the least important (6th) the following means of dissemination of information: health centres and hospitals, radio, television, school, magazines books or internet. The results evidences that internet is the first choice in Argentina and in Hungary to look for information about dietary fibre and fibre rich foods, followed by magazines and books, being this source the 1st choice for the Portuguese participants. In fact, we must not forget that internet is widely and easily accessible and people rely on the information found on the internet. Nevertheless, the contents of the webpages are not always certified as correct and this means that some work has to be done as to educate people about the consultation of webpages from governmental and official agencies instead of pages from private owners whose reliability is not fully guaranteed. Health centres and Hospitals come in 3rd, 4th and 5th place respectively for Argentina, Hungary and Portugal, which means that still much should be done so as to use these privileged places as sources of dissemination of information about healthy eating habits together with other health information.

Radio has lost its importance perhaps over the last decades due to the rising of more convenient social media as a vehicle for the information about diverse subjects, and particular healthy eating tips. This was evident from the results of this study, since radio came in last for the three countries at study.

2.3. Knowledge about Food Fibres

Table 3 shows the results relative to the knowledge about sources of DF and fibre rich foods in the three countries.

Table 3 – Knowledge about fibres and foods

Statement about fibres & foods[1]	Argentina					Portugal					Hungary				
	Score[2]					Score[2]					Score[2]				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
FF1	31	36	11	17	5	14	31	13	23	19	28	22	13	23	14
FF2	8	22	21	33	16	9	23	18	31	19	23	23	14	23	17
FF3	2	4	44	36	14	2	6	55	28	9	4	6	35	39	16
FF4	29	34	23	11	3	44	31	13	8	4	45	21	16	10	8
FF5	28	34	23	12	3	48	31	13	6	2	45	20	10	16	9
FF6	2	4	18	44	32	1	4	11	47	37	1	4	11	30	54
FF7	10	17	25	38	10	17	24	16	35	8	13	16	19	29	23

[1] FF1 = Only plant foods have fibre;FF2 = Foods of animal origin such as meat, eggs and dairy products do not contain fibres (unless added); FF3 = According to the World Health Organization, the average adult should eat 25g of fibre per day; FF4 = Whole foods have less fibre when compared to non-whole foods; FF5 = The unpeeled fruits have less fibre than peeled ones; FF6 = Legumes (peas, beans ...), cereals and fruits are foods that are very rich in dietary fibre; FF7 = Dietary fibres have calories, and so they provide energy to the organism when ingested.

[2] Score scale: 1 = Strongly disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; 5 = Strongly agree

In relation to the plant origin of DF (statement FF1), in Argentina 67% of the participants were not aware of this fact (disagree or strongly disagree) and only 22% showed knowledge about this (agree or strongly agree), while in Portugal and Hungary the participants who knew this were 42% and 37%, respectively. In a similar study previously conducted only in Portugal (Martinho et al., 2013), 36% agreed that the statement was true, thus being in relative agreement with the results found in this study also for Portugal. When asked if animal foods did not have DF, the participants showed a mild agreement (49% in Argentina, 50% in Portugal and 40% in Hungary). In the study by Martinho et al. (2013), the percentage of agreement was 42%, thus confirming the trend observed in the present study.

Regarding the dietary fibre recommendations, the exact amounts vary according to the agency and also according to the person, namely in terms of age or gender. Differences may be encountered between the recommendations relative to dietary fibre consumption around the world worldwide. Nevertheless, the World Health Organization (WHO) recommends a daily average of 25g of fibre for adults (WHO, 2003). The knowledge about this recommendation was not satisfactory, and in the three countries the majority of the participants did not even have an opinion (44%, 55% and 35%, respectively for Argentina, Portugal and Hungary).

When asked about the fibre content in whole foods, the majority disagreed that whole foods have less fibre (63%, 75% and 66%, for Argentina, Portugal and Hungary), so they demonstrated knowledge about the whole foods being richer in fibre. In the study by Martinho et al. (2013) also 67% of the enquired were aware that the whole foods have more fibres than the non-integral counterparts.

The peel of certain fruits is edible, like in apples or pears, and in that case added benefits come their consumption together with the fruit because they possess a high fibre content as well as a high concentration of phenolic compounds (Guiné et al., 2010). When asked about this fact, the participants demonstrated a fairly good level of knowledge for all countries (62%, 79% and 66% respectively for Argentina, Portugal and Hungary).

It is well established that legumes, vegetables, cereals and fruits are foods with a high content in DF, and this was also verified in the present work, since for all countries the agreement was very significant 76% for Argentina and 84% for both Portugal and Hungary. In the study by Martinho et al. (2013) in general the respondents agreed that these foods are rich in fibre, with 46% if favour of the statement and 31% strongly in favour, giving a total of 77% agreement.

For many years it was believed that DF did not provide calories when ingested but this was changed relatively recently so that presently it is assumed that 1 gram of DF corresponds to 2 kcal (8 kJ) (DL-54, 2010). Although, this is recent, the general

population already is aware of it, as shown by the results of this study: 48%, 43% and 52 % in Argentina, Portugal and Hungary, respectively.
When the three countries are compared in relation to the knowledge about several aspects related to DF, no substantial differences arise, thus showing that although located in different parts of the world map, the realities are quite similar in those countries.

2.4. Knowledge about Health Benefits of Food Fibres
Table 4 shows the results obtained for the questions related to the health effects of dietary fibre.

Table 4 – Knowledge about the health benefits of consumption of food fibres

Statement about fibres & health[1]	Argentina					Portugal					Hungary				
	Score[2]					Score[2]					Score[2]				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
FH1	1	6	23	45	25	1	4	22	49	24	2	6	22	45	25
FH2	1	3	18	50	28	0	3	22	51	24	2	6	23	42	27
FH3	2	5	28	39	26	1	3	19	45	32	1	7	20	32	40
FH4	1	4	20	49	26	0	2	15	55	28	1	6	20	35	38
FH5	2	4	15	38	41	1	1	6	42	50	2	4	10	23	61
FH6	3	8	35	35	19	2	8	40	38	12	4	12	27	35	22

[1] FH1 = Fibres can prevent and/or treat cardio-vascular diseases;FH2 = Fibres can prevent and/or treat cholesterol; FH3 = Fibres can prevent and/or treat bowel cancer; FH4 = Fibres can prevent and/or treat obesity; FH5 = Fibres can prevent and/or treat constipation; FH6 = Fibres can prevent and/or treat diabetes.
[2] Score scale: 1 = Strongly disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; 5 = Strongly agree

Regarding the cardiovascular diseases, it was found that the majority of the participants were knowledgeable of this effect, 70%, 73% and 70% for Argentina, Portugal and Hungary, respectively, corresponding to the participants who agreed or strongly agreed with the statement. Nevertheless, a still important part did not have an opinion about this, 22-23%, which is significant. In the previous study by Martinho et al. (2013), the agreement was 71%, which is about the same value of those in the present work for the three countries at study.
Regarding the benefits of DF to lowering the blood cholesterol, the results are also encouraging, with 78%, 75% and 69% of expressed agreement, respectively for Argentina, Portugal and Hungary, which indicate that people know about the role of DF in fighting the hypercholesterolemia, as was already observed previously in a similar study applied only in Portugal (Martinho et al., 2013).
The knowledge about the effect of DF in intestinal cancer was also investigated and the results show that 65% to 77% of the participants know this role of DF, depending on the country. Still, some important part of the participants did not reveal an opinion: 19% to 28%, thus indicating that this might be an area where more information should be provided.
The benefits of a fibre rich diet to treat and prevent constipation are well known to the great majority of the participants, 79% for Argentina, 92% for Portugal and 84% for Hungary. This is clearly the most well-known among the general population of the effects of DF, as already evidenced in the study by Martinho et al. (2013).
DF has also an important role in the management of diabetes, helping balancing blood sugar levels. However, this fact is not so well known to a considerable part of the enquired, with 27% to 40% not manifesting any opinion about the subject. Still, from those who responded to the question the majority were in favour: 54%, 50% and 57%, respectively for Argentina, Portugal and Hungary.
Again, the results were quite homogeneous when comparing the different countries at study.

2.5. Fibres and Food Labelling
Food labels constitute a most important way of knowing what one eats and how to supply the body with the necessary nutrient requirements. Hence, the attitudes towards food labelling are of the utmost importance and they were evaluated in this study.

When the participants were asked if when they buy a food product they usually consult the label information, the trends are variable, with about 37% to 60% confirming that they do it frequently; against 14% to 32% who admit they do not (Table 5).

Table 5 – Attitudes regarding food labels and nutritional information about fibre

Statement about fibres & labelling[1]	Argentina					Portugal					Hungary				
	Score[2]					Score[2]					Score[2]				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
FL1	18	14	31	20	17	2	12	31	41	14	4	13	23	36	24
FL2	20	14	28	20	18	5	14	31	36	14	7	21	31	27	14
FL3	42	24	22	7	5	12	28	33	20	7	31	30	25	11	3
FL4	40	21	24	10	5	11	23	36	25	5	38	26	20	10	6
FL5	48	18	16	10	8	13	28	29	20	10	34	21	21	17	7

[1] FL1 = When buying a food product I usually consult the label information;FL2 = On the label, I usually consult the nutritional information; FL3 = In the nutritional label of any food I usually check how much fibre it possesses; FL4 = The amount of fibres is a factor to be taken into account in the choice of similar foods; FL5 = If I buy a food product where the packaging refers to "high fibre" or "high in fibre", I check the label for the amount of fibre it has.
[2] Score scale: 1 = Never; 2 = Rarely; 3 = Sometimes; 4 = Many times; 5 = Always

Also 23% to 32% replied that they consult the label sometimes when buying foods. The nutritional information contained on the label is read frequently by an important part of the participants: 38% for Argentina, 50% for Portugal and 41% for Hungary, while 28% to 31% see the nutritional information only sometimes. The information about the fibre content of foods does not seem to attract so much attention from people, so that those who consult this frequently or always are only 12% for Argentina, 27% for Portugal and 14% for Hungary. The contend in DF also does not seem to constitute a factor that clearly influences people's food choices, with 34% to 64% admitting that they never choose food based on the fibre content. Finally, relatively to the confirmation of fibre rich allegations, most people also do not really seem to care about this, with 41% to 66% expressing they seldom or never verify if the contents in fibre supports the allegation.
Finally, comparing the attitudes of the population in the different countries, again no important differences seem to arise, and regardless of the country people still do not care much about the food labelling.

3. IMPLICATIONS AND LIMITATIONS

Some limitations of this work relate to the unequal number of questionnaires answered in each of the countries, being the number in Argentina almost 3 times that of Hungary, which might create some assimetries when the data are treated as a whole. One interesting aspect of this research is to compare different parts of the globe, namely Latin America, Iberian Peninsula and Central Europe. However, that also poses some difficulties, because the cultural realities in these countries are evidently different. Hence, an interesting challenge might be to try to investigate how the results of this research could be linked to social, cultural or even educational variables in those countries. Another aspect possible to investigate as a continuation of this study might be to apply the same questionnaire to some target groups and evaluate if differences would be observed. Some of those target groups could be for example people with some food restrictions or allergies, people with some chronic diseases, people with professional activities related to health, food or sports, among others.

CONCLUSIONS

This work allowed comparing three countries in relation to the habits, attitudes and knowledge about DF. The results showed that the eating patterns differ slightly in relation to the ingestion of vegetables, salads and fruits, but not in relation to the ingestion of whole cereals. These differences can be related to the availability and traditional diets in each of the countries at study, particularly in what concerns the ingestion of plant foods. Still, in all cases the ingestion is below the recommended dosages so as to get benefits from the ingestion of these types of food.

Regarding the eating outside of home differences were encountered so that while in Argentina most frequently people eat out only once a week, while in Portugal and Hungary the trend is towards eating out 5 times a week, maybe coincident with the 5 working days.

With respect to the sources of information about DF and healthy eating recommendations, internet was recognized as a very important source, maybe due to the high rate of young adults in the sample (~50%), particularly in Argentina and Hungary, with hospitals and health centres having a minor role, which should perhaps be a subject for further analysis and planning of educational actions.

In general, the respondents showed a moderate level of knowledge about the nature and sources of DF but a better knowledge about its effects on human health, being this similar among the countries at study.

However, in what concerns the attitudes towards food labelling it was observed a generalized lack of interest about the label information and the fibre contents in particular.

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USO DE PRODUTOS FITOFARMACÊUTICOS NA AGRICULTURA

USE OF PLANT PROTECTION PRODUCTS IN AGRICULTURE

USO DE PRODUCTOS FITOSANITARIOS EN LA AGRICULTURA

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RESUMO

Introdução: A agricultura é uma atividade praticada há milhares de anos por seres humanos para a produção de alimentos que representam riscos para a saúde dos trabalhadores. Estes riscos estão presentes, principalmente, devido à utilização de produtos fitofarmacêuticos (PPP) que apesar de ter benefícios na obtenção de alimentos também apresentar inconvenientes para os seus manipuladores e também para o meio ambiente.

Objectivos: Avaliar os conhecimentos sobre a utilização e aplicação de produtos fitofarmacêuticos na agricultura.

Métodos: Estudo exploratório realizado em várias empresas no sector agrícola no norte e centro de Portugal e teve como população-alvo todos os trabalhadores que usaram PPP em suas funções de trabalho para um total de 46 funcionários a quem foram aplicados questionários para recolher informação sobre as práticas adotadas pelos trabalhadores no que diz respeito à utilização de trabalho de PPP. A investigação durou oito meses, com início em outubro de 2015 e terminou em maio de 2016.

Resultados: A aplicação desta pesquisa mostrou as boas práticas adotadas pelos trabalhadores que foram questionados, designadamente: leitura dos rótulos; uso de equipamentos para a segurança individual e alocação/triagem correta dos resíduos de embalagens vazias de PPP. No entanto apurou-se existirem aspectos em que os trabalhadores poderão melhorar, tais como: nível de consciência sobre o risco a que estão expostos ao manusear PPP já que nem todos os trabalhadores adotaram boas práticas agrícolas.

Conclusões: Os resultados sugerem a necessidade de novas acções pelos órgãos de supervisão para garantir que os aplicadores de PPP adquirem as certificações e formação exigidas por lei. Também devem ser criadas mais campanhas de sensibilização sobre as questões de segurança salientando-se a importância da leitura dos rótulos, uso de equipamento adequado para a segurança individual face à exposição para cada tipo de produto e assegurar a devida rota para o pacote de resíduos.

Palavras-chave: Produtos fitofarmacêuticos, Exposição, Saúde, Risco,

ABSTRACT

Introduction: Agriculture is an activity practiced for thousands of years by humans for food production representing risks to the workers' health. These risks are present mainly due to the use of Plant Protection Products (PPP) that despite having benefits in getting food also entail disadvantages for their handlers, to consumers of food produced and also for the environment me to carry out an empirical evaluation of the use of PPP in agriculture.

Objectives: Assess knowledge about the use and application of plant protection products in agriculture.

Methods: Study exploratory was conducted in several companies in the agricultural sector in the north and centre of Portugal. As the target population were considered all workers who used PF in their work duties for a total of 46 employees to whom questionnaires were administered to collect information on the practices adopted by the workers as regards the labour use of PPP. The investigation lasted eight months, starting in October 2015 and ending in May 2016.

Results: The application of this research has shown the good practices adopted by the workers who were questioned and which are reading the labels, use of equipment for individual safety and proceed the correct disposal of waste of empty containers of PPP. However it can be noted that there are still aspects that the workers have to improve awareness level about the risk they are exposed to when handling PPP since not all employees were careful to adopt these good agricultural practices.

Conclusions: The results also demonstrate the need for further action by the supervisory bodies to ensure that the PPP applicators have all the required training certificate by law. It should also be created more awareness campaigns about the safety issues when these products are used like the importance of reading labels, use of appropriate equipment for individual safety for each product type and exposure, and properly route for the waste package.

Keywords: *Plant Protection Products; Exposure; Health Risk; Equipment for individual safet; Residues;*

RESUMEN

Introducción: La agricultura es una actividad practicada desde hace miles de años por los seres humanos para la producción de alimentos que representan riesgos para la salud de los trabajadores. Estos riesgos están presente debido principalmente a la utilización de los productos fitosanitarios (PPP) que apesar de tener beneficios en la obtención de alimentos también implica desventajas para sus manipuladores y también para el medio ambiente.

Objectivos: Avaliar los conocimientos sobre la aplicación y los productos fitofarmacéuticos en la agricultura.

Métodos: Estudio exploratorio desarrollado en varias empresas en el sector agrícola en el norte y centro de Portugal. A medida que la población objetivo se consideraron todos los trabajadores que utilizan PF en sus tareas de trabajo para un total de 46 empleados a los cuales se administraron cuestionarios para recopilar información sobre las prácticas adoptadas por los trabajadores en cuanto a la utilización del trabajo de PPP. La investigación duró ocho meses, a partir de octubre 2015 y finalizó en mayo de 2016.

Resultados: La aplicación de esta investigación ha puesto de manifiesto las buenas prácticas adoptadas por los trabajadores que fueron interrogados, y que están leyendo las etiquetas, el uso de equipos de protección individual y proceder a la eliminación correcta de los residuos de envases vacíos de productos fitosanitarios. Sin embargo cabe señalar que todavía hay aspectos que los trabajadores tienen que mejorar como el nivel de conciencia sobre el riesgo que están expuestos a la manipulación de PPP ya que no todos los empleados fueron muy cuidadosos para adoptar estas buenas prácticas agrícolas.

Conclusións: Los resultados también demuestran la necesidad de nuevas medidas por los órganos de control para garantizar que los aplicadores de APP tienen todo el certificado de formación requerida por la ley. También se debe crear más campañas de concienciación sobre los problemas de seguridad cuando estos productos se utilizan como la importancia de las etiquetas de lectura, uso de equipo adecuado para la seguridad individual para cada tipo de producto y la exposición, y encaminar adecuadamente para el paquete de residuos

Palabras Clave: Protección de Plantas y Productos, Exposición, Salud, Riesgos,

INTRODUCTION

Agriculture is an activity that has been practiced for thousands of years by humans for food production (Paiva, 2010). Today, it rises up with the need to increase production in order to suppress the growing demand for food (Rico, 2013) resulting from a population increase (Paiva, 2010) challenging the workers of this sector to do so with the same area agricultural (European Landowner's Organization & European Crop Protection, 2015). The production of food products is realized by agricultural enterprises (Medina, s.d.) by using a monoculture agriculture (Costa & Teixeira, 2012). observe their crops being threatened by enemies as pests, diseases and weeds that compromise the crops (Medina, s.d.); (Costa & Teixeira, 2012). So these companies generally use processes that protect the seed and harvesting through treatments in cultures performed especially by the application of PPP (Rico, 2013)finding its use necessary to obtain large yields of food (Medina, s.d.) thereby practicing intensive farming with goal of increased productivity (Paiva, 2010) and improving the quality of agricultural products (Barbosa, 2012).

The use of such products has been found throughout the history of agriculture, but the first milestone of its use was discovered in the mid-30s of the nineteenth century during the development of new chemicals (Barbosa, 2012) having its use increased progressively over the years (Guerra, 2012). The name given to these products change through the years, PPP is the name given by the national legislation (Guerra, 2012); (Lei n.º 26/2013, de 11 de abril). PPP are substances or mixtures of substances designed to combat, control and prevent harmful organisms of agricultural crops such as weeds, diseases and pests (European Landowner's Organization European Crop Protection [ELOECP], 2015); (Rico, 2013); (Rodrigues, Sá, & Moura, s.d.); (Garrido, 2000); (Instituto Nacional de Estatística [INE], 2014); (Direção-Geral de Alimentação e Veterinária [DGAV], 2013a); (Silva, 2012) that can interfere in the production, storage, transport, distribution and processing of agricultural products (Barbosa, 2012). These are characterized by being more or less toxic and in a short and long term can be harmful when introduced into the environment (Garrido, 2000); (Guerra, 2012). PPP enable the production of large quantities of food in order to fulfill the needs of the world population (Medina, s.d.), and have other benefits such as destroying or preventing the action of pests on food products (Teixeira, 2014) avoiding or minimizing losses of crops, helping plantations to develop their full potential, improving the quality of agricultural products (Guerra, 2012) and preserving food after harvesting (Teixeira, 2014). Consequently, these benefits lead to other positive effects as it maintains regularized productions (Guerra, 2012); (Teixeira, 2014) ensuring a continuous supply to the sales areas, allowing the minimization of hand labor requirements over the plantation growth and allowing employability in various sectors that are associated with the production of these products such as pharmaceuticals, transportation companies, among others (Guerra, 2012). However, associated with the use of PPP are also disadvantages as its use raises risks (Medina,s.d.); (Guerra, 2012) dependent on the product toxicity causing acute disease (Costa & Teixeira, 2012), and chronic, production of PPP waste on the environment, persistence and bioaccumulation on the food chain and resistance to PPP in some organisms (Guerra, 2012). With the wide use of PPP it began to emerge alarm signals regarding its toxic nature (Costa & Teixeira, 2012). having thus been initiated efforts to develop new less aggressive compounds to humans and the environment (Barbosa, 2012). The risk that such products have for the environment depend on various factors such as their physical and chemical properties, amount of product applied, method and time of application and the degree of toxicity (Garrido, 2000). The negligent use, the fact that such products degrade slowly and

their mean of dispersion which lead them to be considered as a problem for public health and the environment because of its waste being responsible for adverse effects (Barbosa, 2012); DGAV, 2013b), and often identified in water, soil and food products (Garrido, 2000); (Guerra, 2012); (Medina, s.d.), causing serious health problems in humans when acting on vital system (Costa & Teixeira, 2012); (Barbosa, 2012). So during the use and application of these products the risks should be considered (Calado, 2006).
In order to have a production, marketing and responsible use of PPP exists legislation regulating the various stages in the life cycle of such products (Cruz, 2006). The use of PPP is subject to approved legislation after running several tests to these compounds (Rico, 2013) carried out by experts with the aim of finding effective products which are not harmful to humans or the environment (Medina, s.d.), also confirming that any waste remain in the environment and agricultural products after use, do not represent risks to consumers (European Crop Protection [ECP], 2014). The European Union therefore stipulates increasingly stricter legislation (Guerra, 2012) designed to ensure that PPP are effective, safe and suitable for use not causing harmful effects (ELOECP, 2015).
Towards the high consumption of PPP, exists in Portugal, the concern to limit the use of these products (Garrido, 2000) thereby using other means of control as the cultural, biological, genetic and biotechnical (Barbosa, 2012) continuing to optimize its benefits and reducing the negative effects through legislation that is continuously adjusted (Garrido, 2000). A measure to reduce the incorrect use of PPP in Portugal, it is the obligation for all applicators of these products having a training certificate (Guerra, 2012) from 26 November 2015 (Lei n.º 26/2013, de 11 de abril, 2013).
In Portugal, the number of deaths due to intoxication with PPP is considerable. The intoxications by PPP, are thereby recognized as a significant public health problem (Rodrigues et al., s.d.). The risk of intoxication by a PPP, depends on characteristics such as the toxicity of the active substance, exposure time, the way this product enters the body (Teixeira, 2014) and handling and application use in case its incorrect and careless (Guerra, 2012). This type of intoxication can be acute when they occur immediately after the absorption of substances in an amount sufficient to induce symptoms, chronic when expressed after a more or less prolonged period of exposure to the product (Teixeira, 2014); (Guerra, 2012), or allergenic reactions which can produce symptoms of pathologies such as nausea, headache, seizures and skin irritation for example (Teixeira, 2014).
Although PPP have been modified to make them less aggressive, none is harmless (Guerra, 2012). The PPP, as previously mentioned, have substances that can be harmful to human health, animal health and the environment (Rico, 2013), it is important the fulfil and develop strategies to a better use of these substances and to minimize the risks for the environment and public health (Garrido, 2000) as well as to workers who use these products or manipulate during transport and storage (Teixeira, 2014). Various workers who manipulate these products may be exposed in various ways (Rodrigues et al., s.d.). The entry of the PPP in the body can be made in oral, inhalation or dermal route (Teixeira, 2014); (Garrido, 2000) being the last one the most common entry path (Costa & Teixeira, 2012); (Guerra, 2012).
In agriculture as in any other sector of activity, workers must receive the necessary information so that, based on it, they can make decisions about how to act (Costa & Teixeira, 2012); (Guerra, 2012). For a correct use of these products, the worker must correctly identify the problem to combat so that it can select the best PPP to apply and the application form, dosage and frequency (Teixeira, 2014); (Guerra, 2012); (Garrido, 2000).
The label is an important element for the characterization of a PPP this, in it are presented the results of investigations carried out to verify the efficiency and dangerousness of these products (Guerra, 2012). So the labels instruct PPP users by describing the following procedures for a safe use and the risks inherent in their incorrect use both for health and for the environment so therefore is crucial to compliance with the points expressed in it to promote the production but also to satisfy the criteria of safety and food quality (Guerra, 2012); (ANIPLA, Crop Protection. s.d.) being mandatory to follow his direciones (Associação Nacional da Indústria para a Protecção de Plantas, 2005).
With the use of a PPP its harmfulness is always present and it is necessary to reduce the employee exposure level to prevent it from being contaminated (Guerra, 2012). The protection of workers using these products should be thereby ensured by the use of appropriate Personal Protective Equipment (PPE) (Costa & Teixeira, 2012); (Teixeira, 2014) not only during the mix to apply but throughout the all handling of the PPP (Guerra, 2012). For a correct use PPE the user should pay attention to the information provided on the product label that will apply as well as the conditions of use and maintenance of these equipment so that they are always in good conditions of use (Teixeira, 2014); (Guerra, 2012).
The protection of crops against their threats is a complex problem considering the diversity of harmful organisms as well as the large amount of PPP available on the market (Guerra, 2012) products that continue to be the resource most used for its effectiveness in eliminating the cultures threats and as a guarantee of obtaining profits in this activity (Costa & Teixeira, 2012). This research study aimed to do an empirical analysis of the use of plant protection products in the agricultural sector the choice of this theme is due to the importance of global production with the use of these products by looking for food at a pace higher than the offer.

1. METHODS

Study exploratory was conducted in several companies in the agricultural sector in the north and centre of Portugal. As the target population were considered all workers who used PF in their work duties for a total of 46 employees to whom questionnaires were administered to collect information on the practices adopted by the workers as regards the labour use of PPP. The investigation lasted eight months, starting in October 2015 and ending in May 2016.

The questionnaires were designed seeking to answer important questions concerning the use of PPP in agriculture being distributed in agriculture companies of North and Centre of Portugal who used these products. The questionnaire initially was focused on the description of the socio-biographic data of the participants, being then developed four pieces that identified whether the PPP applicators obtained or not training on the application of these products, the importance of the label given by the workers who manipulate these products, knowledge of PPE and its use and also the destination of the empty containers of PF. It should also be noted that, with the approval of questionnaires in the agricultural enterprises the data collected showed only purely curricular and academic interest having no economic or commercial interests. All questionnaires were also carried out so that the anonymity of all workers who participated in the study was maintained and the confidentiality of the data collected was assured.

1.1 Sample

This investigation had the duration of 8 months between October 2015 and May 2016. The study was conducted in several companies in the agricultural sector in Northern and Central of Portugal Continental area and had the aim to conduct an empirical assessment of the use of PPP in agriculture. As the target population were considered all workers that used these compounds in their work duties for a total of 46 workers questioned. It was performed an observational study of level II cross-sectional cohort. The data collection was carried out by questionnaires in order to collect information on workers' practices regarding the use of plant protection products in work. In the appendix is presented a copy of the questionnaire used to obtain data and a copy of the application used in the approach to agricultural enterprises.

1.2 Data Collection Instruments

For the analysis of data obtained in the development of this research it was used the data processing and statistical analysis software identified by name IBMSPSS statistics version 23.0. For data processing it was used the nonparametric tests: Fisher's exact test and chi-square test of independence. For statistical inference it was used a 95% confidence level for a random error less than or equal to 5%.

2. RESULTS

After the application of the questionnaires in the companies of agricultural sector in the North and Centre of the country it was preceded the analysis of the responses obtained in the same obtaining therefore the results presented below.

As it can be seen in Tables 1 and 2q presented in the appendix out of the 46 questionnaires it was found that only 22 subjects had training on application of PPP being 23 subjects' full-time workers in the agricultural sector and 23 part-time workers in this sector.

It was proposed to assess the relationship between the presence or absence of care to read the label of a PPP before an application and if this type of care would be related to the presence of previously received training on the use of this products. Consider the following table1.

Table 1: Relation between Reading the label f PPP and Training on the use of PPP

			Training on the use of PPP		Total
			Yes	No	(%column)
Read the label of PPP	Yes	n	21	19	40
		% line	52,5%	47,5%	
		% column	95,5%	79,2%	87,0%
	No	n	1	5	6
		% line	16,7%	83,3%	
		% column	4,5%	20,8%	13,0%
Total		N	22	24	46
		% line	47,8%	52,2%	100,0%
		% column	100,0%	100,0%	100,0%

Fisher's exact test (p=0,114)

According to the table above, it has not been identified a pattern of association between the practice of reading or not the label of a PPP before the application and the presence/absence of training on the use of this type of products (p>0.05). Nevertheless, people who indicated having the habit of reading the label of a PPP (n= 40) the most indicated having received training (52.5%). However, the total number of people who indicated not having the care to read the label of the product before application (n=6), most of them never received any training on the use of PPP (83.3%). It can also be added that in the study the prevalence of people with training on application of the products was 47.8% compared to the total study sample (N=46).
Afterwards it was proposed to assess the relationship between the presence or absence of knowing what are PPE and if this kind of knowledge would be related to the presence of previously received training on the use of PF. Consider the following table2.

Table 2: Relation between Information about PPE and Training on the use of PPP

			Training on the use of PPP		Total
			Yes	No	(%column)
Information about PPE	Yes	n	22	19	41
		% line	53,7%	46,3%	
		% column	100,0%	82,6%	91,1%
	No	n	0	4	4
		% line	0,0%	100,0%	
		% column	0,0%	17,4%	8,9%
Total		n	22	24	45
		% line	48,9%	52,1%	100,0%
		% column	100,0%	100,0%	100,0%

Fisher's exact test (p=0,059)

According to the table above, it has not been a pattern of association between information of PPE and the presence/absence of training on the use of PPP (p>0.05). Nevertheless, people who indicated having the information of PPE (n=41) mostly indicated having already received training (53.7%). However, the total number of people who indicated total ignorance about PPE (n=4), none had received any training on the use of FP (100%).
Later it was proposed to evaluation the relationship between the presence or absence of information of PPE and knowledge of the various types of PPE in agricultural activities. Consider the following table3.

Table 3: Relation between Information of PPE and Knowledge of PPE presented in the questionnaire

			Knowledge of PPE		Total
			Yes	No	(%column)
Information about PPE	Yes	n	22	19	41
		% line	53,7%	46,3%	
		% column	100,0%	79,2%	89,1%
	No	n	0	5	5
		% line	0,0%	100,0%	
		% column	0,0%	20,8%	10,9%
Total		n	22	24	46
		% line	47,8%	52,2%	100,0%
		% column	100,0%	100,0%	100,0%

Fisher's exact test (p=0,031)

According to the table above, there was a pattern of association between information about PPE and knowing the PPE presented in the questionnaire (p<0.05). People who reported having information on EPI (n=41) most of them indicated being aware of all PPE presented in the questionnaire (53.7%). Of the total number of people who indicated not knowing what PPE are (n=5), none has knowledge of PPE indicated in the questionnaire (100%).
Afterwards it was set out to assess the relationship between the presence or absence of appropriate practices on the use of PPE when using PF, that is, if people use PPE in the three situations presented in the questionnaire and if this type of care would be related the presence of previously received training on the use of such products. Consider the following table 4.

Table 4: Relation between Appropriate practices on the use of PPE and Training on the use of PPP

			Training on the use of PPP		Total
			Yes	No	(%colunm)
Appropriate practice about PPE	Incorrect	n	11	17	28
		% line	39,3%	60,7%	
		% column	50,0%	70,8%	60,9%
	Appropriate	n	11	7	18
		% line	61,1%	38,9%	
		% column	50,0%	29,2%	39,1%
Total		n	22	24	46
		% line	47,8%	52,2%	100,0%
		% column	100,0%	100,0%	100,0%

Fisher's exact test (p=0,126)

According to the table above, there was not identified a pattern of association between the appropriate practices of PPE and the presence/absence of training on the use of the PPP (p>0.05). Nevertheless, people reported having good practice on PPE (n=18) mostly indicated having already received training (61.1%). However, the total number of people who indicated having incorrect practices of PPE (n=28), mostly had not received any training on the use of PPP (60.7%). It can also be noted that of the 22 people who indicated having the training on the application of PPP, there was a proportional division between good (50%) and bad practices (50%) their use.

At last it was proposed to evaluate the relationship between the presence or absence of appropriate practices related to the destination given to the PPP packaging waste, that is, if the applicators guide such waste to the competent authority in Portugal - Valorfito - and if this type of care is related to the presence of previously received training on the use of PPP. Consider the following table 5.

Table 5: Relation between Appropriate practice of guidance of packaging waste and Training on the use of PPP

			Appropriate practice of guidance of packaging waste		Total
			Yes	No	(% column)
Training on the use of PPP	Yes	n	16	6	22
		% line	72,7%	27,3%	
		% column	61,5%	30,0%	47,8%
	No	n	10	14	24
		% line	41,7%	58,3%	
		% column	38,5%	70,0%	52,2%
Total		n	26	20	46
		% line	56,5%	43,5%	100,0%
		% column	100,0%	100,0%	100,0%

Chi-square test of independence (p=0,034)

According to the table above, there was identified a pattern of association between the variables in the previous table (p<0.05). People who reported guiding the packaging waste to the responsible entity (n=26) mostly indicated having received already training (61.5%). Of the total of people who reported having poor practice (n=20), that is, not send the packaging waste to Valorfito mostly had not received any training on the use of PPP (70%) therefor it can be noted that there is a relationship between having training and properly direct the waste of PPP packaging.

3. DISCUSSION

Because of the toxicity of PPP during their handling, the risks inherent in its use should be taken into account being necessary scientific and technical training in the area to ensure proper identification of the problem and correct decision-making (Calado, 2006). Good training is important for a correct use of PPP fulfilling therefore good agricultural practices, improving the profitability of crops, ensuring safety for the applicators of these products, to consumers of such foods and the environment (Guerra, 2012). Despite the continuous training for farmers (Direcção-Geral de Agricultura e Desenvolvimento Rural, 2014) during this research project it was found that the 46 workers who apply PPP in the various types of crops they produce, only 22 of them had mandatory training by Lei nº.26/2013, 11 April which requires that

after November 26 of 2015 all PPP applicators must have the necessary training for this purpose (Lei n.º 26/2013, de 11 de abril, 2013). These results are in agreement with other studies already carried out in Portugal who claim that there are PPP applicators that do not have the necessary and appropriate training, therefore missing information about the risks and how to act ensuring the safe handling of a PPP (Calado, 2006); (Carvalho, Araújo & Cunha, 2012) even though the training is mandatory (Guerra, 2012).

Regarding the study of the variables *"read the label of plant protection products" and "training on the use of PPP"* was expected that all workers who had the training had the care of reading the label but that was not the case however, most have this correct practice, practice which can also be seen in workers without training. These results were also found in previous investigations that have studied the reading of PPP labels by handlers of these products (Carvalho et al., 2012); (Guerra, 2012) being identified that this practice is present in some workers in Portugal reporting also that only a few mentioned not read the label justifying that they already use these products for a long time and only one said he used the quantities of product that felt right (Guerra, 2012).

Training is an important aspect to take into account in works that use PPP since the applicators have adequate training they know how to act and they proper identify the risks which they are exposed to during the handling of these products and that could lead to better work practices that reduce the risk associated with the various tasks (Costa & Teixeira, 2012) however, studying the results obtained related to the knowledge of all PPE it can be seen that most of the people demonstrated to know the 5 PPE listed in the questionnaires (Guerra, 2012).

The population that often works with PPP in its sector of activity in the production, preparation or application of these products are more exposed that anyone else to these products towards the levels, frequency and variety of PPP that they are occupationally exposed being therefore considered a risk group (Costa & Teixeira, 2012). Although some PPP are characterized with low toxicity they still can cause adverse health problems of applicators (Fernandes, 1990). Some studies show a cause-effect relationship between exposure to PPP and the emergence of diseases in the health of their occupational handlers such as skin diseases, neurological, reproductive and incidence of malignant tumours, these are some examples of pathologies found in employees who work with these products even at low levels. Studies have detected more serious damage at the level of health applicators that applicate this products indoors like in greenhouses when compared to workers who performed the same task but outdoor (Costa & Teixeira, 2012). The risk of occupational diseases caused by use of PPP has been studied worldwide over the years and has recently been found epidemiological evidence which affirm that prostate cancer is related to the use of PPP being leukemia another disease that has been connected to the use of these chemicals at work (Alavanja, Ross & Bonner, 2013). Absorption of PPP in the body depends on the physicochemical properties, dosage, frequency, exposure time to these products, the working environment where the application occurs and the route of exposure (Costa & Teixeira, 2012). In order to reduce the risk of diseases such as cancer the exposure levels should be controlled (Alavanja et al., 2013). and decreased being necessary to take some precautions such as the use of PPE which will reduce the contamination of the human body (Fernandes, 1990). Therefore, the use of PPE is essential for safe use of PPP (Monquero, Inácio & Silva, 2009). The use of PPE such as gloves there are resistant to chemical products, protective suits and masks when handling these products reduces significantly the exposure levels (Alavanja et al., 2013), these were some of the PPE that workers have pointed out in the questionnaires mainly individuals who have training for applying PF (Guerra, 2012).

Situations of accidental intoxications with these products are frequent however they can be prevented with the reading the PPP labels and with the use of appropriate PPE in accordance with the PPP used (Costa & Teixeira, 2012). The proper care of using PPE throughout all PPP handling was noted by the most individuals with training however, it is important to recognize that still are a large number of subjects who should have this practice. It was also noticed with the analysis of the results that even those with no training have correct practices regarding the use of PPE . This finding has also been reported in studies that indicated that most applicators had this practice and the individuals who do not have it justify it with feeling discomfort while using the PPE as well as heat and difficulty in mobility and breathing (Monquero et al., 2009).

The waste from empty containers of PPP should be treated with the same care as the product itself. These packages after being washed up and considerer unusable should be directed to the reception centres in Potugal - Valorfito (Santos, Silva, & Gouveia, 2012). through the study of the results from the questionnaires it was found that most of the applicators with training in the area has a right practice for packaging wastes having this also been discovered in previous investigations (Guerra, 2012).

Increasingly there are strategies that agricultural businesses can use to effectively control pests, diseases and weeds that attack their crops by optimizing the use of PPP. The Integrated Production is a system that ensures the production of food combining different management strategies in order to minimize the use of PPP (ELOECP, 2015) as much as possible

(ECP, 2014). According to its principles, an organism is only considered a pest, disease or weed when it exceeds a certain limit set by area for body type therefor, in order to prevent the emergence of resistance to PPP is not recommended to intervene in the control of that organism when is identified in a low population density. A proper selection of a PPP and fulfil of the instructions given for its use is part of an agriculture that promote good agricultural performance, efficient use of natural resources and achieve environmental protection (ELOECP, 2015).
Organic farming is another method that seeks to enhance agricultural production reducing the use of chemicals ensuring the production of quality food without toxic waste in it allowing profitable the financial costs. Some studies of this type of agriculture lead researchers to claim to be possible by 2020 to produce food without use PPP or genetic modifications. Consequently, with the growing concern of consumers about the food they are eating, with environmental issues and with funding for rural development, this type of food production can be a good replacement for existing agriculture (Paiva, 2010).

CONCLUSIONS

PPP are considered toxic to humans, animals and the environment therefore a good training in the area means that workers on alert to the risks they are exposed to when handling this type of product.
According to the results obtained after the application of the questionnaires in companies of the agricultural sector in the north and centre of Portugal it can be withdraw that the application of PPP is still done by workers who lack the necessary training and required by law being also found that the concern of reading of the labels and the use of PPE are neglected.
These products can enter the body of their handlers by via dermal or if they are inhaled or swallowed. In order to reduce exposure to these products is advised the use of PPE during the handling PPP is also advised to read in full the labels of the products that will be used in order to better choose the means of protection accordingly to the risks which workers are exposed to.
The application of this research project has shown good practices adopted by workers who deal daily with PPP such as reading the labels, use of PPE and correct disposal of waste of empty containers. However it can be noted that there are still aspects to improve the workers' awareness level about the risk they are exposed to when handling these products since not all are careful to adopt good agricultural practices.
The results show the need for further action by the supervisory bodies so that the PPP applicators are only individuals who possess the certificate of compulsory education in the area obligatory by law. It should also be created more awareness campaigns about the safety issues when using these products still raising the importance for reading the labels, use of appropriate PPE for each product type and exposure and direct the waste package correctly to the entity responsible Valorfito.
The lack of studies in the area about the number of people who have the required training, knowledge of what PPE should be use when handling PPP and how to proceed with the empty packaging of PPP product reinforces the need for further research in the agricultural sector. For future studies it is suggested that other variables can be studied and that the exposure levels to which workers are exposed should be measured in the various tasks of handling the PPP like in the preparation of syrup, application and washing the application equipment of product may further studies could be directed to a research for organic farming which is a way of producing food without the use of PPP but who still have occupational risk like any other activity.

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PARENTING SCALE SELF-TEST: ESTUDO DA ESTRUTURA FATORIAL

PARENTING SCALE SELF-TEST: STUDY OF PSYCHOMETRIC PROPERTIES

PARENTING SCALE SELF TEST: ESTUDIO DE LA ESTRUCTURA FACTORIAL

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RESUMO

Introdução: A Parenting Scale Self Test de Gottman e Declaire (1997) avalia o que os pais pensam sobre as emoções e a forma como lhes reagem e pretende determinar a forma pelo qual os pais ensinam os seus filhos a reconhecer, a expressar e a lidar com as emoções.

Objetivo: O objetivo deste estudo é avaliar as propriedades psicométricas, nomeadamente a estrutura fatorial e a consistência interna.

Métodos: A amostra consistiu em 355 pais (65.07% do género feminino e 34.93% do género masculino), cujos filhos adolescentes têm idades compreendidas entre os 14 e os 20 anos. A natureza do presente estudo é quantitativa, analítica e transversal. Foi realizada uma análise fatorial exploratória através do método de componentes principais com rotação direct oblimin.

Resultados: A estrutura da escala revelou-se diferente da original, apresentando 3 fatores relativos aos estilos parentais face às emoções: fator 1- estilo reprovador (explica 13.75% da variância total); fator 2 - estilo explorador (explica 11.41% da variância total) e fator 3 - estilo aceitador (explica 6.27% variância total). A consistência interna da escala apresentou valores de alfa de .87, .85 e .70, respetivamente.

Conclusões: Esta investigação constitui um passo inicial no estudo das propriedades psicométricas da PSST numa amostra da população portuguesa, e poderá ser um importante contributo para futuras investigações e prática clínica.

Palavras-chave: Estrutura fatorial; Parenting Scale Self-Test; Estilos parentais; Adolescentes

ABSTRACT

Introduction: The Parenting Scale Self-Test (Gottman & Declaire, 1997) evaluates what parents think about emotions and the way they react to them. It also tries to determine the ways by which the parents teach their children to recognize, express and deal with emotions.

Objective: The aim of this study is to evaluate the psychometric properties of PSST, namely its factorial structure and internal consistency.

Methods: The sample consisted of 335 parents (65.07% female and 34.93% male) whose children are between 14 and 20 years of age. The nature of the present study is quantitative, analytical and cross-sectional. An exploratory factorial analysis was conducted using the principal components method with direct oblimin rotation.

Results: The structure of the scale changed from the original, presenting in the Portuguese sample three parenting styles towards emotions: 1st factor – disapproving style (explaining 13.75% of total variance); 2nd factor – explorer style (explaining 11.41% of total variance) and 3rd factor – accepting style (explaining 6.72% of total variance). The internal consistency of the scale showed alpha values of .87, .85 and .70, respectively.

Conclusions: This research constitutes an initial step in the study of the psychometric properties of the PSST in a sample of the Portuguese population, and it can be an important contribution for future research and clinical practice.

Keywords: Factorial structure, Parenting Scale Self-Test; Parenting styles; Adolescents

RESUMEN

Introducción: La Parenting Scale Self Test de Gottman y Declaire (1997) evalúa lo que los padres piensan acerca de las emociones y cómo reaccionan a ellas, y que pretende determinar la forma en que los padres enseñan a sus hijos a reconocer, expresar y hacer frente a las emociones.

Objetivo: El objetivo del presente estudio es evaluar las propiedades psicométricas de la PSST: la estructura factorial y consistencia interna.

Métodos: La muestra consistió en 355 padres (65,07% mujeres y 34,93% hombres), cuyos hijos adolescentes tienen edades comprendidas entre los 14 y los 20 años. La naturaleza de este estudio es cuantitativo, analítico y transversal. Un análisis factorial exploratorio se realizó mediante el método de componentes principales con rotación oblimín directo.

Resultados: La estructura de la escala demostró ser diferente de la original, con 3 factores relacionados con los estilos parentales ante de las emociones: factor 1 - estilo reprovador (explica 13.75% de la varianza total); factor 2 - estilo explorador (explica

11.41% de la varianza total) y factor 3 - estilo aceptador (explica 6.27% de la varianza total). La consistencia interna de la escala reveló respectivamente valores alfa de .87, .85 y .70.
Conclusiones: Esta investigación es un primer paso en el estúdio de las propriedades psicométricas de la PSST en un muestra de la población portuguesa, y puede ser una contribución importante para la futura investigación y la práctica clínica.

Palabras clave: Estructura factorial; Parenting Scale Self Test; Estilos parentales; Adolescentes

INTRODUCTION

Based on research about parent-child relationships and the development of emotional regulation skills in children, Gottman, Katz and Hooven, (1996) developed the meta-emotion theory, which argues that parenting styles of emotion socialization relate to their meta-emotion philosophy. The concept of parental meta-emotion philosophy refers to "an organized set of feelings and thoughts about one's own emotions and one's children's emotions" (Gottman et al., 1996, p. 243). Within this framework, each meta-emotion philosophy results in distinct parenting styles of emotion socialization.
The Parenting Scale Self-Test was constructed from this theoretical model that shows that the way parents think and react to their own negative emotional experience determines the attitudes they will have towards the negative emotions of the children and that these, in turn, have repercussions in their children's emotional regulation skills, as well as in other life areas, such as interpersonal relationships and academic performance.
Therefore, studying the psychometric properties of the PSST allows us to know how an instrument of evaluation of the parenting styles of emotional socialization behaves, and then it will allow us to study the effects they have on the adjustment and the competences of the children. In the present research, the authors its factorial structure and internal consistency.

1. THEORETICAL FRAMEWORK

The structured interview on meta-emotion for parents (Katz & Gottman, 1986) is the main instrument for measuring meta-emotion philosophies. Based on the study of this interview, Gottman and Declair (1997) proposed four parenting styles related to emotions: emotion-coaching, laissez-faire, dismissing and disapproving.
The emotion-coaching parenting style is characterized by the acceptance of children's emotional expression. Emotion-coaching parents empathize with and value their children's negative emotions, while helping the child to label the emotions that he or she is feeling, set limits and teach acceptable expression of emotions. The laissez-faire parental style is also characterized by the acceptance and validation of the emotional experience. However, unlike the emotion-coaching style, parents do not set limits on behavior and do not guide the regulation of intense emotional experiences. Parents with a dismissing style consider their children's negative emotional experience to be irrational and do not believe its importance. Thus, they do not accept the negative emotions of their children tending to trivialize and ignore them instead of focusing on the meaning of emotions and promoting their discussion. Also characterized by the non-acceptance of negative emotions in children, the disapproving style rejects emotional expression and may reprimand or punish the children for their emotional expression. These parents believe negative emotions need to be controlled and that they are a sign of weakness.
Meta-emotion theory suggests that the meta-emotion philosophies of parents influence children's emotional regulation abilities as well as their outcomes. A study of Gottman et al. (1996) found that children of parents with an emotion coaching style have fewer illnesses, a greater capacity for emotional regulation, better school performance and more positive relationships with peers. Therefore, in 1997, Gottman and Declaire developed the Parenting Styles Self-Test (PSST), from the meta-emotion interview (Katz & Gottman, 1986). It is a self-response instrument that assesses the parents' beliefs about sadness and anger emotions and how they react to them. Its purpose is to evaluate parenting styles of emotion socialization. Although the research of Gottman at al. (1996) only studied the role of parenting styles of emotion socialization in children aged 4 to 5 years old, the use of PSST in parents with adolescent children was also suggested. The authors of the scale did not study it psychometrically, even though, later on, studies have emerged on the subject.
The first author to study the psychometric properties of PSST was Lee (1999), in a sample of 89 mothers and 11 fathers. For the first administration of the scale Cronbach's alpha values were .33 (laissez-faire), .62 (emotion coaching), .76 (dismissing), and .81 (disapproving), and for the second they were .54, .54 , .83 and .87, respectively. In this study, the emotion coaching style represented the predominant parental style in 91 of the 100 participants on the first administration of the scale. Thus, Lee (1999) suggested the existence of two dimensions that underlie the parenting styles proposed by Gottman and Declaire (1997).

The proposed dimensions are approval/disapproval of emotional expression and active/passive response the emotional expression generates. While dismissing and disapproving parenting styles would be a form of disapproval of emotions, laissez-faire and emotion coaching would translate into approval. Regarding responses, dismissing and laissez-faire styles would be characterized by being a passive response and the disapproving and emotion coaching an active one. In a qualitative assessment of the scale, 25% of respondents criticized the dichotomous response format as it constrains the possibility of responses.

Subsequently, even in a reduced sample of 21 mothers and 10 fathers, Hakim-Larson, Parker, Lee, Goodwin and Voelker (2006), taking into account feedback from Lee study's participants (1999), changed the response format to a Likert type scale , ranging between 1 (always false) and 5 (always true). Thus the scale was renamed to Emotion-Related Parenting Styles Self-Test-Likert (ERPSST-L) and its internal consistency verified as acceptable, obtaining alpha values of .72 (laissez-faire and dismissing), .82 (emotion coaching) and .91 (disapproving).

In 2012, Paterson et al. conducted an exploratory factor analyses using principal axis factor extraction with a direct oblimin rotation in two samples of 107 mothers: one whose children had no developmental difficulties and one in which they presented them (e.g., learning difficulties). In both samples 3 common factors were found: emotion coaching, parental rejection of negative emotions and parental acceptance of positive emotions. In the sample of children without developmental difficulties the factorial solution, with 34 items, explained 42.5% of the total variance. The sample with developmental difficulties presented an additional factor whose content refers to feelings of uncertainty/ineffectiveness in emotion socialization. The four factors of this factorial solution included 32 items and explained 47% of the total variance. After this study, the brief version of the ERPSST-L which comprises 20 items distributed by 4 factors (emotion coaching, parental rejection of negative emotions, parental acceptance of positive emotions and feelings of uncertainty/ineffectiveness in emotion socialization) was presented. Each factor retained the 5 items with stronger loadings, ranging from .30 to .91, on the same factor in both samples. It is noteworthy that the items that were part of dismissing and disapproving parenting styles in the original scale converged on the same factor (parental rejection of negative emotions), also only two items belonging to the laissez-faire parenting style in the original scale were maintained. The internal consistency values of the final scale varied between .70 and .79 in the sample without developmental difficulties and between .76 and .81 in the sample with developmental difficulties. The research on the influence of the emotion socialization styles proposed by Gottman and Declaire (1997) has been carried out mainly with parents with young children (Gottman et al., 1996; Katz & Windecker-Nelson, 2004; Katz & Windecker-Nelson, 2006). However, some studies began to show that the meta-emotion philosophy of parents relates to the emotional experience of adolescent children. Adolescents whose mothers have an emotion coaching parenting style have shown higher self-esteem and less aggressive behaviors as well as lower depressed mood compared to children whose mothers have a dismissing parenting style (Katz & Hunter, 2007). In a study of Stocker et al. (2007) the emotion coaching parenting style was also found related to lower internalizing symptomatology in children. When mothers accept and offer guidance to adolescents at times when they express anger, they have shown a better ability to regulate this emotion and less externalizing behaviors (Shortt, Stoolmiller, Smith-Shine, Eddy, & Sheeber, 2010).

Only one investigation (Gupta, 2012) that used the original dichotomous response scale as an assessment instrument was found. In it, only the emotion coaching and dismissing factors were used, which respectively obtained values of internal consistency of .71 and .80. We also found that other studies have used the Likert-type response format version of the PSST (Hakim-Larson et al., 2006) and the short form of Paterson et al. (2012), or other instruments, such as the structured interview on parent meta-emotion (Parent Meta-Emotion Interview; Katz & Gottman, 1986), the Maternal Emotional Styles Questionnaire (Lagacé-Séguin & Coplan, 2005), which was adapted from Katz and Gottman's (1999) meta-emotion interview, the Coping with Children Negative Emotions (Fabes, Poulin, Eisenberg, & Madden-Derdich, 2002), and the Parent Affect Test (Linehan, Paul, & Egan, 1983).

In this study it is intended to investigate the psychometric properties of PSST (Gottman & Declaire, 1997). Thus, we study the factorial structure and the internal consistency of the scale in a sample of parents with adolescent children in Portugal.

2. METHODS

A quantitative, analytical and cross-sectional study was developed.

2.1 Participants

The sample of 355 parents of the present study consisted of 231 women (65.07%) and 124 men (34.93%).Their ages varied between 33 and 60 years (M= 45.57; SD= 4.31), and no significant differences between genders were obtained (t (345)= -.709, *p*= .479). With regard to the offspring f these parents they indicated that 58.7% were female (202 girls) and 41.3% male (142

boys). Their ages ranged from 14 to 20 years old (M= 16.23, SD= 1.66), with girls (M= 16.43, SD= 1.63) being slightly older (t (341) = 2.53, *p*= .012) than boys (M= 15.97, SD= 1.68). Most of the children (92.09%) were aged between 14 and 18 years old. It was found that some parents did not indicate their age or that of their children.

2.2 Measures

The PSST (Parenting Styles Self-Test) is a self-response instrument that seeks to evaluate the parenting style of emotion socialization based on the theory of meta-emotion philosophy (Gottman & Declaire, 1997).

The instrument comprises 81 items: 23 items belonging to emotion coaching parenting style, 10 items to laissez-faire, 25 items to dismissing and 23 items to disapproving. The response format is dichotomous (True/False); the items marked true being punctuated with 1 and the items marked with false being punctuated with 0. These scores are summed in each factor and divided by the number of items of the corresponding factor. The highest result corresponds to the predominant parenting style of the responding parent.

2.3 Procedure

The National Data Protection Commission and the ethics committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra approved this study.

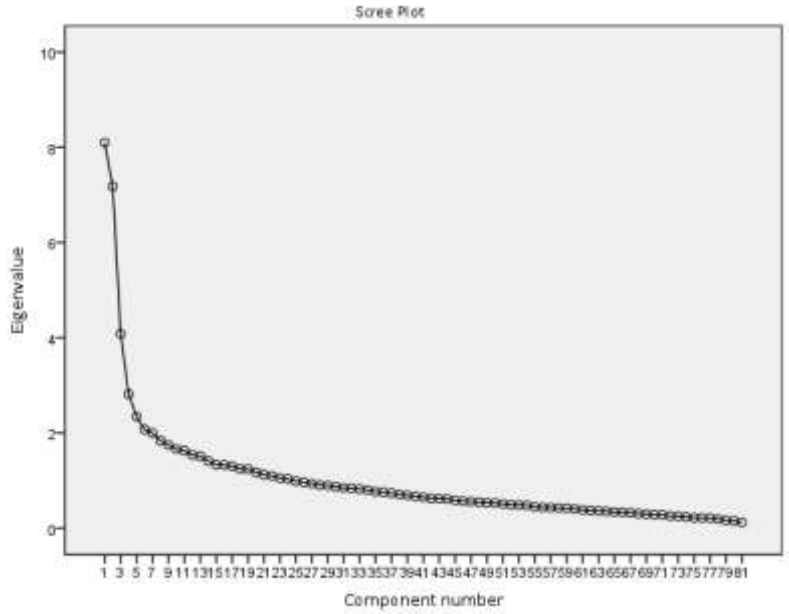
The sample of parents of this study was collected by students who attended the Psychology course as part of a non-compulsory task included in a course unit. The criterion of selection of these students required that they had a maximum age of 20 years old or parents who had another child between the ages of 14 and 20 years old, since it was intended to evaluate the psychometric properties of the scale in parents whose children were within this age group. Students from private English classes and youth movements within this age group were also recruited. The parental evaluation protocol was delivered to the students in an envelope, which contained an explanatory letter about the purposes of the investigation and the indication of returning the sealed envelope to the children after completing the protocol. Subsequently, the envelopes were collected by the investigators in the schools or headquarters of the youth movements.

To study the psychometric properties of PSST we used the *Statistical Package for Social Sciences* (SPSS), version 22.0 for *Windows*. Initially it was verified if the sample fulfilled the requirements for performing an Exploratory Factor Analysis. The criterion was that a sample of more than 300 cases is considered good for carrying out the analysis in question (Tabachnick and Fidell, 2007). The Kaiser-Meyer-Olkin (KMO) test and the Bartlett sphericity test were used to analyze the adequacy of the data to perform a factorial analysis. The Exploratory Factor Analysis was performed using Principal Component Analysis followed by oblique rotation (direct oblimin), as happened in the study by Paterson et al. (2012) and because this is used when it is theoretically assumed that factors are related to each other (Field, 2009). Factor retention was performed taking into account the scree plot analysis and the Kaiser criterion (eigenvalues greater than 1). The criterion used for loadings was the one of Tabachnick and Fidell (2013) who consider that values greater than or equal to .32 constitute the minimum value for an item to be interpreted in a given factor. The reliability of the scale was studied using Cronbach's alpha. The magnitude of the correlations of each item with the total scale was analyzed.

3. Results

A Principal Component Analysis was performed, where a KMO value of .811 - a value that is considered very good (Hutcheson and Sofroniou 1999 cit in Field, 2009) was observed. Bartlett's sphericity test ($\chi 2$ ($_{1128}$) = 5383,716; p = .000) was significant and also an indicator of the adequacy of the data for the factorial analysis.

The Principal Components Analysis with direct oblimin rotation resulted in the extraction of 25 factors, however the distribution of the items did not make sense theoretically. Thus, according to the structure proposed by Gottman and Declaire (1997), the scale was forced to the extraction of 4 factors that explained 27.37% of the total variance, but these factors were not theoretically interpretable. According to Lee's (1999) hypothesis, that states that parenting styles could represent two underlying dimensions, a 2 factor solution was forced. However, this was not feasible, since it only explained 18.86% of the total variance. Factorial solutions were also investigated according to the criteria used by Paterson et al. (2012), but the internal consistency of the extracted factors was lower (between .66 and .82) than those of the solution that is presented. In the solution forced to the extraction of 4 factors, a large inflection from factor 3 to factor 4 was verified in the scree plot.



Graphic 1: Scree plot

A forced solution of 3 factors was explored which, despite explaining only 23.90% of the total variance, presented a logical pattern in the distribution of items.
The loadings of 25 items were below .32, so they were removed (8 items that originally belonged to the dismissing parenting style, 7 items that belonged to the disapproving, 6 items that belonged to laissez-faire, 4 items that belonged to the emotion coaching). After completing this procedure, 8 items loading in factors that did not make sense theoretically were removed. After removing these items, the final solution explains 31.43% of the total variance and has loadings between .35 and .77. Three factors were found: 1 - disapproving style (explaining 13.75% of the total variance and representing the dismissing and disapproving parenting styles of the original scale), factor 2 - explorer style (explains 11.41% of the total variance) and factor 3 - accepting style (explains 6.27% total variance). The items comprising factor 2 and 3 originate themselves from the emotion coaching parenting style, so none of the factors present items related to the laissez-faire parenting style.

Table 1. *Loadings (N = 355)*

Items	F1	F2	F3
F1. Disapproving style			
48. Kids get angry to get their own way.	.66		
50. If you let kids get angry, they will think they can get their way all the time.	.63		
47. A child's expressing anger amounts to a temper tantrum.	.62		
3. Children acting sad are usually just trying to get adults to feel sorry for them.	.55		
68. When my child is angry I think, "Why can't she accept things as they are?".	.55		
11. Children often act sad to get their way.	.53		
45. I don't think it is right for a child to show anger.	.52		
49. When my child gets angry, I worry about his destructive tendencies.	.50		
82. Angry children are being disrespectful.	.49		
22. When my child acts sad, it's to get attention.	.47		
19. I think when kids are sad they have overemphasized the negative in life.	.46		
27. Children really have very little to be angry about.	.46		
67. When my child is angry I think, "If only he could just learn to roll with the punches.	.46		
60. Anger accomplishes nothing.	.45		

40. When my child gets sad, I warn her about not developing a bad character.	.44
1. Children really have very little to be sad about.	.43
13. Sadness is something one has to get over, to ride out, not to dwell on.	.43
32. Childhood is a happy-go-lucky time, not a time for feeling sad or angry.	.43
24. A lot of child's anger comes from the child's lack of understanding and immaturity.	.41
46. Angry people are out of control.	.41
55. When my child gets angry, I think it's time for a spanking.	.41
9. If you ignore a child's sadness it tends to go away and take care of itself.	.40
41. When my child gets sad, I warn her about not developing a bad character.	.39
59. When I'm angry, I feel like I'm going to explode.	.39
66. When my child gets angry with me I think, "I don't want to hear this."	.39
58. When my child is angry, I usually don't take it all that seriously.	.38
53. Anger tends to cloud my judgment and I do things I regret.	.37
14. I don't mind dealing with a child's sadness, as long as it doesn't last long.	.36
56. When my child gets angry, my goal is to get him to stop.	.35
F2. Explorer style	
34. When my child is sad, I try to help him figure out why the feeling is there.	.77
31. The important thing is to find out why a child is feeling sad.	.72
28. When my child is sad, I try to help the child explore what is making him sad.	.71
29. When my child is sad, I show my child that I understand.	.68
43. When my child is angry, I try to be understanding of his mood.	.68
65. It's important to help the child find out what cause the child's anger.	.67
39. The important thing is to find out why the child is feeling angry.	.66
71. When my child is angry I want to know what she is thinking.	.65
64. When my child is mad, I just find out what is making her mad.	.61
33. When my child is sad, we sit down to talk over the sadness.	.60
23. Anger is an emotion worth exploring.	.37
F3. Accepting style	
37. I want my child to experience anger.	.68
69. I want my child to get angry, to stand up for himself.	.59
26. When my child is sad, it's a chance to get close.	.57
38. I think it's good for kids to feel angry sometimes.	.57
35. When my child is angry, it's an opportunity for getting close.	.55
30. I want my child to experience sadness.	.53
62. A child's anger is important.	.43
54. When my child is angry, it's time to solve a problem.	.38

The analysis of the relationship between the factors revealed that the disapproving style is negatively related to the explorer and accepting styles, and that these two factors are positively related to each other (see Table 2).

Table 2. *Pearson's r values among PSST factors*

	Disapproving style	Explorer style
Disapproving style	1	
Explorer style	-.02	1
Accepting style	-.05	.13*
Note. *p*= .012		

Items were studied through the averages and standard deviations of the item, the item-total correlations and the value of Cronbach's α when the item is removed. The item-total correlations were above .20, ranging between .26 and .70 (see Table 3).

The internal consistency of the scale, assessed by Cronbach's alpha, revealed good alpha values in factor 1 (.87) and factor 2 (.85), and a reasonable value for factor 3 (.71) (see Table 3).

Table 3. Means *(M) and Standard Deviations (SD), Item-total Correlations (r), Cronbach's alpha when the item is removed (α), and Cronbach's alpha of the factors*

Items	*M*	*DP*	*r*	*α*
F1. Disapproving style (α = .87)				
48. Kids get angry to get their own way.	.45	.50	.58	.86
50. If you let kids get angry, they will think they can get their way all the time.	.32	.47	.55	.86
47. A child's expressing anger amounts to a temper tantrum.	.33	.47	.54	.86
3. Children acting sad are usually just trying to get adults to feel sorry for them.	.41	.49	.49	.86
68. When my child is angry I think, "Why can't she accept things as they are?".	.43	.50	.48	.86
11. Children often act sad to get their way.	.42	.50	.47	.86
45. I don't think it is right for a child to show anger.	.31	.46	.45	.86
49. When my child gets angry, I worry about his destructive tendencies.	.33	.47	.43	.86
82. Angry children are being disrespectful.	.52	.50	.42	.86
22. When my child acts sad, it's to get attention.	.21	.40	.42	.86
19. I think when kids are sad they have overemphasized the negative in life.	.45	.50	.40	.86
27. Children really have very little to be angry about.	.39	.49	.42	.86
67. When my child is angry I think, "If only he could just learn to roll with the punches.	.46	.50	.39	.86
60. Anger accomplishes nothing.	.58	.49	.39	.86
40. When she gets sad, I warn her about not developing a bad character.	.55	.50	.37	.87
1. Children really have very little to be sad about.	.49	.50	.37	.87
13. Sadness is something one has to get over, to ride out, not to dwell on.	.21	.41	.37	.87
32. Childhood is a happy-go-lucky time, not a time for feeling sad or angry.	.74	.44	.38	.87
24. A lot of child's anger comes from the child's lack of understanding and immaturity.	.43	.50	.35	.87
46. Angry people are out of control.	.49	.50	.36	.87
55. When my child gets angry, I think it's time for a spanking.	.22	.42	.36	.87
9. If you ignore a child's sadness it tends to go away and take care of itself.	.18	.39	.36	.87
41. When she gets sad, I warn her about not developing a bad character.	.62	.49	.34	.87
59. When I'm angry, I feel like I'm going to explode.	.46	.50	.34	.87
66. When my child gets angry with me I think, "I don't want to hear this."	.21	.41	.34	.87
58. When my child is angry, I usually don't take it all that seriously.	.35	.48	.34	.87
53. Anger tends to cloud my judgment and I do things I regret.	.59	.49	.32	.87
14. I don't mind dealing with a child's sadness, as long as it doesn't last long.	.37	.49	.31	.87
56. When my child gets angry, my goal is to get him to stop.	.70	.46	.31	.87
F2. Explorer style (α = .85)				
34. When my child is sad, I try to help him figure out why the feeling is there.	.89	.32	.71	.82
31. The important thing is to find out why a child is feeling sad.	.95	.23	.62	.83
28. When my child is sad, I try to help the child explore what is making him sad.	.95	.23	.62	.83
29. When my child is sad, I show my child that I understand.	.93	.26	.60	.83
43. When my child is angry, I try to be understanding of his mood.	.92	.27	.59	.83
65. It's important to help the child find out what cause the child's anger.	.96	.19	.56	.84
39. The important thing is to find out why the child is feeling angry.	.91	.29	.55	.83
71. When my child is angry I want to know what she is thinking.	.90	.31	.58	.83
64. When my child is mad, I just find out what is making her mad.	.91	.28	.51	.84
33. When my child is sad, we sit down to talk over the sadness.	.86	.35	.51	.84
23. Anger is an emotion worth exploring.	.75	.43	.31	.87
F3. Accepting style (α = .71)				
37. I want my child to experience anger.	.34	.48	.55	.64
69. I want my child to get angry, to stand up for himself.	.42	.49	.38	.68
26. When my child is sad, it's a chance to get close.	.57	.50	.46	.66
38. I think it's good for kids to feel angry sometimes.	.62	.49	.43	.67
35. When my child is angry, it's an opportunity for getting close.	.46	.50	.41	.68
30. I want my child to experience sadness.	.58	.49	.43	.67
62. A child's anger is important.	.53	.50	.26	.71
54. When my child is angry, it's time to solve a problem.	.48	.50	.27	.71

Gender differences in parenting styles adopted by parents of both genders were studied using Student t-tests. It was found that there were no significant differences in disapproving and accepting styles. As for the explorer style, significant differences were found, with mothers presenting higher values than fathers (see Table 4).

Table 4. *Gender differences between mothers and fathers in the three factors of PSST*

	Mothers (n = 231)		Fathers (n = 124)				
	M	*DP*	*M*	*DP*	*t*	*p*	*d*
Disapproving style	.43	.22	.41	.23	.59	.58	.00
Explorer style	.93	.15	.85	.23	3.43	.001	.03
Accepting style	.49	.28	.53	.29	-1.20	.23	.00

4. DISCUSSION

The exploratory factor analysis revealed a different structure from the original scale, so the Portuguese version of PSST is composed by three factors.

The first factor, disapproving style, represents a parenting style that does not accept and rejects negative emotions of the children. The second factor, explorer style, is characterized by the attempt to discover what triggered the negative emotional experience. Thus, negative emotional experience is not criticized, but parents do not seem to adopt behaviors that teach strategies of emotional regulation in order to facilitate the understanding of the negative emotional experience, exploring only its causes. The third factor, accepting style, regards negative emotions as natural and positive for development, as well as an opportunity for establishing closeness with children. However, it is not clear how parents take this opportunity.

Regarding the psychometric characteristics of the Portuguese version of the PSST, the three factors explained 31.43% of the total variance. The disapproving style accounted for 13.75% of the total variance and consisted of 29 items, the explorer style with 11 items explained 11.41% of the total variance, and the accepting style with 8 items and accounted for 6.27% of the total variance. The items had good item-total correlations, above .26, and were theoretically congruent in all the factors. Two factors have good internal consistency values (disapproving style: $\alpha = .87$, explorer style: $\alpha = .85$), but the accepting style did not present such high values ($\alpha = .71$).

With respect to the association between factors, a negative association was found between the disapproving style and the explorer and accepting ones, suggesting that parents who describe themselves as disapproving do not review the characteristics of explorer or accepting styles in them. On the other hand, these last two factors are positively and significantly associated, suggesting that when scores are high in one, high scores are obtained in the other. This association fits theoretically, since both factors reveal acceptance of the negative emotional experience and seem to be parenting styles that seek to help children cope with their negative emotions.

As in the case of previous studies (Lee, 1999; Paterson et al., 2012), the dismissing and disapproving styles of the original scale have become one. Thus, the items of these factors seem to represent only rejection of negative emotional experience, rather than two distinct parenting styles (Paterson et al., 2012). Furthermore, Gottman and Declaire (1997) assume that these two parenting styles have the same consequences in the children, which was verified in the study by Hakim-Larson et al. (2006). The parental laissez-faire style did not remain in this version of the PSST and none of the items that belonged to it were retained. In fact, we were able to verify that in the several studies on psychometric properties of the scale (Hakim-Larson et al., 2006; Lee, 1999), this factor had the lowest values of internal consistency. Thus, the items that comprise the explorer and accepting styles, in the Portuguese version of PSST, come only from the emotion-coaching style of the original scale. Nevertheless, it should be noted that their content does not seem to reflect clearly the true characteristics of emotion-coaching parents, as conceptualized by Gottman and Declaire (1997). The items do not present the characteristics of an emotion-coaching parent that besides accepting, also empathizes and validates emotions, and teaches to label and to regulate them. Additionally, it was verified that no version of the PSST has items referring to other emotions, besides sadness and anger, that also appear in the emotional repertoire of children and to which the parents also respond, like anxiety and frustration.

The PSST, built on the theoretical model of meta-emotion philosophies, seems to be a promising instrument to use in the contexts of evaluation, prevention and intervention with parents of adolescents' children. Besides, adolescence is a developmental stage for which there do not seem to be many investigations that study the role of parenting styles in the regulation of emotions in adolescents. Thus, the present investigation is an initial step in the study and adaptation of the PSST in a sample of Portuguese population, which adds data to the existing one and proposes future lines of research.

CONCLUSIONS

This study investigated the dimensionality of PSST - Portuguese Version, an instrument for evaluating parenting styles related to emotions. In the sample of Portuguese parents the scale revealed three factors (disapproving, explorer and accepting parenting

styles), for which 48 items are distributed. In general, the scale presented good values of internal consistency (disapproving style: α = .87, explorer style: α = .85, accepting style: α = .71). A potential limitation of our study arises from the existence of a much higher number of mothers comparing with the frequency of fathers. In future studies it would be important to have more balanced samples. On the other hand, the sample size of the present study meets Tabachnick and Fidell's (2007) criterion for doing a psychometric study in comparison with other investigations whose samples did not meet these criteria (Hakim-Larson et al., 2006; Lee, 1999; Paterson et al., 2012). The convergent and divergent validity of this version of the PSST was not analyzed and should also be studied in future investigations. Likewise, it would be important to study the temporal stability and perform a confirmatory analysis of the scale's structure obtained. Given the absence of a factor that expresses the emotion-coaching parenting style, as proposed by Gottman and Declaire (1997), it could be interesting to develop items that represent this parenting style clearly and also include items about other emotions, in order to analyze the parenting style of emotion socialization that parents use with them. The inclusion of these items would allow a more accurate analysis of how parents may deal differently with various emotions. It would also be important to study other versions of the scale, namely ERPSST-L, in order to find the response format (Likert type or dichotomous) that best suits the Portuguese population.

CONFLICT OF INTERESTS

The authors have no conflicts of interest.

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A HUMANIZAÇÃO NA ASSISTÊNCIA AOS PACIENTES EM HEMODIÁLISE

HUMANIZATION OF CARE PATIENTS IN HEMODIALYSIS PROGRAMM

LA HUMANIZACIÓN EN LA ATENCIÓN DE LOS PACIENTES QUE RECIBEN HEMODIÁLISIS

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RESUMO

Introdução: A conceção sobre a privacidade do cuidar em hemodiálise salienta que a pessoa é um ser no mundo que comporta várias dimensões, interage com o meio ambiente e vivencia experiências únicas que marcam a sua individualidade.

Objetivo: Identificar os focos de atenção nas práticas de cuidados prestados aos pacientes em programa regular de hemodiálise, que garantam o respeito pela sua individualidade e privacidade.

Métodos: Recorreu-se à abordagem qualitativa, seguindo os preceitos da fenomenografia, utilizando-se entrevista semiestruturada com uma questão aberta: Os pacientes em Programa Regular de Hemodiálise têm uma assistência médica, de enfermagem e de assistentes operacionais que garanta o respeito pela sua individualidade e privacidade? Efetuadas entrevistas a 12 profissionais de saúde a desempenhar funções em unidades de hemodiálise, cuja análise e interpretação dos dados, apresentaram como foco a descrição dos significados qualitativamente diferentes em dimensões de variação.

Resultados: Os profissionais de saúde desvelam atenção sobre a preservação da privacidade do cuidar em hemodiálise, nas práticas de cuidados, traduzidos pelas dimensões, espaço físico, exposição corporal, humanização dos cuidados e comunicação.

Conclusões: Nas dimensões percebidas, sobre preservação da privacidade durante os procedimentos em hemodiálise, os profissionais de saúde enfocam a atenção, que pela sua natureza e sequência revelam preocupações durante a execução dos procedimentos. O respeito pela individualidade e privacidade, considerados como necessidades humanas básicas a promover e a sua preservação, representam-se cuidados relevantes como garantia do respeito pelos pacientes em programa regular de hemodiálise.

Palavras-chave: Privacidade; Cuidados de Saúde; Enfermagem.

ABSTRACT

Introduction: The design on the privacy in hemodialysis stresses that the person is a being in the world that has various dimensions, interacts with the environment and experiences unique experiences that mark their individuality.

Objective: To identify the focus of attention on the practices of care for patients in regular hemodialysis program, guaranteeing respect for their individuality and privacy.

Methods: resorted to the qualitative approach, following the precepts of fenomenografia, using semi-structured interviews with only one open question: Patients in Hemodialysis regular program have a medical, nursing and operational assistants to ensure respect for their individuality and privacy? Twelve health professionals were interviewed to perform functions in hemodialysis units, whose analysis and interpretation of the data presented as a focus the description of the qualitatively different meanings in variation dimensions.

Results: Health care professionals reveal the preservation of the privacy of care in hemodialysis, in the care practices, translated by dimensions, physical space, body exposure, humanization of care and communication.

Conclusions: In the perceived dimensions, on the preservation of privacy during procedures on hemodialysis, healthcare professionals value the focus of attention which by their nature and sequence invoke concerns over the implementation of the procedures. Respect for individuality and privacy are considered a basic human need to be promoted and their preservation is an important care to guarantee respect for patients on regular hemodialysis.

Keywords: Privacy; Health Care; Nursing.

RESUMEN

Introducción: El diseño en la privacidad de la atención en la hemodiálisis hace hincapié en que la persona es un ser en el mundo que tiene varias dimensiones, interactúa con el medio ambiente y experimenta experiencias únicas que marcan su individualidad.

Objetivo: Identificar el foco de atención en las prácticas de atención a los pacientes en programa de hemodiálisis periódica, garantizando el respeto a su individualidad y privacidad.

Métodos: recurrió al enfoque cualitativo, siguiendo los preceptos de fenomenografia, a través de entrevistas semiestructuradas con sólo una cuestión abierta: Los pacientes en hemodiálisis programa regular tienen un médico, de enfermería y asistentes operativos para garantizar el respeto de los su individualidad y la privacidad? Las entrevistas se llevaron a cabo a 12

profesionales de la salud para realizar funciones en las unidades de hemodiálisis, cuyo análisis e interpretación de los datos presentados se centró en la descripción de cualitativamente diferentes significados en diferentes dimensiones.
Resultados: Los profesionales de salud revelan la atención en la preservación de la privacidad de la atención en hemodiálisis, en las prácticas de atención, traducidos por las dimensiones, espacio físico, visualización cuerpo, de humanización de la atención y la comunicación.
Conclusións: En las dimensiones percibidas, en la preservación de la privacidad durante los procedimientos en hemodiálisis, los profesionales sanitarios valoran el foco de atención que por su naturaleza y secuencia de invocar la preocupación por la aplicación de los procedimientos. El respeto a la individualidad y la privacidad son considerados una necesidad humana básica para ser promovidos y su preservación es una atención importante para garantizar el respeto de los pacientes en hemodiálisis periódica.

Palabras clave: Privacidad; Cuidado de Salud; Enfermería.

INTRODUCTION

The perception about privacy during the care practices shows the person as a being in the world that involves various dimensions, interacts with the environment and experience unique experiences that mark their individuality (Watson, 2008). The essence of nursing, as well as of other areas of knowledge requires an understanding of the other's needs and its significance, guiding their practices by the values essential to human nature.
"Take care of the person" and the "touch the body" are also therapeutic interactions that relate to privacy and therefore go beyond the traditional obligations of information concerning the person and are under a duty to respect for human dignity. Nursing care happens, often, physical exposure, the communication of personal data or non-verbalized "touch". The essentials of science and art of care is to preserve intimacy. Disregard for privacy constitutes a real threat to the internal equilibrium of each human being and prevent to respond to their basic needs and, consequently, solve their internal conflicts (Watson, 2002).
Despite the efforts of health care professionals in order to humanize the care, this task is difficult in hemodialysis units, as it requires individual and collective attitudes to privacy are respected, the individuality and dignity of patients. These, in addition to suffering by biological impairment, show discomfort and embarrassment to stay often exposed by the invasion of his privacy. The loss of privacy can lead to a high stress levels increase and pain during treatment. We take privacy as a basic human need to be promoted, so preserve it presents itself as a value and a right, ensuring respect for the patient (Soares & Dall Agnol ´, 2011).
The concern for privacy has been subject of several investigations worldwide (Leino-Kilpi, Välimäki, Dassen, Gasull, Lemonidou & Schopp, 2003; Baggio, Pomatti, Bettinelli & Erdmann, 2011), in order to ensure its preservation as a universal right. In Portugal is guaranteed and ensured by the Constitution of the Portuguese Republic, articles 26 and 64; in the Charter of rights of hospitalized patients and at the United Nations and in the Universal Declaration of human rights in 1984, article 12 .
The curious to study this issue resulted from various concerns and reflections of the authors ' careers in various contexts, whether at the level of clinical practice, as well as in teaching, with regard to all issues involving the privacy of patients under hemodialysis treatment. Focusing on these concerns, the purpose of this research is to obtain the views of a particular group of health professionals who have experience in relation to the phenomenon of care privacy preservation in hemodialysis, in order to get a holistic view of the set of qualitatively different perceptions. In this sense, the goal is to identify the foci of attention care practices to patients on regular dialysis program, guaranteeing the respect for their individuality and privacy.

1 - METHODS

Developed a qualitative study, descriptive exploratory and analytical type, following the precepts of fenomenography, resorting to the use of interview with just an open issue: patients on regular dialysis program have medical, nursing and operational assistants that guarantees respect for their individuality and privacy?
The number of participants was not determined at the outset, but set in the course of the production process of empirical data, considered sufficient for an understanding of the phenomenon under study. Based on the assumption that in qualitative research the selection of participants is intended, when the purpose of the researcher is to have a selected sample of participants who can better contribute to the research, making a selection of information rich cases for in-depth study (Fortin, Côté & Filion, 2009). Were interviewed 12 health professionals (4 nephrologists, 4 nurses and 4 operational assistants) and each

interview was identified with a number according to their realization (E1 ... E12). Considered as criteria for inclusion: perform functions in hemodialysis units of Portugal and accept to participate in the study.
In the methodological path was guaranteed the respect of all the assumptions inherent in the deontological ethics of research and pointed out in the Declaration of Helsinki. To carry out the interviews we have provided the respective formal authorization of the units involved, paying particular attention to obtaining the informed consent of all participants.
The data collection took place between June and September 2011, a place previously prepared, so as to provide a calm environment. Each participant was previously contacted to schedule the time and date of the interview. Each interview was identified with a number, according to their realization (E1 ... E12), your transcript is made in full, a task performed by us, using a word processing program, which has enabled us to recover part of the environment, the hesitations, the expressions, the feelings with which these us reported phenomenon under study.
The analysis and interpretation of the data were based on fenomenography showing how to focus the analysis of dimensions. The use of fenomenography structure, "result space", allowed the analytical representations: categories of description and a description of the qualitatively different meanings and dimensions of variation (Akerlind, Bowden & Green, 2005).
All interviews were transformed into documents with extension RTF (Rich Text Format). To build the base of the data collected, we used the Qualitative software Solutions Research 10 Nvivo (QSR Nvivo).

Four areas have been identified, structured in dimensions regarding semantics, describing the approach of the systems of meanings assigned by participants in the provision of health care in hemodialysis, regarding: the expressions used by health professionals about the perception of privacy in hemodialysis units, reasons to preserve privacy and ways of how to report and experience it.

2 - RESULTS AND DISCUSSION

Aiming at the scientific quality of the study are based the critical differentiators, qualitatively different experience shapes and descriptions of the experience/understanding phenomenon modes (Akerlind, Bowden & Green, 2005).
The categorization process of the health professional's reports emerged four dimensions presented and analysed below.

Physical Space

Man, as a social being, organizes himself within physical surroundings and relates to others within a physical environment. The concept of physical space is variable, because it depends on the size of the hemodialysis rooms and the number of monitors in them. According to the scientific literature (& Guirardello Milanez Gasparino, 2006), the space is often flouted, including by members of the health team, perhaps because these people don't identify the physical needs or territorial patients, corroborating the account of that, *unfortunately, the logistics of hemodialysis and the need to monetize costs, privacy is not preserved during the sessions* (E1).
During the treatment procedures of dialysis patients, professionals often need to invade your space, however it is crucial that these, identify the negative feelings expressed by patients against invasion of their personal space and territory, in order to minimize these feelings and provide a better adaptation of the patient during the treatment period under hemodialysis, as mentioned, *about privacy although try to keep is always difficult, because patients are in an open room, side by side, thus limiting the interventions needed to be made to patients during dialysis* (E2).
The need for improvement of architectural spaces of these units leaves no doubt about his contribution to the well-being of all who use them. Due to the intensity of the treatment, the need for quality of these spaces, which should be ample and comfortable as possible. The distance between the armchairs must be adequate to provide comfort and privacy, favoring the functionality and space organization, without losing the focus on environmental and visual comfort (Gasparino & Guirardello, 2006; Ribeiro, 2008).
According to Portuguese law, hemodialysis units shall comply with those set out in article 49 and article 51 of Decree-Law No. 505/99 of November 20, on amendments to the Decree-Law No. 241/2000 of September 26 and technical recommendations for hemodialysis services Central Administration of Health Services (ACSS) dated June 2011, setting the requirements the dialysis units shall comply with regard to facilities , organization and functioning, in order to ensure the technical quality and assistance to patients on Regular Dialysis Program, in order to comply with the legal provisions relating to physical space.
We must reiterate the speech, *the number and patients in need of dialysis has been increasing progressively in recent years* (E3).
According to the legislative recommendations in structural terms of dialysis units and the technical recommendations of the ACSS, dialysis rooms must have the following characteristics: easy access to exterior and concourses with at least 1 m wide;

appropriate natural or artificial light; adequate aeration and regulating the room temperature (max. 25° C and minimum 18ºc); 1.8 m wide and 2.5 m in length for each rank of hemodialysis and easy movement. Considering these recommendations, the results reveal there are aspects to improve in particular the space between units, physical separators between patients (not only walls and curtains); decrease of noise which causes in conversations between patients and the doctor with the patient and the patient with the nurse. A qualitative study (Ribeiro, 2008) about significant situations in context of hemodialysis, the authors state that these units should have an appropriate physical space to carry out treatments on dialysis, in which is assigned a very high degree of importance to the comfort.
It is considered that the terms privacy and dignity are interrelated concepts. The dignity incorporates many features of the individual privacy, such as respect for the person, the privacy of the body, space and privacy (Pietrovski & Dall'Agnol, 2006).

Body Exposure
Healthcare allows his actors access to the body and to information about the conditions of life and health of those who seek the care and service. In the hospital environment often emerging issues involving the privacy of the patient (Woogara, 2004). In a study performed in hospitalized patients, the authors report that patients state that exposure occurs in your body and others, notoriously, during the procedures performed by the nursing staff, such as: bath, hygiene, clothes, wound care, among others. This exposure, sometimes unnecessary, causes embarrassment, discomfort, anxiety, insecurity and psychological stress.

When we provide health care, concern about bodily exposure is present, however, due to the existing physical space according to each context and on our research in hemodialysis units, this is not always possible, according to testimony, *the privacy of patients is not preserved during sessions with physical exposure to other patients and health professionals, there is an effort by the multidisciplinary team in minimizing this aspect but it is not always possible to guarantee in the case of complications such as vomiting, diarrhea, a PCR* (E1, E3). This situation goes against the established by the Central Association of Health Service when it refers that treatment stations that are in open space, shall provide the possibility of isolation of each patient, if necessary by separators.
Front of the impotence felt by patients often display your body and the body of another during hemodialysis care, it is important to reference the featured role of nurse, which must adopt a critical and reflective stance by putting in evidence the skills required in the act of procedure with the person in dialysis treatment (Soares & Dall´Agnol, 2011). Some reports have shown the importance of these competences of the health team, contributing or providing to the patients the privacy required in terms of body exposure, *with my training and experience would like to be able to say with any conviction that this exposure is always safeguarded, the truth is that it is not always possible to do so, although it's always hard to try by the existing structure of the dialysis rooms where space is very conditioned* (E6).
In a study it was found that nursing touches the body and exposes the patient, often without asking, adopting a power stance (Akerlind, Bowden & Green, 2005). The patient presents feelings as embarrassment and shame, however little questions this invasion, believing it necessary for their treatment. Some inconsistency concerning this study findings stands, through the reports experienced by health professionals, *verbalizing that privacy in the body of patients exposure in regular hemodialysis program is always a barrier is broken by his own patients, due to their chronic disease situation, simultaneously it is a pity that the dialysis rooms cannot prevent this situation from happening but they like to be together* (E8).
In all situations, the requirements of the healthcare practice at this level of exposure can evolve, keeping in mind the dignity of a person, how to explain the reports *I think with mutual effort will we be able to achieve this level of quality in care, we do our best and as we know this type of patients, we have shared with them every day we try to preserve the body with the curtains and screens, ensuring care practice with respect and excellence* (E12).

In some cultures you learn that expose the body is not suitable, being referenced implicitly with the nudity and consequently repressed cultural standards. However, it is important to emphasize the rights of people and the health professionals who are in constant contact with this exhibition, it becomes essential to safeguard these rights. In the dialysis units are witnessing investment body accented in the name of efficiency and technological innovation and the frequent questions about the results of the work done. This invasive property, challenges and guides the nurse to a practice where the care of the body about the spirit and the suppression of sensitivity are required in the name of science that we need to raise awareness (Pupulim & Sawada, 2002; Smith, 2010).

Humanization of care
Several studies have been developed at the present time within the humanization of care nursing science.

According to the authors of a systematic review study (Simões, Rodrigues & Salgueiro, 2008), in theoretical and practical legacy of nursing sciences found a wide field of knowledge about humanization of care, built by different schools, in particular the definition of nursing and self-care deficit theory of nursing school the needs; the model of relationship person-to-person interaction's school; the model of unitary human beings and human becoming theory of unit human being school; the theory of diversity and universality of cultural care and the philosophy and science of the care.
The same authors mention that health professionals understand the true dimension of human suffering, when they enter the intimacy of the patient, due to the needs of the treatment, seeking to treat the patient as a human being, and conducting the procedure at the height of human dignity (Simões, Rodrigues & Salgueiro, 2008). However, not even health care professionals, caregivers, they always manage to be immune to the trend of devaluation of the human factor, *despite the current policy in that the amount exceeds the quality, I think we can still maintain privacy and individuality of the patient as a person, with much mutual effort we can achieve a higher level of quality of care* (E4).
In Portugal, the results of an investigation (Carvalho, 1996) on the theme "humanism and nursing", show a crisis at this level of performance, the loss of the holistic view of the patient, by the installation routine over the years of the nurse action and the progressive shortages in communication/relationship, going to meet the reported by the participants, to the point that *in the current economic climate, the numbers have a great weight and quality starts losing ground* (E6).

In Brazilian society, in order to meet the population's health needs, the Unified Health System (SUS) was created, guided by, among others, the principles of integrality of care, universality of access, search for equity and incorporation of new knowledge and practices (Marin, Storniolo & Moravcik, 2010). In this sense, the National Policy of Humanization is a new model of attention, imposing to the health professionals the co-responsibility for the improvement of humanization (Ministry of health of Brazil, 2006).
In a study that aimed to know the meaning that nursing professionals attach to the term "humanization" and see how the employ clinical practices, the humanization also called the virtues is evidenced primarily by the care. Take care refers to feelings such as love, friendship and healing (Collière, 2003). It can be said, then, that healing does not occur solely by technical knowledge, but especially by the universal sense of friendship and love, expressed in the care. So, leave to care for would be to go against human nature and become mechanistic only. What seems to occur is the gradual oblivion of this humanity. Arises, then, the neologism "humanization" to face the process of dehumanization. Soon, "humanization" or "humanized" care suggest a way to soften the consequences of the care system itself. In this sense, *the humanization is only achieved if are humanized care ... I think that despite all the ups and downs for a great effort on the part of nurses in care taking into account individuality of patients* (E6).
It is appropriate to point out that the humanization of care in haemodialysis units passing through the respect for the individuality of the person, at the same time raises a lack of holistic person, extrapolating the physical understanding of the disease and contemplating the psychological, social and spiritual aspects that, directly or indirectly, influence the health-disease process. Health professionals, as actors who stay too long with the patient, having as object of care work, which seeks to establish links, build relationships and get to know each other, must be agents in health promotion and boosters in the emotional well-being of patients in dialysis, so that they offend the disease process, as well as the treatments in a more positive perspective.
Health care should be provided humane and holistic and in the light of an integrated approach, including emotional care, more comprehensive and personalized to your patients, glimpsing a quality assistance (Corbani, Brêtas & Matheus, 2009).
The humanization can and should be done through words of affection, comfort and safety, during the numerous interventions. A special case is not required to provide a humanized, just optimize the time and offer respect for difference of each patient to ensure quality in routine procedures.

Communication
In a study that aimed to enhance communication as a basic tool in the humanized care process, it should be noted that communication is inherent to human behaviour and permeates all actions in the performance of their duties (Morais, Costa, Fontes & Carneiro, 2009), *the essence of caring in nursing is in communicating* (E6).
Etymologically, the term communicate comes from the Latin *comunicare* and means *put in common*. So, communication can be understood as a process of exchange and understanding of messages sent and received, from which people perceive and share the meaning of ideas, thoughts and purposes.
Communication involves interpersonal competence in interactions and is the basis of the relationship between human beings, besides being a vital and reciprocal process able to influence and affect people's behavior.

The communicative act, such as interactive and interpretive phenomenon, reveals the relationship required between human beings, since it is from the communicational process we share experiences, anxieties and insecurities while we satisfy our needs while beings of *insufficient patient relationship is a very demanding patient Kidney in the various facets of its pathology, the extent of tieing-in of an invasive technique several times a week the abrupt fluctuations in physiological terms, the uncertainty of the future, compounded with all the complications of technique and the natural revolt, lead nurse having to develop the communication in order to be able to provide any welfare to these patients* (E6).
The communication sets up a crucial factor in understanding the experienced by the people. It is essential for nursing care, in order to discern better patient care, which is experiencing feelings like anxiety and stress arising from the process of disease, being a fundamental tool for integral care and humanized because, through it, it is possible to recognize and accommodate the needs of the patient (França, Costa, Lopes, Nóbrega & França, 2013).
At the hospital, more precisely in hemodialysis units, communication allows a genuine care to the patient and not a simple treat, because allows this externalize your requirements in the search for solutions, with an emphasis on their individuality, promoting interpersonal relationship as proposal to minimize the process of depersonalization experienced by being hospitalized. From comprehensive care, you should understand the human being as a biological, psychological, social and spiritual and not be fragmented into various physiological systems.
Communication is the central axis in the act of caring for and handle, and should be considered not only as a humanizing act, but also as one of the deciding factors, along with the competence, efficiency and effectiveness of a specific quality of health service, as reported by the participants indicates to mention that many times the capacity of the rooms makes the communication with the patient and other health professionals *, hemodialysis room is packed which makes it impossible, in that space, have a conversation with the patient that allows complete privacy* (E5 and E6).
Currently therapeutic communication is a key aspect in the autonomous interventions of nurses, constituting a powerful and decisive in the process of care (Morais, Costa, Fontes & Carneiro, 2009). In this sense, health-care professionals to highlight their behaviors, taking into account the privacy of patients on regular dialysis program, have a duty to intervene in order to establish a relationship of trust and empathy considered essential for the creation of contexts, in which health professionals can actively interact with patients to explore their needs , developing strategies to maximize privacy in care units (Moura, 2006) and intersect, care routines requiring changes in own paradigm of health and in the dynamics of the work, in addition to reflections on personal and professional values (Ferreira, Gozzo, Panobianco & Santos, 2015).
Stress that the appreciation of hemodialysis care privacy and its elements is common in lack of the different participants of the study, being recognized its importance as an indicator of excellence in health care.
As limitation, considered the reduced sample size, caused by saturation of data the interviews conducted at different professional categories (nephrologists, nurses and assistants).
The study stand out alerts, opening up new guidelines for further investigation so that the understanding of the phenomenon may contribute significantly to nursing and the privacy concept incorporates the same importance in daily care practice, like any other nursing care considered fundamental.

CONCLUSIONS

The speeches brought by health professionals working in the hemodialysis units unveil focuses attention on the preservation of the privacy of care in hemodialysis, in their care practices, translated through the dimensions, physical space, body exposure, humanization of care and communication.
For the participants, the physical space dimension emerges as a relevant property in the privacy of hemodialysis care, claiming an architectonic structure conducive to privacy care, referring to the importance of the application of the consigned in the technical recommendations and the legislated. This placement of professionals, help to realize the exhibition body dimension, valued as display of intimacy and condition only to the person who experiences it.

In sequence, it is urgent to demand attention, to the dimension humanization of the care that complements the sense of the dimensions physical space and exposure of the body. The harmony that stands out in the sequence of dimensions reinforces what nursing patrimony advocates and peculiarizes it as a discipline.
Of the findings in the context of the care of privacy in dialysis stands out dimension of communication, which orients to the contextual properties of interaction in the care. This dimension calls for a climate of emotional security and mutual trust, regarded as essential in the care of privacy in hemodialysis.

Questioning the practices of health professionals about the preservation of the patients privacy on a regular dialysis program, are valued foci of attention that by their nature and following concerns in invoke.

Respect for the individuality and privacy are assumed by the professionals of health as a basic human need to be promoted and their preservation represents a careful relevant to guarantee respect for patients, compared with foci of attention considered in physical space dimension, exposure of the body, in the humanization of care inherent and underlying communication.

This success would be worthy of greater discussion and questioning about the preservation of the privacy of care in hemodialysis, constituting themselves as public policy of national scope and demarcating its uniqueness compared to other health policies. Not infrequently, the policies are constructed by induction of the incipient State and with understanding to the social actors with regard to their guidelines and strategies. Generally, it is expected that their regulatory frameworks are appropriate and faithfully carried out. Discuss the understandings built between policy makers and agents of policies would be a fertile path, but would object to other research.

The option for the hemodialysis units private scenarios of Portugal, although no evidence of prejudice to the study, we took it as limitation by enlargement to hemodialysis units public contexts.

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QUALIDADE DO AR INTERIOR EM GINÁSIOS - ESTUDO DE CASO NO MUNICÍPIO DE COIMBRA

INDOOR AIR QUALITY IN GYMS - A CASE STUDY IN THE COUNTY OF COIMBRA

CALIDAD DEL AIRE INTERIOR EN LOS GIMNASIOS - ESTUDIO DE CASO EN EL MUNICIPIO DE COIMBRA

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RESUMO

Introdução: o aparecimento da qualidade do ar interior (IAQ) como ciência aparece nos anos 70 devido à crise energética com a consequente construção de prédios particulares. Esta visão só ganhou alívio mundial devido à descoberta de que uma diminuição nas taxas de troca de ar neste tipo de edifícios foi a principal causa de aumento da concentração de poluentes no ar interior.

Métodos: O presente estudo caracteriza-se por ser de coorte de nível II, observacional e transversal. A amostra foi constituída por 3 ginásios de Coimbra e por 7 trabalhadores /. Para atingir esse objetivo, houve uma avaliação analítica dos parâmetros físicos e químicos e preenchimento de questionários pelos trabalhadores.

Resultados: Em relação aos resultados obtidos dos parâmetros avaliados, é possível concluir que os PM 10 (Diâmetro de Partículas de 10 mg / m3), os VOCs (Compostos Orgânicos Voláteis) e a Umidade Relativa apresentaram valores de risco relativos à saúde dos trabalhadores.

Conclusões: Os dados coletados, mostram a relevância dos estudos sobre a qualidade do ar para garantir no futuro ações preventivas de uma melhor qualidade de vida para todos.

Palavras-chave: Qualidade do Ar Interior; Parâmetros ambientais físico-químicos; Saúde pública.

ABSTRACT

Introduction: The appearance of the Indoor Air Quality (IAQ) as a Science appear in the 70's due to the energy crisis with consequent construction of private buildings. This vision only gained worldwide relief because of the discovery that a decrease in rates of air exchange in this type of buildings was the main cause for air increased pollutant concentration in the indoor air.

Objetives: To evaluate the IAQ regarding the applicable legislation in gyms.

Methods: The present study is characterized by being of level II, observational and cross-sectional cohort.

The sample consisted of 3 gyms Coimbra and by 7 workers/. In order to achieve this objective, there was an analytical assessment of both physical and chemical parameters and filling questionnaires by the workers.

Results: Regarding the obtained results of the evaluated parameters, it is possible to conclude that the PM_{10} (Particulate Matter diameter of 10 mg/m^3), the VOC's (Volatile Organic Compounds) and Relative Humidity presented risk values concerning workers health.

Conclusions: The data collected it was possible to verify the importance and relevance of the studies in the future to ensure a better quality of life for all.

Keywords: Indoor Air Quality; Physical-Chemical Environmental Parameters; Public Health.

RESUMEN

Introducción: La aparición de la Calidad del Aire Interior (IAQ) como Ciencia aparece en los años 70 debido a la crisis energética con la consecuente construcción de edificios privados. Esta visión sólo obtuvo un alivio mundial debido al descubrimiento de que una disminución en las tasas de intercambio de aire en este tipo de edificios fue la principal causa de aire aumentado la concentración de contaminantes en el aire interior.

Objetivos: Evaluar la IAQ sobre la legislación aplicable en los gimnasios.

Métodos: El presente estudio se caracteriza por ser de nivel II, observacional y transversal.

La muestra consistió en 3 gyms Coimbra y en 7 trabajadores /. Para lograr este objetivo, se realizó una evaluación analítica de los parámetros físicos y químicos y de los cuestionarios de los trabajadores.

Resultados: Respecto a los resultados obtenidos de los parámetros evaluados, se puede concluir que los PM 10 (Diámetro de Partículas de 10 mg / m3), los COV (Compuestos Orgánicos Volátiles) y la Humedad Relativa presentan valores de riesgo para la salud de los trabajadores.

Conclusiones: Los datos recogidos muestran la importancia y relevancia de los estudios para asegurar en el futuro una mejor calidad de vida para todos.

Palavras-clave: Calidad del Aire Interior; Parámetros físico-químicos ambientales; Salud pública.

INTRODUCTION

In the past, the purpose of building a habitation was only to provide necessary conditions for man, so that he could develop activities of their daily life. However, time has changed and knowledge concerning the structure of buildings has been improved, in particular themes such as safety, comfort, protection from natural causes, among others. However with this trend, new challenges have emerged regarding energy consumption, subsequently causing the Indoor Air Quality (IAQ) to be placed aside Carmo & Prado 1999).
This study aimed to evaluate the IAQ regarding chemical parameters such as CO (carbon monoxide), CO_2 (carbon dioxide), $PM_{2.5}$ (Particulate Matter diameter 2.5 mg/m3), PM_{10}, VOC's , HCHO (Formaldehyde) and physical parameters such as the Relative Humidity (%) and Air Temperature (°C) in 3 gymnasiums located in the district of Coimbra.

1 - THEORETICAL FRAMEWORK

Today, although many challenges are still being confronted, environmental concern has been growing and the impact that IAQ has on health and well-being of people has become a subject of study in the field of Public Health (Costa & Costa, 2006).
In this sense and according to the World Health Organization (WHO), an acceptable IAQ presumes that *"the physical nature and air chemistry that is breathed by the occupants of a building produces a complete well-being, mental, physical and social and cannot cause absenteeism, illness or infirmities"* (Marques, 2013).
Nowadays there is a continuous increase of scientific evidence that the contaminated air which is present inside a building may be more danger that the contaminated air presented outside of that same building, even in industrialized areas (Ramos, 2013). This information becomes extremely important due to the fact that a large number of people (80% to 90%) spend most of their time in buildings and consequently exposed to various existing pollutants (Schirmer, Pian, Sílvia, Szymanski, & Gauer, 2011).
Environments showing a low IAQ are characterized by having a high concentration of pollutants that are harmful to the occupant's health, which are inserted into chemical parameters. These environments combined with an increase in humidity and temperature (physical parameters) can lead to the appearance of a large number of fungi and bacteria (biological parameters) (Fraga et al., 2008).
These parameters have become a study base regarding the IAQ since these can be found, for example in cleaning products, materials and/or damaged equipment and polluted, due to human presence, their activities and poor conditions of ventilation and air renewal (Schirmer et al., 2011); (Alves, 2012).
Due to the multiple pollutants that can be found in a building, the WHO has classified *"Sick Building Syndrome"* (SBS) as a danger to public health. SED is used to mention situations in which the residents of a building show symptoms harmful to health and comfort. These symptoms arise associated with the residence time of an individual inside the building, but no pathology or effect can be identified. Symptoms such as headache; dizziness; nausea; apathy; somnolence; tiredness and/or weakness; among others, depend on the concentration and exposure to short or long term to a given pollutant (Marques, 2013), (Brickus, & Neto, 1999); (Madureira et al., 2015).
The IAQ is directly related to the ventilation conditions in buildings. In this way, a verification and/or repair of the ventilation system is required, consequently improving the quality of air in any type of building (Robertson, 2016).
With regard to the IAQ in sports facilities, few studies are known which implies greater attention in these establishments, since these areas are frequented by many people regardless of their age and purpose for which they train. Staying in these locations can differ from a few hours to every day in the case of the monitors (Marques, 2013). In this sense it is imperative to carry out a continuous assessment of these areas, in order to ensure the best possible conditions for the occupants of these spaces.

2 - METHODS

This study was conducted in the academic year 2015/2016 and the data collection was performed between days 21 December 2015 until 20 January 2016. It was conducted in three gyms located in the county of Coimbra, which were close to transport routes. This study was presented as Level II, observational type and cross-sectional cohort type.

2.1 – Data Collection Instruments and Procedures

This study was based on data collection inside and outside the gym, having collected 9 samples in each, along with the preparation of a questionnaire given to the workers of each establishment. With this in mind, the study showed two moments of investigation. Initially referring the collection of values for the CO, CO2, $PM_{2.5}$, PM_{10}, COV's, HCHO, Relative Humidity and Air Temperature; A second stage which involved the collection of information regarding the health of workers in each establishment by completing a questionnaire.
In particular, the study sample consists of three gyms located in the county of Coimbra and the monitors that showed willingness to participate in this study. Regarding the fulfillment of the questionnaire, the sample was represented by 7 employees.

The total area was recorded, the type of ventilation, and other characteristics of critical areas, with regard to the building conditions of each gym. For these rooms, the gym A has an area of 70 m^3 and 0 ventilation equipment, gym B has an area of 370 m^3 and 0 of ventilation equipment and gym C has an area of 50 m^3 and 3 ventilation equipment.

According to the first moment of evaluation, the parameters mentioned above were evaluated according to an analytical data collection respecting all procedures for a good assessment of the site under study. Each measurement was carried out using four monitoring equipment of Air Quality (Formaldemeter - Model HTV-M - Formaldehyde, Lighthouse - Model 3016 - $PM_{2.5}$ and PM_{10}, Q-Track - Model 8554 - CO, CO_2, Relative Humidity and Air temperature; PhotoVac - Model 2020 Combo Pro - COV's). The place where data collection was performed was based on the worst possible conditions present, according to time and room that presented a greater number of people, and its exterior allowing the collection of variations regarding the concentrations of pollutants in the study.

The measurement of chemical parameters varied regarding the duration of the measurement, since we used two different devices (Lighthouse - Model 3016, Q-Track - Model 8554). To assess CO, CO_2, humidity and air temperature an average of 5 minutes was spent and to evaluate PM_{10} and $PM_{2.5}$ about 15 minutes, both inside and outside. Note that all measurements were done outside after performing the evaluation inside each gym.

As discussed above, an assessment was conducted on the outside and inside the rooms where a larger number of people were presented (in the evening) in all gymnasiums. The devices were placed in an area where the environment presented being more unfavorable for the people, in the area around their airways (between 1m and 1.5m height at least 1m apart walls). In the case of the Outdoor Air Quality (OAQ), the devices were placed near the entrance of the gyms and on the basis of the same height and distance of the inner walls.

According to Decree No. 353-A/2013 of December 4th, the maximum concentration of each pollutant presents a protection threshold. In the case of CO, a limit of 10 mg/m3 (9 ppm), CO_2 of 2250 mg/m^3 (1250 ppm), $PM_{2.5}$ of 25 ug/m^3, PM_{10} of 50 ug/m^3, VOCs 's of 600 ug/m^3 and the formaldehyde of 100 ug/m^3 (0,08 ppm) (Portugal, 2013).

In the case of physical parameters, the protection threshold for the air temperature varies according to the season. Since this study was conducted in winter, the reference value is 20ºC. Regarding Relative Humidity normal values are between thresholds of 30% and 70%.

All data collected, whether interior or exterior, was recorded by hand in a notebook, due to the fact that some equipment lacked any way to store the values obtained.

At the second assessment, the delivered questionnaires are related to the health of the respondents, with questions concerning the number of years in the said profession, the workload, rating their level of work (between monotonous and stimulating), health conditions (had any symptoms or diseases that could be related to the activity performed) and finally concerning their smoking habits, whether or not they presented it. Finally it should be noted that all data collected for the present statistical study were based on curricular and academic purposes and not for profit, without any economic or commercial interest associated. The measurements made and the questionnaires carried out had the consent of the directors of each gym after being informed about the study's objectives, always keeping anonymous the data and any references to the gym.

2.2 – Statiscal analysis

Statistical analysis of the data collected was performed using the IBM SPSS Statistic software version 23.0 for Windows 8.1. Using this software it was possible to use descriptive statistics, such as location measures (mean) and dispersion (standard deviation). The tests used were the t-Student test for independent samples, t-Student test for one sample, Kruskal-Wallis test and the Independence X^2 test. For statistical inference it was possible to establish a 95% confidence level for a random error less or equal to 5%.

3 - RESULTS

Regarding the presented sample, 3 gyms were located in the county of Coimbra, where it was performed various sport activities, such as cycling, zumba, fitness, among others, in a room where all participants could train.

Due to the contribution of workers, it was found that, of the seven individuals who completed the questionnaire, 42.9% were male (3 subjects) and 57.1% were female (4 individuals). With regard to the age of respondents, the average was 28 years (standard deviation = 4.756), the maximum age was 36 years and the minimum age is 21 years. In the case of qualifications it was possible to point out that 71.4% of respondents had a bachelor degree (5 subjects).

After data collection and statistical analysis, it was possible to proceed to compare the mean values estimated from concentrations obtained from both chemical and physical parameters of the air from gyms in study with the protection thresholds indicated in the Decree mentioned above (Table 1).

Table 1: Results of the chemical air parameters

	N	Mean	Standard Deviation	Protection Threshold	Mean Difference	p-*value*
CO (mg/m^3)	18	9,300	14,618	10 mg/m^3	-0,700	0,841
CO_2 (mg/m^3)	18	1232,722	1561,164	2250 mg/m^3	-1017,278	0,013
$PM_{2.5}$ (ug/m^3)	18	24,351	8,566	25 ug/m^3	-0,649	0,752
PM_{10} (ug/m^3)	18	83,027	41,616	50 ug/m^3	33,027	0,004
COV´s (ug/m^3)	18	616,111	259,686	600 ug/m^3	16,111	0,769
Formaldehyde (ppmv)	18	0,064	0,259	0,08 ppmv	-0,016	0,802
Maximum Formaldehyde (ppmv)	18	0,082	0,329	0,08 ppmv	0,002	0,978
Relative Humidity (%)	18	85,039	11,473	30%-70%	15,039	<0,0001
Air Temperature (ºC)	18	13,344	2,747	20ºC	-6,656	<0,0001

Test: t-Student for 1 sample

In the pollutants, it was found that the average concentrations of CO, CO_2, $PM_{2.5}$, Formaldehyde and Air Temperature were presented below the danger threshold for the users of gymnasiums.
Certain parameters showed values higher than the limit threshold stipulated by law, such the case of PM_{10}, VOC's and Relative Humidity, whose difference presents a risk to the health of the participants during their physical activity in gyms of the study. Among the parameters with a high significant impact on the health of occupants of gyms, it was the pollutant PM_{10} ($p = 0.004$) which demonstrated a greater discrepancy in which the values exceeded on average 33.027 ppm over the limit established by law, which was 50 ug/m^3.
It was then performed an analytical evaluation for the internal and external environment in order to check which one presented a higher concentration of pollutants studied (Table 2).

Table 2: Results of the chemical indoor and outdoor air parameters

N=9	Measurement Place (Indoor and Outdoor)	Mean	Standard Deviation	p-*value*
CO (mg/m^3)	Indoor Outdoor	11,322 7,278	16,202 13,503	0,595
CO_2 (mg/m^3)	Indoor Outdoor	2222,778 242,667	1723,737 48,757	<0,0001
$PM_{2.5}$ (ug/m^3)	Indoor Outdoor	25,101 23,600	11,074 5,659	0,930
PM_{10} (ug/m^3)	Indoor Outdoor	89,899 76,154	34,903 48,537	0,070
COV´s (ug/m^3)	Indoor Outdoor	563,333 668,889	291,595 228,169	0,507
Formaldehyde (ug/m^3)	Indoor Outdoor	0,129 0,000	0,365 0,000	0,146
Maximum Formaldehyde (ug/m^3)	Indoor Outdoor	0,164 0,000	0,464 0,000	0,146
Relative Humidity (%)	Indoor Outdoor	85,100 84,978	16,134 4,406	0,093
Air Temperature (ºC)	Indoor Outdoor	15,133 11,556	2,055 2,148	0,007

Test: t-Student for independent samples

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With these results it was found that there were significant differences in CO_2 and air temperature. However, although it was not observed differences between the place (inside/outside) with respect to PM_{10} ($p = 0,07$), it was possible to state that the indoor revealed, on average, higher values marginally significant when compared to exterior locations.
From the average of CO_2, this has a much higher concentration in the indoor environment compared to measurements outside the gyms. In the other parameters it was not possible to verify significant differences.
Then it was intended to evaluate the pollutants from the spaces (indoor and outdoor) and verify if these varied depending on the various gyms (Table 3).

Table 3: Results of the chemical air parameters in gyms

N=6	Gym A		Gym B		Gym C		Total		p-value
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	
CO (mg/m^3)	2,400	0,486	3,767	1,446	21,733	21,090	9,300	14,618	0,086
CO_2 (mg/m^3)	485,500	252,969	977,833	839,944	2234,833	2358,824	1232,722	1561,164	0,573
$PM_{2.5}$ (ug/m3)	25,425	7,066	21,293	6,132	26,333	12,026	24,351	8,56	0,434
PM_{10} (ug/m3)	72,362	24,628	87,335	51,684	89,383	49,026	83,027	41,616	0,834
COV´s (ug/m3)	786,667	203,928	693,333	2,262	368,333	144,141	616,111	259,686	0,003
Formaldehyde (ug/m^3)	0,000	0,000	0,000	0,000	0,193	0,445	0,064	0,259	0,120
Maximum Formaldehyde (ug/m^3)	0,000	0,000	0,000	0,000	0,247	0,566	0,082	0,329	0,120
Relative Humidity (%)	86,200	3,501	80,183	18,706	88,733	6,251	85,039	11,473	0,567
Air Temperature (ºC)	11,483	2,272	14,050	2,933	14,500	2,353	13,344	2,747	0,141

Test: t-Student for independent samples

It was found that regarding the assessment by gyms, these didn´t present significant differences in the parameters studied except for one, the VOC's, which showed different values being higher in gyms A and B and lower in the gym C relative to the limit. However it is also important to note that CO_2 has values close to those stipulated by the legislation in the gym C.
However it is noteworthy that although there may be differences when compared each gym relative to environment (indoor and outdoor), it may not be the same when separating each environment. With this in mind a separation of each environment and an analysis was proceeded to see if those same differences existed (Table 4).

Table 4: Results of chemical parameters of indoor air in each gym

N=3	Gym A		Gym B		Gym C		Total		p-value
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	
CO (mg/m^3)	2,233	0,208	4,433	1,050	27,300	21,700	11,322	16,202	0,061
CO_2 (mg/m^3)	711,000	11,358	1719,000	339,080	4238,333	1366,522	2222,778	1723,737	0,027
$PM_{2.5}$ (ug/m3)	26,117	7,764	17,400	4,918	31,787	15,764	25,101	11,074	0,193
PM_{10} (ug/m3)	90,000	22,805	68,450	2,948	111,247	54,502	89,899	34,903	0,430
COV´s (ug/m3)	826,667	2,715	603,333	73,711	260,000	1,277	563,333	291,505	0,032
Formaldehyde (ug/m^3)	0,000	0,000	0,000	0,000	0,387	0,618	0,129	0,365	0,105
Maximum Formaldehyde (ug/m^3)	0,000	0,000	0,000	0,000	0,493	0,786	0,164	0,464	0,105
Relative Humidity (%)	84,933	0,924	76,233	28,205	94,133	2,108	85,100	16,134	0,097
Air Temperature (ºC)	12,700	1,044	16,100	1,473	16,600	0,346	15,133	2,055	0,064

Test: t-Student for independent samples

When comparing gyms indoor environment it was found that almost all the parameters showed no significant differences with the exception of CO2 and VOC's, however some are close to present significant differences such as CO, air temperature and relative humidity (Table 5).

Table 5: Results of chemical parameters of outdoor air in each gym

N=3	Ginásio A		Ginásio B		Ginásio C		Total		p-value
	Mean	Standard Deviation	Mean	Standard Deviation	Média	Standard Deviation	Média	Standard Deviation	
CO (mg/m^3)	2,567	0,681	3,100	1,670	16,167	23,412	7,278	13,503	0,871
CO_2 (mg/m^3)	260,000	85,458	236,667	28,361	231,333	26,539	242,667	48,757	0,967
$PM_{2.5}$ (ug/m3)	24,733	7,945	25,187	4,934	20,880	4,880	23,600	5,659	0,587
PM_{10} (ug/m3)	54,723	7,931	106,220	74,829	67,520	40,054	76,154	48,537	0,288
COV´s (ug/m3)	746,667	159,478	783,333	313,422	476,667	20,817	668,889	228,169	0,088
Formaldehyde (ug/m^3)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Maximum Formaldehyde (ug/m^3)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1,000
Relative Humidity (%)	87,467	4,997	84,133	5,698	83,333	2,401	84,978	4,405	0,430
Air Temperature (ºC)	10,267	2,715	12,000	2,594	12,400	0,700	11,556	2,148	0,561

Test: t-Student for independent samples

On the outside environment it was possible to verify that all parameters did not show significant differences, however one of the parameters is close to show significant differences, in particular VOC's.
Regarding the health of the workers an analysis was made in order to verify if the malaise that workers had could be related to the fact that they carry out activities outside the gym or not.

4 - DISCUSSION

Improving the quality of life of a population/community it is increasingly becoming a factor aggregated to the air quality levels that each person breathes. Thus the air quality can affect our well-being, influencing our present and future thus becoming one of the main risk factors for public health (Santos, 2008); (Ferreira & Cardoso, 2013).
After analyzing the results it was possible to verify that in the average values, obtained in 3 gyms concerning chemical and physical parameters of IAQ, most of the parameters were not excessive when compared to the threshold values, except three parameters PM $_{10}$, VOC's and Relative humidity, which exceeded the limit (50 ug/m3 600 ug/m3, a range of 30% -70% respectively).
Given that a large percentage of people spend most of the time indoors, the IAQ is fundamental to the health of those same people. Interior spaces usually have little air exchange rate when comparing with the outside environment, thus there is a tendency to accumulate harmful pollutants. Due to this trend, it is important to monitor the indoor air quality with respect to maintenance, inspection and possible recovery of IAQ (Barbosa, 2012).
Nowadays people are more sensitized regarding IAQ, associating some discomforts that can be felt to the poor indoor air quality. It is known that the presence of living beings (humans and animals), all types of equipment (ventilation) and materials (curtains, furniture, etc.) which are in the buildings may be possible sources of contamination (Sodré, Tórtora, & Corrêa, 2014).
According to the analysis presented in Table 2 it is possible to see that the indoor air has higher values than the air outside. Regarding the parameters that had values above the limit threshold set by legislation, they become harmful and have many complications.
Although CO_2 did not show a mean higher than the protection limits, it is important to refer its properties because of its potential both as a way to evaluate IAQ as of dangerous.
Carbon dioxide, being at room temperature, is characterized by being colorless, odorless and non-flammable resulting from metabolism of building occupants and other sources such as combustion appliances (oven, fireplaces, boilers, etc.). Thus CO_2 is recognized as an indicator of ventilation rates and own assessment of IAQ. When performing minor tasks, people release about 0,3L/min of CO_2, varying the concentration depending on the size of the space, the time of day and also depending on the level of physical activity, leading to a minimum ventilation rate per person 10L/s in order to ensure good IAQ in buildings recommended by the ASHRAE Standard 62-1989. Very low concentration levels of CO_2 don´t present any kind of danger, but when it exceeds 30 000 ppmv, it can cause headaches, dizziness and even nausea (Santos, 2008); (Sodré et al., 2014).
The particulate material consists of condensed particles that are classified by diameter feature. It is known that the density, shape and particle size are harmful factors when they reach the lungs. The smaller it is the more dangerous it becomes to health. They can be found in many places such as in smoke of cars, the type of pipes isolation, carpets and in the ventilation system filters. High levels can cause symptoms such as allergy, irritation to the eyes and nose, coughing and breathing difficulties, bearing in mind that most dangerous particles may eventually cause asthma and/or bronchitis (Sodré et al., 2014); (Matos & Andrade, 2013).
The VOC's can contribute to tropospheric ozone formation and the destruction of the stratospheric ozone layer, which can be found in various sources inside a building such as carpets, paints and varnishes, cleaning agents, photocopiers, among others. Depending on the exposed concentration it can be more or less damaging, in other words, concentrations between 0.3 and 3 mg/m^3 may cause irritation, discomfort, and even stress. Amounts exceeding $25mg/m^3$ can cause other more dangerous symptoms such as respiratory irritation (Santos, 2008); (Sodré et al., 2014).
Regarding the relative humidity, this may result due to a poor control of the moisture levels, the amount of equipment, occupational density and also the possible inability of the building in terms of air exchange rates. High humidity values can lead to proliferation of microorganisms and even worse pollutant concentration. Symptoms that can be associated with moisture are the thermal discomfort, increased irritability, and further lead to loss of concentration of the occupants (Sodré et al., 2014).
Although the values found are above the threshold values, it is important to note that in all the studied areas there were means that could provide exchanges between the indoor and outdoor air.
The use of ventilation systems aims to renew air, consequently removal of pollutants and/or harmful particles generated by human activities or from used machinery and equipment. This measure has other advantages, such as ensuring good hygiene and good health to the building occupants favoring the comfort of the same, increasing the oxygen rate and still control the

humidity and temperature levels, contributing to the improvement of indoor air quality. However it should only be performed when the outdoor environment has good air quality (Schossler, Santana, & Spinelli, 2015; Barros, 2013).
Given the values found in respect of the parameters evaluated it can be seen that there is a possibility of risk to the health of occupants in gyms relative to the concentrations of PM_{10}, VOC's and Relative humidity.
When conducting physical activity it is necessary to pay attention to the type of exercise performed, frequency, time and even the intensity of it. These factors are directly related to energy expenditure in the body. Other associated aspects that can be highlighted are the type of diet, physical condition and morphology of the athlete. All these conditions influence the effort recovery time, the performance and concentration in which the activity is performed, especially if the exercise is of short duration and high intensity (Ramos, 2013; (Ferreira & Cardoso, 2013).
Information gathered from surveys has shown that most workers had symptoms such as fatigue, stress and perturbations of sleep/insomnia.
When the evaluation in gyms was performed, it was possible to observe some situations that can be improved, though they may be already legally enforceable. Thus, some recommendations are given.
In order to prevent the appearance of high pollutant concentrations, a good ventilation of spaces should be performed, thus creating a form of daily-ventilated either through mechanical ventilation equipment (insert clean air) or air conditioning equipment filtering the outside air when it has good air quality, either by opening windows and doors of the building, in order to ensure air changes.
Another measure goes through the habit of performing a proper cleaning of the space and maintenance of HVAC equipment in order to control the pollution parameters of indoor air. Taking this information into account it would be essential to prevent or eliminate, if possible, the appearance of signs regarding moisture and clean fixed surfaces and furniture so that there is no possibility of the dust.

CONCLUSIONS

In short, with the analysis carried out it is possible to verify that three of all parameters were indicated with values above the protection threshold, namely PM_{10}, VOC's and Relative humidity, therefore conclude that existed at the time of data collection a poor air ventilation, which caused an air saturation in the area. However other types of ventilation should be adopted to improve filtration and air cleaning that may eventually come from the outside contaminated air, or from the place itself and the people who attend it.
It should be noted that the study was conducted in winter and in a few days it was raining. Another important limitation is the small number of surveys conducted since each gym had few permanent workers.
Thus it is relevant the need for more studies in this area, regardless of the county, with a larger sample and respectively more employees willingly to respond more simple and direct questionnaires regarding their perception of the air they breathe indoors.
However it would be interesting to compare data collected in different seasons of the year in order to make the study more representative and the sample more significant thus making a most comprehensive study.
The development of IAQ area becomes, therefore, very important for environmental health because it includes the various professionals involved in this area that perform the most various activities. Thus it is necessary to intervene to prevent problems associated with IAQ in buildings, in order to contribute to a better level of comfort, well-being and health of its occupants, whether workers or people who attend this type of establishment.

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