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Association of television viewing with mental health and mild cognitive impairment in the elderly in three European countries, data from the MentDis_ICF65+ project

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ABSTRACT

Background: Time spent watching TV by Europeans has been calculated to be 22.1 h per week on average and it has shown to be correlated with a series of physical and mental problems in adults. Very little research is available in population over 65. This study aimed at evaluating the association between TV viewing and mental disorders and cognitive performance, taking into account the general physical activity level and socio-demographic characteristics in Europe.
Methods: Within the MentDis_ICF65+ study, a subsample of 1383 subjects aged 65–84 years were assessed by the Composite International Diagnostic Interview (CIDI65+) and the International Physical Activity Questionnaire (IPAQ) for physical activity evaluation. Time spent in watching TV was assessed through a self report instrument.
Results: Forty-three per cent of the total sample watched TV for 5–7 days a week for 2 or more hours every day. Females, people who lived alone, older subjects and those with lower education significantly watched TV for a longer time. Stepwise multiple regression showed statistically significant inverse correlation between Mini-Mental State Examination scores and TV viewing time ($p < 0.001$). Apart from a negative association with Major Depressive Disorder, no particular associations were found between TV viewing and psychopathological diagnoses.
Conclusions: Given the relationship of time spending watching TV with cognitive impairment, awareness should be raised about the possible negative effects of TV viewing on the elderly and programs to reduce TV viewing time should be set up.

1. Introduction

Television (TV) viewing is a common, widespread way of spending leisure time at all ages. Time spent watching TV by Europeans has lately been calculated to be 22.1 h per week on average (Nationmaster, 2009). In younger adults, TV viewing, frequently used as a measure of sedentary behaviour, has been correlated with a number of serious health risks, such as higher risk of obesity and type 2 diabetes mellitus in women (Hu, Li, Colditz, Willett, & Manson, 2003), and in men (Grontved & Hu, 2011; Hu et al., 2001), higher risk of obesity and cardiovascular diseases

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(Bowman, 2006; Fung et al., 2000; Jakes et al., 2003; Marshall, Biddle, Gorely, Cameron, & Murdey, 2004), neck and low back pain (Kuster, 2004), metabolic syndrome (Dunstan et al., 2005; Gao, Nelson, & Tucker, 2007; Wijndaele et al., 2009), atherosclerosis (Kronenberg et al., 2000), sleep problems (Basner & Dinges, 2009) and others (Dunstan, Howard, Healy, & Owen, 2012; Grontved & Hu, 2011).

In the young/adult sector of the population, TV viewing has also been associated with risk for mental health disorders. In a Spanish study, Sanchez and colleagues found an association between sedentary activities (watching TV and using the computer) and the incidence of mental disorders (Sanchez-Villegas et al., 2008). In a Scottish survey, Hamer et al. concluded that TV and screen-based entertainment were associated with poorer mental health scores in a representative population sample of adults (Hamer, Stamatakis, & Mishra, 2010). De Wit and colleagues report that, independently of physical activity amount, sedentary behaviours occur more frequently among persons with a mental disorder. In particular in this Dutch study, TV viewing was higher in people with dysthymia, panic disorder and agoraphobia compared to controls (de Wit, van Straten, Lamers, Cuijpers, & Penninx, 2011). Atkin, Adams et al. found a negative association between sedentary activities (including TV viewing) and mental health scores in women in the UK (Atkin, Adams, Bull, & Biddle, 2012). Finally, in an important longitudinal study, the English Longitudinal Study for Ageing, Hamer and associates found a cross-sectional and longitudinal association between TV viewing and depressive symptoms (Hamer, Poole, & Messerli-Burgy, 2013; Hamer & Stamatakis, 2013).

Furthermore, TV viewing has been linked to a possible increased risk of cognitive impairment. In the previously cited Longitudinal study, Hamer et al. found an inverse association between TV viewing and cognitive function levels (Hamer & Stamatakis, 2013). A 5-year longitudinal study in China found that watching television was associated with a higher risk of developing a cognitive impairment (Wang et al., 2006). Finally, another 6-years longitudinal study done in France found a negative association between time spent watching TV and executive functioning (Kesse-Guyot et al., 2012).

A recent review on the prevalence of sitting behaviour in people of 60+ years indicated that over 55% referred watching more than 2 h of TV daily. However, while the previously cited studies have mostly focussed on adults, little has been published on the effects of TV viewing on people over 65 years old (Kikuchi et al., 2013; Lucas et al., 2011). A recent review on the prevalence of sitting behaviour in of people of 60+ years indicated that over 55% referred watching more than 2 h of TV daily (Harvey, Chastin, & Skelton, 2013). Furthermore, all currently available data have been derived from single-country studies and no international or cross-national studies exist.

The present study aims at providing some further elements in order to understand how TV viewing relates with elderly mental health and cognitive performance across three European countries.

2. Methods

2.1. Sample

Data have been gathered as part of the MentDis_ICF65+ study, on “Prevalence, 1-year incidence and symptom severity of mental disorders in the elderly: Relationship to impairment, functioning (ICF) and service utilization” (MentDis_ICF65+) funded by the European Commission within the 7th framework program. Aims, design, and methods have been described in greater detail elsewhere (Andreas et al., 2013) and are only shortly reported here.

The MentDis_ICF65+ study is a multicentre research project designed to adapt existing diagnostic tools and questionnaires to the elderly, and then to gather data on the prevalence (cross-sectional phase) and incidence (longitudinal phase) of mental disorders in the general 65–84 years population across different countries of the European Union (Spain, Italy, UK, Germany) and two other related states (Switzerland, Israel). The sample was age- and gender-stratified and randomly selected.

Inclusion criteria were living in the defined catchment area, being aged between 65 and 84 years, having a sufficient level of corresponding language and a Mini Mental State Examination score indicating sufficient cognitive function (MMSE > 18, age and education adjusted). In this study we examined results from a subsample of 1383 subjects from three centres, Italy, Switzerland and Germany, where specific additional data on TV viewing and physical activity where gathered.

The sample consisted of 1383 subjects. There were 52.4% ($n = 725$) male, 47.6% ($n = 658$) female, mean age 72.5 (S.D. 5.69), 35.1% ($n = 486$) from Ferrara (Italy), 27.5% ($n = 380$) from Hamburg (Germany) and 37.4% ($n = 517$) from Geneva (Switzerland).

The majority of people interviewed were living with someone (overall 70.8%; 70.5% in Hamburg, 77.6% in Ferrara, 64.6% in Geneva, $p < 0.001$) while only 29.2% were living alone. The participants attended school for 10.3 years on average (10.3 in Hamburg, 8.8 in Ferrara and 11.8 in Geneva, $p < 0.001$) and most graduated from the last school they attended (88.7% overall 96.8%, in Hamburg, 88.4% in Ferrara, 83.2% in Geneva, $p < 0.001$). At the time of the interview the vast majority of participants were not working (94.7% overall, 97.9% in Hamburg, 97.0% in Ferrara, 90.3% in Geneva, $p < 0.001$).

2.2. Measurements

For the present analyses we used the data of the first wave (cross-sectional) of the MentDis_ICF65+ study. All participants underwent a global assessment during individual meetings either at their homes or at the local research structures between January and October 2011 and gave written informed consent for participation according to the local institutional Ethics Committees (Andreas et al., 2013). Such evaluation covered a wide range of physical as well as mental health aspects, socio-demographic data, physical activity, and TV viewing and was carried out both through semi-structured interview and self reported information.

2.2.1. Depressive and anxiety disorder diagnoses

Data on mental health were collected using a Computer Assisted Personal Interviewing (CAPI) version of the *Composite International Diagnostic Interview for the Elderly* (CIDI65+), the adjusted version of the CIDI (Haro et al., 2006; Kessler et al., 2004; Wittchen et al., 1991) and adapted by the study group to the particular social, cognitive and psychological abilities and needs of the elderly. The syndrome domains and sections, the translation and adaptation procedure and the psychometric assessment of the CIDI65+ are described elsewhere in more detail (Wittchen et al., 2014). Interviewers received extensive training before the start of the study and were monitored and supervised constantly during the data collection phase. The same procedure was followed in each centre and the same – translated - version of the CIDI 65+ was used. The interview covers several mental health problems including anxiety disorders and affective disorders according to the Diagnostic and Statistical Manual for Mental Disorders, DSM-IV criteria (APA, 2000; Wittchen, 1994) and leads to specific diagnoses according to pre-defined diagnostic algorithms taking also into account diagnostic hierarchy rules and possible organic exclusions. The present study focused on depressive disorders such as Dysthymic disorder (with hierarchy), Major depressive disorder (MDD), as well

as anxiety disorders, including Agoraphobia, Generalized anxiety disorder (GAD6 - DSM-IV), Social phobia (lifetime), any Simple phobia, Panic disorder. In a previous similar work by de Wit et al. (2011) the timeframe chosen for presence of diagnosis was the 6 months preceding the study. For comparability purposes, as our study only had current (one month), one year and lifetime available, we chose to select the one-year timeframe for inclusion as closer to the 6-months criterion.

2.2.2. Cognitive impairment

Cognitive functioning was gathered through the Mini Mental State Evaluation (MMSE). This is a short tool (30 items with an average delivery time of 10 min) normally used for cognitive impairment screening and severity evaluation (Folstein, Folstein, & McHugh, 1975). It needs to be adjusted for age and education (O'Connor, Pollitt, Treasure, Brook, & Reiss, 1989) and even though it does not provide a definitive diagnosis for dementia, it has sufficient psychometric properties to be considered useful to generally investigate cognitive functioning (Crum, Anthony, Bassett, & Folstein, 1993; Tombaugh & McIntyre, 1992).

In this study people with severe cognitive impairment were excluded. People were considered as having a Mild Cognitive impairment with a 18-26 MMSE score, while with 27–30 score they were considered with no cognitive impairment.

2.2.3. Television viewing

Time spent watching TV in the past week was collected by a self report instrument. Similarly to the questions regarding physical activity, the subjects were asked to indicate on how many days they watched TV during the previous week (0–7) and to indicate for how long on average each day by choosing between six options (<10 min, 10–30 min, 30 min-1 h, 1–2 h, 2–3 h, >3 h). The weekly hours TV viewed number was calculated by multiplying the average time spent daily (e.g. for the "1–2 h" category we considered 150 min) by the number of days (range 0–1260 min per week).

2.2.4. Covariates

Analyses were corrected for possible confounding variables, specifically gender, age, level of education (high: >13 years, intermediate: 9–12 years, low: <8 years), employment status (unemployed/retired, employed), financial situation (very good, good, just enough or very low), living status (alone, not alone), study centre (Ferrara, Hamburg, Geneva). Physical activity levels were gathered through the self-report International Physical Activity Questionnaire (IPAQ), using the short last 7 days telephone version for time saving purposes, even though it was used during the face to face interview (Craig et al., 2003; Hallal & Victora, 2004). This simple questionnaire gathers information on the time that people spent doing three different types of physical activities (vigorous, moderate and walking) during the previous week. The original version included a fourth area related to the sedentary behaviour that included time spent watching TV. For the purposes of our study the question was slightly modified to separate TV viewing time from the time spent in other sedentary behaviours (meal, reading, travelling by car and so on).

In order to facilitate completion by the elderly, instead of asking to recollect for how many hours and minutes they performed each type of activity on average per day, they were asked to choose between six options (<10 min, 10–30 min, 30 min-1 h, 1–2 h, 2–3 h, >3 h). In fact less than 10 min is considered not sufficient physical activity (Sun, Norman, & While, 2013), more than 3 h can be considered as a very high level of physical activity for the 65–84 age group.

Based on such data it was possible to compute an overall energy expenditure estimate in Metabolic Equivalent Total (MET)-units. This is a standard and comparable way to measure the energy "cost" of physical activities: it allows to reduce to a single number different types of activities (Sedentary-Behaviour-Research-Network, 2013). The Total weekly MET minutes were derived from multiplying duration of activity times frequency of activity times MET intensity, as provided within the IPAQ guidelines (IPAQ-Group, 2005). Low physical activity has been considered when total weekly MET were lower than 600, moderate between 600 and 3000, high levels when higher than 3000.

Physical activity and sedentary behaviour can be influenced also by the level of functioning of the person (the inverse concept of Disability (WHO, 2002)) and by their physical health. Therefore we included the WHODAS II simple sum score derived from the 12-item self-administered version of the WHO Disability Assessment Schedule II (WHODAS-II) (Sousa et al., 2010), used to assess level of functioning in relation to cognition, mobility, self-care, getting along, life activities and participation. Furthermore we included the self-reported number of diagnosed medical illnesses in the previous year.

2.3. Statistical analyses

IBM SPSS 20.0 was used to perform all statistical analyses. We computed TV viewing outcomes and covariates in relation to the depression and anxiety diagnosis (control subjects with no depression nor anxiety, depression alone, anxiety alone, comorbid anxiety and depression) and to cognitive functioning (mild cognitive impairment, no cognitive impairment) and tested differences with χ^2 analyses or *T*-test where appropriate. Stepwise multiple regression analyses, adjusted for covariates (as described above: gender, age, level of education, employment status, financial situation, living status, study centre, physical activity level (weekly MET total), Level of Functioning (WHODAS II score) were performed to test the association between TV viewing as dependant variable (between 0 and 1260 min per week)) and cognitive impairment rated as continuous MMSE score, as well as diagnosis of depression/anxiety as independent variables, rated as binary variable (0 = control, 1 = case). We analysed diagnoses both as general diagnoses and including the specific diagnoses (Dysthymic disorder (with hierarchy), Major depressive disorder (MDD), Agoraphobia, Generalized anxiety disorder (GAD6 - DSM-IV), Social phobia (lifetime), Any simple phobia, Panic disorder).

3. Results

The sample included a total of 1383 subjects, 166 had to be excluded since the questionnaires were not complete (IPAQ-Group, 2005). Regarding psychiatry diagnoses, 13.4% ($n = 216$) presented a depressive disorder only (13.2% MDD and 3.0% Dysthymia), 15.6% ($n = 186$) an anxiety disorder (3.3% agoraphobia, 3.0% GAD, 1.4% social phobia, 7.5% simple phobia, 2.9% PD) and 4.3% ($n = 59$) comorbid anxiety and depression disorder. The subjects with depressive and/or anxiety disorders were more often female ($p < 0.001$), younger ($p < 0.01$), living more often alone than controls ($p < 0.05$), with lower levels of functioning ($p < 0.001$) and a higher rate of medical diagnoses ($p < 0.001$). Regarding the variable "financial situation", those with depressive disorder more frequently reported to have a "good" situation than the others ($p < 0.05$).

Concerning cognitive functioning 251 subjects (18.1%) presented a mild cognitive impairment (MCI) and 1132 (81.9%) no cognitive impairment. MCI was more common in female ($p < 0.05$), older people ($p < 0.001$), with lower levels of education ($p < 0.001$), living alone ($p < 0.05$), from Geneva ($p < 0.001$), with lower levels of functioning ($p < 0.001$), and with lower levels of physical activity

($p < 0.001$). People with MCI watched an average of 1.91 (S.D. 0.95) hours TV per day while people with no cognitive impairment watched only 1.61 (S.D. 0.97) ($p < 0.001$).

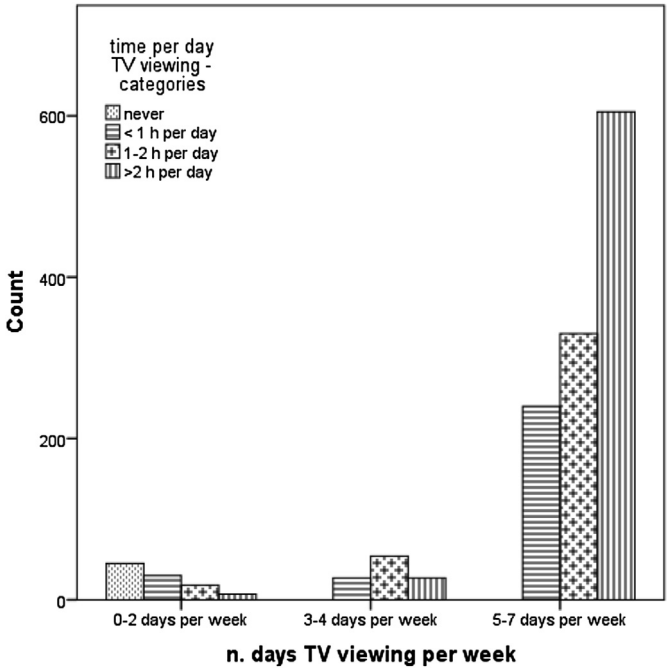
The average daily hours of TV viewing was 1.81 (S.D. 0.94, range 0–3), sitting only was 2.01 (S.D. 0.96 range 0–3) and total daily sedentary time was 3.7 (S.D. 1.44, range 0–6). Additionally, 85.5% ($n = 1175$) of the sample watched 5–7 days/week (43.75% ($n = 605$) for >2 h per day, 23.9% ($n = 330$) for 1–2 h per day, 17.4% ($n = 240$) for < 1 h per day), 7.8% ($n = 108$) watched for 3–4 days, 7.2% watched between 0 and 2 days ($n = 100$), only 3.3% ($n = 45$) of the total sample declared to have never watched TV in the previous week ($p < 0.001$) (see Graph 1).

There was no association between having a diagnosis of depression, anxiety or both and time spent viewing TV ($p = 0.61$) or any sedentary activity ($p = 0.64$) nor levels of physical activity ($p = 0.09$). However, there was a general difference between controls and people with a diagnosis in terms of physical activity levels (Weekly MET Total) ($p < 0.05$, $F = 10.462$, df 1381).

Subjects with MCI presented a higher time spent watching TV ($p < 0.001$) and total sedentary time (sitting plus TV viewing) ($p < 0.001$) but not with higher time in other sitting time ($p = 0.31$). (Table 1)

3.1. Psychiatric diagnoses, cognitive impairment and TV use

Stepwise multiple regression analyses, adjusted for covariates (gender, age, study centre, level of education, living status, work status (employed vs. retired or unemployed), level of functioning, number of physical illnesses, physical activity), were employed to examine further the hypothesized association with either a general depressive or anxiety disorder, or more specific ones with time spent watching TV. According to the model produced no significant association was found between a general diagnosis of either anxiety or depression or both and time spent watching TV. There was only a significant negative association between the specific diagnosis of Major Depressive Disorder (MDD) and TV viewing (see Table 2). On the other side cognitive functioning (MMSE score) and TV viewing were inversely related, after adjusting for covariates. The results can be summarized in a model with 6 significant predictors of TV viewing. Lower average time of TV watching per day is significantly predicted by the following factors: higher level of education, active work status, higher cognitive functioning (as assessed by MMSE scores), higher level of physical activity, and presence of Major Depressive Disorder (MDD). In contrast, severity of comorbid physical illnesses (number of medical diagnoses) increases the risk for high average time of TV watching (see Table 2).



Graph 1. Distribution of days and hours of TV viewing in the sample.

4. Discussion

The hypothesis of a relationship between mental health and TV viewing in the elderly general population was only partially confirmed in this study. While a general association between TV viewing and general diagnoses of depression, anxiety or both was not present, it emerged that persons with a Major Depressive Disorder (MDD) tended to watch less Television than those without such a diagnosis. These results were significant after controlling for possible covariates.

This result is in general not in line with other studies that found a relationship between sedentary behaviour and mental health (Arredondo et al., 2013; Hamer & Stamatakis, 2013; Hamer et al., 2010; Lucas et al., 2011; Teychenne, Ball, & Salmon, 2010). A possible hypothesis of such result may refer to the clinical features of such condition, that include the characteristic anhedonia, i.e. inability to enjoy previously appreciated activities such as TV viewing. Furthermore the task of recalling how many hours of such activity per day might be influenced by the possible memory diminished efficiency with an underestimation of the actual amount.

On the other side it was demonstrated that, even after controlling for possible covariates, subjects with lower cognitive functioning have a tendency to spend more time viewing television than those with no cognitive impairment. This is in agreement with previous research (Fogel & Carlson, 2006; Hamer & Stamatakis, 2013; Kesse-Guyot et al., 2012; Lindstrom et al., 2005; Rundek & Bennett, 2006; Wang et al., 2006).

Furthermore, the need to separately evaluate different types of sedentary activity, in particular to assess TV viewing time, as there are different associations and effects (Hamer & Stamatakis, 2013; Kesse-Guyot et al., 2012), was confirmed in our study.

The main strength of these findings, in comparison with the previously cited studies, regards the target sample, since, to our knowledge, this is the first study investigating the association of TV viewing on the general elderly population mental health and cognitive functioning across different European Countries.

The main limitation of this study refers to the measure of TV viewing. More specifically, the time categories proposed (maximum value “3 h or more”) limited the power of the analyses and reflected only a normal use of the TV and sitting time, not the extremes or abuses. A scale with up to 12 h per day would have been more accurate in measuring the real behaviour. Even better, in order to avoid possible biases due to memory-based self-reporting instruments, would be to gather direct information and measures of actual behaviour through, for example, an accelerometer and a measure of electronic TV monitor (Otten, Littenberg, & Harvey-Berino, 2010). Another limitation is the cross-sectional nature of the study as it prevents us from inferring any causal relationship between variables, and we can only describe associations. We also are aware of the fact that self-report measures generally tend to underestimate the real behaviour (Harvey et al., 2013) and both TV viewing and sitting time could have been even higher than what was reported. Moreover, since the Mini Mental

Table 1
Description of socio-demographic variables and TV viewing across depression, anxiety and cognitive functioning.

	Value	N	%	Controls ($n = 1040$; 75.2%)	Depressive disorder only ($n = 216$; 13.4%)	Anxiety disorder only ($n = 186$; 15.6%)	Co morbid depressive and anxiety disorders ($n = 59$; 4.3%)	*P*-value	Mini-mental score (S.D.)	No cognitive impairment ($n = 1132$, 81.9%)	Mild cognitive impairment ($n = 251$, 18.1%)	*P*-value
	TOTAL	1383							27.66 (1.65)			
Gender	Female	658	47.6	41.6	61.8	66.1	74.6	<0.001	27.57 (1.74)	46.0	54.6	<0.05
	Male	725	52.4	58.4	38.2	33.9	25.4		27.74 (1.56)	54.0	45.4	
Age	Mean age (S.D.)	73.14	(5.69)	73.37 (0.16)	72.46 (0.43)	72.5 (0.45)	71.49 (0.63)	<0.01		72.67 (5.61)	75.23 (5.57)	<0.001
Level of education	High (>13 yrs)	544	39.4	39.6	45.2	33.9	33.9	0.12	27.87 (1.36)	42.2	26.8	<0.001
	Intermediate (9–12 yrs)	460	33.4	31.9	35.0	40.9	37.3		27.54 (1.72)	32.1	39.2	
	Low (<8 yrs)	375	27.2	22.5	19.7	25.2	28.8		27.52 (1.90)	25.7	34.0	
Employment status	Unemployed/retired	1297	94.7	94.8	94.9	92.9	96.6	0.73	27.65 (1.65)	95.4	96.0	0.2
	Employed	72	5.3	5.2	5.1	7.1	3.4		27.72 (1.75)	5.5	4.0	
Financial situation	Very good	179	13.0	13.0	12.8	14.2	10.2	<0.05	27.75 (1.38)	13.7	9.6	0.19
	Good	652	47.3	45.8	60.9	45.7	40.7		27.61 (1.59)	46.7	49.8	
	Just enough, low or very low	548	39.7	41.2	26.3	40.2	49.2		27.69 (1.80)	39.5	40.6	
Living status	Alone	403	29.2	26.9	35.7	34.9	39.7	<0.05	27.50 (1.64)	28.0	34.8	<0.05
	Not alone	977	70.8	73.1	64.3	65.1	60.3		27.73 (1.66)	72.0	65.2	
Centre	Ferrara	486	35.1	37.6	17.8	36.2	35.6	<0.001	28.10 (1.48)	37.9	22.7	<0.001
	Hamburg	380	27.5	29.4	15.3	26.0	28.8		27.71 (1.60)	27.6	27.1	
	Geneva	517	37.4	33.0	66.9	37.8	35.6		27.22 (1.73)	34.5	50.2	
Physical activity	Low	208	15.0	14.2	13.4	21.3	20.3	0.09	27.20 (2.17)	13.4	22.3	<0.001
	Moderate	589	42.6	41.8	51.0	39.4	40.7		27.71 (1.55)	43.3	39.4	
	High	586	42.4	43.9	35.7	39.4	39.0		27.78 (1.51)	43.3	38.2	
WHODAS II simple sum score	Mean (S.D.)	16.38	(5.67)	15.82 (5.22)	17.90 (7.03)	17.83 (6.13)	19.02 (6.14)	<0.001		15.99 (5.21)	18.13 (7.14)	<0.001
Medical problems past year	No	220	15.9	18.9	5.9	4.1	0.9	<0.001		82.7	17.3	0.85
	Yes	1162	84.1	89.1	12.4	10.2	4.9			81.7	18.2	
Daily hours of TV watching	Mean (S.D.)	1.81	(0.94)	1.81 (0.9)	1.7 (1.0)	1.9 (0.9)	1.86 (0.9)	0.61		1.62 (0.97)	1.91 (0.95)	<0.001
Daily hours sitting	Mean (S.D.)	2.01	(0.96)	2.0 (0.9)	2.1 (0.9)	1.99 (0.9)	2.07 (0.9)	0.64		2.07 (0.94)	2.00 (0.96)	0.31
Total daily sedentary hours	Mean (S.D.)	3.7	(1.44)	3.67 (1.4)	3.6 (1.4)	3.7 (1.3)	3.7 (1.4)	0.89		3.62 (1.4)	3.98 (1.42)	<0.001

Table 2
Regression analyses between TV viewing, Mini mental score evaluation, depressive and anxiety diagnoses and covariates.

Model	Standardised coefficients	t	Sig.	Confidence interval 95.0% for B	
	Beta			Lower limit	Upper limit
(Constant)		9.911	0.000	1439.281	2149.625
Years of education	−0.176	−6.652	0.000	−32.722	−17.817
Number of medical diagnoses	0.0147	5.586	0.000	18.732	39.011
Work status	−0.137	−5.246	0.000	−173.024	−78.834
Mini Mental Status - score	−0.105	−4.056	0.000	−38.755	−13.489
Physical activity levels	−0.064	−2.441	0.015	−0.013	−0.001
Major depressive disorder (MDD) (year)	−0.061	−2.333	0.020	−135.983	−11.758

Regression statistics based on linear regression analyses (adjusted for gender, age, study centre, years of education, living status, level of functioning, number of medical diagnosis and physical activity). Corrected R2 = 0.105.

State Examination is mainly a screening tool, not specifically designed to perform a detailed evaluation of cognitive functioning (Folstein et al., 1975), more specific measures of cognitive efficiency should be used in further studies. Finally, regarding the selection process it is possible that the final sample did not include the most fragile or sick at the time of the recruitment therefore our subjects could be slightly more “sane”, and probably more active, than the real population.

In conclusion, even with such limits, this research has provided further evidence of the association between time spent watching Television and some specific characteristics, in particular Mild Cognitive Impairment (MCI), in the 65+ population. The interesting result regarding the inverse association found between TV viewing and Major Depressive Disorder would deserve further investigations, taking into account further variables, such as, for example, sleeping hours or other leisure activities such as reading, listening to the radio or having the possibility of daily social interaction or not (i.e. level of isolation).

Television viewing might displace more physically and/or mentally challenging activities (Sugiyama, Healy, Dunstan, Salmon, & Owen, 2008; Teychenne, Ball, & Salmon, 2008) thus preventing people from engaging in a healthier lifestyle. The inverse association between Television time and Physical activity levels found in our data would also support such statement. However recent studies demonstrated that sitting for long time (thus typically TV viewing) per se could be harmful for health, independently of time spent on physical activities (Ekelund et al., 2006; Hamilton, Hamilton, & Zderic, 2004, 2007; Hamilton, Healy, Dunstan, Zderic, & Owen, 2008; Katzmarzyk, Church, Craig, & Bouchard, 2009). It is well known how challenging it could be to modify people's habits and increase their physical activity (Sun et al., 2013). An important step to promoting a better ageing could be to start from increasing awareness of the negative impact of sitting time and design programs aimed at drastically reduce the time spent viewing TV while increasing time spent on other more challenging mental activities such as reading, playing cards, interacting with other people (Chen et al., 2012; Fratiglioni, Paillard-Borg, & Winblad, 2004; Paillard-Borg, Fratiglioni, Xu, Winblad, & Wang, 2012; Wang et al., 2006). This should be done bearing in mind that the most at risk people could be those with a Mild Cognitive Impairment. As Hamer points out, “even small adverse health effects of this behaviour (TV viewing) could have profound impact at the population level” (Hamer & Stamatakis, 2013).

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