

Article

Personality Phenomena in Women with Alzheimer's Dementia

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Abstract: State-of-the-art literature has been enhancing the significance of personality phenomena in Alzheimer's dementia (AD). This study seeks to identify the relationships of current and premorbid traits and abnormal dimensions in AD. Five-factor model and axis II personality disorders are taken as references. This research was conducted with two groups, which were assessed using the NEO-FFI and PDQ-4+ in individual interview sessions. Current personality measure: AD Group ($n = 44$ female participants); premorbid personality measure: AD group informants ($n = 40$ related participants). Findings suggest that in terms of both premorbid and current studies, the relevance of the dimensions neuroticism (high) and conscientiousness (low), are the most common explanations found in the personality disorder scales, DSM clusters, Appendix B and the global personality disorder index. These data are relevant for the assessment of personality phenomena in Alzheimer's disease.

Keywords: dementia; personality; psychopathology; aging

1. Introduction

The focus of this study is on both personality traits and personality disorders in Alzheimer's dementia (AD).

Recent research notes the simultaneous association between personality traits, cognitive status and death, and also concerns cognitive health span and longevity [1]. The interaction between personality and psychopathology has been focused on, but the topic of mental health in aging populations continues to generate a need for new in-depth research [2,3].

Personality changes in AD have been spotlighted and have shown that the premorbid personality may represent a risk factor for AD [4–12]. Overall, according to the research, prior findings reveal an increase in neuroticism and a decrease in conscientiousness for dementia patients [12–15]. Also, even in the presence of AD neuropathology, recent evidence from meta-analysis studies shows that individuals who score higher in conscientiousness and lower in neuroticism have a reduced risk for dementia [1,16].

It has been widely demonstrated that premorbid personality may be relevant in modifying the dementia disease process or its phenotypic expression [15,17]. However, the link between premorbid personality (i.e., disorders or traits) and the development of AD, and also personality disorders as potential risk factors for AD, have been much less documented to date [2,18–20].

In a prospective sense, the inclusion of personality in the diagnostic assessment of AD seems to be of fundamental importance, with implications for the prevention, treatment of symptoms, and etiological knowledge of these dementia diseases [5,6,13,14,16,21].

Aim of the Study

This study sets out to empirically explore the relations between personality traits (five-factor model of personality; NEO-FFI) and axis II personality disorders (PDQ-4+; DSM-IV) in AD, by studying premorbid and the present time. Study 1 and Study 2 refer to different phases of exploration of the same line of research.



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Study 1—The focus is the prediction of personality disorders by personality traits in AD.

Study 2—The focus is the effect of NEO-FFI personality domains (high mean result in the neuroticism domain and mean low result in the conscientiousness domain) on current and premorbid personality variables in AD. The aim was to analyze the relationship between the NEO-FFI dimensions which emerge systematically in the empirical and meta-analytic literature associated with AD (high mean result in the neuroticism dimension and low mean result in the conscientiousness dimension), with other premorbid and current personality variables assessed in this study.

Further studies based on this sample can be consulted [7–9,22–25]. This study simultaneously focuses on the intrinsic relationships between normative and pathological personality traits from premorbidity to the present, describing a trajectory of the personality phenomenon in AD.

2. Materials and Method

2.1. Participants and Procedure

The Alzheimer's disease group (AD Group) included 44 Caucasian female of Portuguese nationality with a clinical diagnosis of AD (onset), between 1 year and 3 years since diagnosis, living in an urban environment, aged 65 years or above ($M_{Age} = 81.36$ years, $SD = 6.47$ years), with an average of 7.61 years of schooling ($SD = 4.00$ years), and an average of 17.59 points ($SD = 4.44$) in the Mini Mental State Examination.

The AD Group Informants included 40 participants who are respective relatives of the AD Group participants providing assessments of the premorbid personality characteristics.

The study was authorized by the Administrative and Clinical Boards of Institutions. Participants were informed and expressed informed consent. No compensation was given. It complies with the Portuguese Psychologists Board's ethical standards.

The formation of the AD Group was based on the inclusion criteria: female; 65 years or above; clinical diagnosis of AD (onset); absence of psychiatric or neurological co-morbidity. The samples were collected at a Psychiatric Hospital Center and at Geriatric Centers. It is important to note that the AD clinical diagnosis (onset) always considered the medical evaluation provided by psychiatrists and neurologists as a criterion. This investigation yielded a diagnosis of AD according to the International Classification of Diseases, 10th edition [26] and was compliant with the National Institute of Neurological and Communicative Disorders and Stroke, and the Alzheimer's Disease and Related Disorders Association (NINCS-ADRDS) criteria [27]. The protocol was implemented in face-to-face individual sessions [8,9].

2.2. Measures

Socio-Demographic Questionnaire

Mini Mental State Examination (MMSE)

The MMSE is 30-point questionnaire with a total score used extensively in clinical settings to measure cognitive impairment. The MMSE cut-off values are defined for the Portuguese population, differentiated according to literacy (15 points in illiterate individuals; 22 for 1–11 years of schooling; 27 for >11 years of schooling).

The NEO-Five Factor Inventory (NEO-FFI)

The NEO-FFI [28] operationalizes the FFM, and contains 60 items on a 5-point Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree). The NEO-FFI scales enables scores for the following personality domains (traits): neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. An Informant version was also used in the assessment [8–10].

The Personality Diagnostic Questionnaire (PDQ-4+)

The PDQ-4+ [29] is a self-report questionnaire with 99 items based on true/false answers, designed to generate diagnoses that are compatible with the diagnostic criteria

of the DSM-IV axis II for personality disorders and respective clusters, and also allows for a global personality disorder index (PDQ-4+ Total). An Informant version was also used in the assessment [8,9]. The PDQ-4+ justifies the use of the DSM-IV multi-axial system rationale in this study.

2.3. Data Analysis

Effects for p -values ≤ 0.05 were considered statistically significant. The statistical analyses were conducted with the Software PASW Statistics (version 23).

Study 1—Personality traits and abnormal personality dimensions: Premorbid and current study.

The following steps were conducted:

1. Correlations between the NEO-FFI dimensions and PDQ-4+ variables were examined to identify the significant zero-order correlations;
2. The zero-order correlations depict the associations among each of the variables separately, and cannot estimate the unique contribution of each of the significant personality traits in predicting each PDQ-4+ variables (i.e., they do not consider simultaneously the other significant personality trait), or the significant NEO-FFI domain in predicting each abnormal personality variable. So, multiple linear regressions were computed. The traits previously correlated with each or abnormal personality variable allowed us to estimate the unique contribution of each trait to that specific abnormal dimension.

Study 2—Neuroticism and conscientiousness: Relations with personality traits and abnormal personality dimensions on premorbid and current study.

It was necessary to pair the assessment of the AD Group participants with their respective Informant (AD Group Informants). The mean results of both groups (high and low mean results) following the criteria of the mean results obtained in each NEO-FFI dimension in the AD Group.

Neuroticism NEO-FFI: To evaluate significant influence of the mean high result of the neuroticism dimension ($M < 32.73$; $M \geq 32.73$) on the premorbid and current personality variables assessed by the NEO-FFI and PDQ-4+ in AD, the analysis of covariance (ANCOVA) was conducted. The socio-demographic variable MMSE Total was controlled as a covariable, since it was shown to be related to neuroticism in the AD Group. The assumptions for applying the ANCOVA were validated including normality, homoscedasticity, Levene tests ($p \geq 0.14$, for the variables), and homogeneity of the covariable in the factor levels ($p = 0.38$).

Conscientiousness NEO-FFI: to evaluate significant influence of the mean low result of the conscientiousness dimension ($M \leq 34.57$; $M > 34.57$) on the premorbid and current personality variables assessed by the NEO-FFI and PDQ-4+ in AD, the analysis of covariance (ANCOVA) was conducted. The socio-demographic variable age was controlled as a covariable, since it was shown to be related to conscientiousness in the AD group. The assumptions for applying the ANCOVA were validated—normality, homoscedasticity: Levene tests ($p \geq 0.52$, for the variables) and homogeneity of the covariable in the factor levels ($p = 0.39$).

3. Results

Study 1—Personality traits and abnormal personality dimensions: Premorbid and current study.

Table 1 reports the means, standard deviations and zero-order significant correlations between NEO-FFI dimensions and PDQ-4+ variables in AD Group Informants and AD Group.

Table 1. Descriptive Statistics, and Zero Order Correlations Among NEO-FFI Personality Traits and PDQ-4+ Variables on the Alzheimer’s Disease Group Informants (AD Group Informants) and the Alzheimer’s Disease Group (AD Group).

	AD Group Informants					M (SD)	AD Group					M (SD)
	N	E	O	A	C		N	E	O	A	C	
PDQ-4+												
Paranoid	-	-	-	-0.55 ***	-0.29 *	3.83 (1.75)	-	-	-	-	-	4.16 (1.71)
Schizoid	-	-0.35 **	-	-0.46 ***	-	3.03 (1.59)	-	-0.32 *	-	-0.39 **	-0.33 *	3.95 (1.38)
Schizotypical	-	-	-	-0.47 ***	-	3.22 (1.99)	-	-	-	-0.60 ***	-	4.16 (2.58)
Histrionic	0.42 **	-	-	-0.39 **	-	3.25 (2.00)	-	-	-	-0.47 ***	-	3.14 (1.94)
Narcissistic	0.36 **	-	-	-0.57 ***	-0.32 *	3.43(2.44)	0.29 *	-	-	-0.54 ***	-	4.66 (2.34)
Borderline	0.32 *	-	-	-0.58 ***	-0.48 ***	3.60 (2.10)	0.29 *	-	-	-0.61 ***	-	3.91 (2.60)
Antisocial	-	-	-	-0.63 ***	-	1.38 (1.43)	-	-	-	-0.34 **	-	1.64 (1.20)
Avoidant	0.34 **	-	-	-	-	0.35 (0.48)	0.30 *	-	-	-	-	0.48 (0.51)
Dependent	0.54 ***	-	-	-0.40 **	-	2.38 (2.03)	-	0.29 *	-	-	-	3.50 (2.38)
Obsessive	-	-	-0.55 ***	-	0.29 *	4.68 (1.77)	-	-	-	-	-	5.00 (1.70)
Negativistic	-	-	-	-0.64 ***	-	3.33 (1.64)	0.30 *	-	-	-0.41 **	-0.41 **	3.03 (1.98)
Depressive	0.38 **	-	-	-0.31 *	-	3.50 (1.90)	-	-	-	-	-	3.91 (1.70)
PDQ-4+ total	0.55 ***	-	-	-0.68 ***	-0.31 *	38.50 (15.16)	0.29 *	-	0.35 **	-0.62 ***	-0.29 *	44.57 (17.41)
Cluster A	0.31 *	-	-	-0.69 ***	-	10.08 (4.12)	-	-	-	-0.54 ***	-	12.27 (4.80)
Cluster B	0.43 **	-	-	-0.68 ***	-0.35 **	11.65 (6.60)	0.29 *	-	-	-0.65 ***	-	13.34 (6.81)
Cluster C	0.45 **	-	-	-0.41 **	-	10.23 (4.41)	-	-	-	-	-	12.25 (4.94)
Appendix B	0.38 **	-	-	-0.62 ***	-	6.83 (2.64)	0.29 *	-	-	-0.37 **	-0.29 *	6.93 (3.28)
M (SD)	27.68 (9.95)	29.53 (6.18)	16.03 (7.38)	26.90 (7.08)	38.65 (7.49)		32.73 (8.29)	22.70 (6.48)	15.70 (5.86)	26.06 (5.82)	34.57 (7.53)	

Note. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$; [N: Neuroticism; E: Extraversion; O: Openness to experience; A: Agreeableness; C: Conscientiousness].

Table 2 presents the results obtained in multiple regression analysis, in order to predict abnormal personality dimensions (PDQ-4+ variables), as criterion variables, using as predictors the NEO-FFI personality traits that were significantly correlated in the zero-order correlations, in AD Group Informants and AD Group.

Table 2. Results of Regression Analyses: PDQ-4+ Variables Predicted by NEO-FFI Personality Traits on the Alzheimer’s Disease Group Informants (AD Group Informants) and the Alzheimer’s Disease Group (AD Group).

	Predictors	B	β	t	p	R	R ²	F	p
AD Group Informants									
Paranoid	Agreeableness	−0.16	−0.63	−4.17	<0.0001 *	0.60	0.36	10.17	<0.0001 *
	Conscientiousness	0.02	0.07	0.46	ns				
Schizoid	Extraversion	−0.04	−0.14	−0.87	ns	0.37	0.14	3.01	<0.05 *
	Agreeableness	−0.07	−0.31	−1.97	<0.05 *				
Schizotypal	Agreeableness	−0.12	−0.43	−2.94	<0.01 *	0.43	0.19	8.65	<0.01 *
	Histrionic	Neuroticism	0.04	0.19	1.35				
Narcissistic	Agreeableness	−0.13	−0.47	−3.34	<0.001 *	0.56	0.31	8.31	<0.001 *
	Neuroticism	0.04	0.18	1.29	ns				
Borderline	Agreeableness	−0.21	−0.57	−4.04	<0.0001 *	0.64	0.40	8.10	<0.0001 *
	Conscientiousness	0.02	0.07	0.44	ns				
	Neuroticism	0.08	0.39	2.90	<0.001 *				
Antisocial	Agreeableness	−0.11	−0.37	−2.57	<0.01 *	0.65	0.43	8.91	<0.0001 *
	Conscientiousness	−0.02	−0.09	−0.59	ns				
	Agreeableness	−0.14	−0.72	−6.34	<0.0001 *				
Avoidant	Neuroticism	0.10	0.53	3.87	<0.0001 *	0.72	0.51	40.21	<0.0001 *
	Agreeableness	−0.14	−0.72	−6.34	<0.0001 *				
Dependent	Neuroticism	0.12	0.59	5.16	<0.0001 *	0.53	0.28	15.02	<0.0001 *
	Agreeableness	−0.09	−0.33	−2.88	<0.001 *				
Obsessive	Openness	−0.11	−0.47	−3.38	<0.001 *	0.75	0.56	23.11	<0.0001 *
	Conscientiousness	0.05	0.21	1.47	ns				
Negativistic	Agreeableness	−0.15	−0.66	−5.35	<0.0001 *	0.52	0.27	6.93	<0.001 *
	Depressive	Neuroticism	0.08	0.53	3.93				
PDQ-4+ total	Agreeableness	−0.04	−0.17	−1.28	ns	0.66	0.43	28.62	<0.0001 *
	Neuroticism	0.64	0.42	3.83	<0.0001 *				
	Conscientiousness	−1.34	−0.52	−5.31	<0.0001 *				
Cluster A	Conscientiousness	0.23	0.11	0.95	ns	0.64	0.41	12.67	<0.0001 *
	Neuroticism	0.10	0.24	1.81	ns				
Cluster B	Agreeableness	−0.31	−0.53	−4.04	<0.0001 *	0.74	0.55	14.83	<0.0001 *
	Neuroticism	0.18	0.26	2.23	<0.05 *				
	Agreeableness	−0.62	−0.66	−5.17	<0.0001 *				
Cluster C	Conscientiousness	0.06	0.06	0.49	ns	0.70	0.48	17.33	<0.0001 *
	Neuroticism	0.24	0.54	4.38	<0.0001 *				
Appendix B	Agreeableness	−0.20	−0.32	−2.62	<0.01 *	0.73	0.52	19.65	<0.0001 *
	Neuroticism	0.11	0.43	3.63	<0.001 *				
	Agreeableness	−0.18	−0.47	−3.95	<0.0001 *				

Table 2. Cont.

	Predictors	B	β	t	p	R	R ²	F	p
AD Group									
Schizoid	Extraversion	−0.07	−0.35	−2.62	<0.01 *	0.60	0.36	7.33	<0.001 *
	Agreeableness	−0.09	−0.39	−2.92	<0.01 *				
	Conscientiousness	−0.02	−0.12	−0.85	ns				
Schizotypal	Agreeableness	−0.28	−0.63	−5.23	<0.0001 *	0.63	0.40	27.39	<0.0001 *
Histrionic	Agreeableness	−0.17	−0.50	−3.71	<0.001 *	0.50	0.23	13.78	<0.001 *
Narcissistic	Neuroticism	0.02	0.08	0.67	ns	0.65	0.42	15.06	<0.0001 *
	Agreeableness	−0.25	−0.62	−5.03	<0.0001 *				
Borderline	Neuroticism	0.04	0.12	0.92	ns	0.60	0.37	11.36	<0.0001 *
	Agreeableness	−0.25	−0.55	−4.22	<0.0001 *				
Antisocial	Agreeableness	−0.11	−0.51	−3.80	<0.0001 *	0.51	0.26	14.46	<0.0001 *
Avoidant	Neuroticism	0.08	0.38	2.66	<0.01 *	0.38	0.14	7.08	<0.01 *
Dependent	Extraversion	0.11	0.05	1.96	<0.05 *	0.28	0.09	3.84	<0.05 *
Negativistic	Neuroticism	0.04	0.17	1.34	ns	0.64	0.40	8.81	<0.0001 *
	Agreeableness	−0.16	−0.46	−3.43	<0.001 *				
	Conscientiousness	−0.06	−0.21	−1.62	ns				
PDQ-4+ total	Neuroticism	0.24	0.12	0.97	ns	0.70	0.49	9.46	<0.0001 *
	Openness	0.99	0.33	2.77	<0.001 *				
	Agreeableness	−1.46	−0.49	−3.84	<0.0001 *				
	Conscientiousness	−0.39	−0.17	−1.34	ns				
Cluster A	Agreeableness	−0.51	−0.62	−5.10	<0.0001 *	0.62	0.38	26.02	<0.0001 *
Cluster B	Neuroticism	0.10	0.13	1.06	ns	0.69	0.48	18.67	<0.0001 *
	Agreeableness	−0.78	−0.64	−5.46	<0.0001 *				
Appendix B	Neuroticism	0.04	0.10	0.69	ns	0.53	0.29	5.31	<0.001 *
	Agreeableness	−0.25	−0.45	−3.04	<0.001 *				
	Conscientiousness	−0.06	−0.13	−0.89	ns				

Note. ns = not significant; * Two-tailed.

Overall, agreeableness stands out as a general predictor, highlighting its combination with neuroticism and conscientiousness as predictors (Table 2).

Study 2—Neuroticism and Conscientiousness: Relations with personality traits and abnormal personality dimensions on premorbid and current study.

Table 3 presents the results of the analysis of covariance (ANCOVA) relates to neuroticism NEO-FFI. The ANCOVA reveals that the results of the variables under study are significantly influenced by the effect of the neuroticism dimension ($M < 32.73$; $M \geq 32.73$), after accounting for the variable MMSE total as covariable; the effect observed has high and significant dimension, and the strength of the test was also high (Pillai's Trace = 0.88; $F(28,10) = 2.77$, $p = 0.05$; $\eta^2_p = 0.89$; $\pi = 0.79$).

It should be noted that after controlling the effect of cognitive impairment (MMSE total), the high mean result in the neuroticism dimension in AD emerges related to current personality variables: low agreeableness (NEO-FFI) and high mean results in psychopathological variables (PDQ-4+ Total, Clusters B and C and Appendix B) (Table 3).

Table 4 presents the results of the analysis of covariance (ANCOVA) related to conscientiousness NEO-FFI. The ANCOVA shows that the results of the variables under study are significantly influenced by the effect of the conscientiousness dimension ($M \leq 34.57$; $M > 34.57$), after accounting for the variable age as covariable, the effect observed is a very

high and significant dimension, and the strength of the test was also high (Pillai's Trace = 0.93; $F(28,10) = 4.52, p = 0.009; \eta^2_p = 0.93; \pi = 0.96$).

Table 3. Results of the Analysis of Covariance (ANCOVA) on the Effect of the Neuroticism dimension on the Premorbid and Current Variables of the NEO-FFI and PDQ-4+ in Alzheimer's Disease.

Variables	Neuroticism $M < 32.73$ ($n = 18$)	Neuroticism $M \geq 32.73$ ($n = 22$)	F	p	η^2_p	π
	$M (SD)$	$M (SD)$				
NEO-FFI						
Agreeableness	27.50 (4.77)	23.41 (5.03)	5.60	0.02	0.13	0.64
PDQ-4+						
PDQ-4+ Total	36.00 (13.78)	52.41 (18.02)	9.05	0.005	0.20	0.83
Cluster B	0.72 (1.02)	2.14 (1.36)	10.52	0.003	0.22	0.89
Cluster C	1.22 (0.94)	2.05 (1.13)	7.92	0.008	0.18	0.78
Appendix B	0.39 (0.61)	1.23 (0.87)	8.88	0.003	0.21	0.87

Note. In bold are identified cases in which $p < 0.05$. η^2_p (effect size): ≤ 0.05 (Small); [0.05; 0.25] (Medium); [0.25; 0.50] (High); > 0.50 (Very high); π (test power): ≥ 0.80 ; 1:00] [30].

Table 4. Results of the Analysis of Covariance (ANCOVA) on the Effect of the Conscientiousness dimension on the Premorbid and Current Variables of the NEO-FFI and PDQ-4+ in Alzheimer's Disease.

Variables	Conscientiousness $M \leq 34.57$ ($n = 21$)	Conscientiousness $M > 34.57$ ($n = 19$)	F	p	η^2_p	π
	$M (SD)$	$M (SD)$				
PDQ-4+						
PDQ-4+ Total	50.43 (16.91)	39.05 (17.80)	4.02	0.05	0.10	0.50
Cluster B	1.90 (1.31)	1.10 (1.41)	3.35	0.05	0.08	0.43
Appendix B	1.10 (0.83)	0.58 (0.84)	3.74	0.05	0.09	0.47

Note. In bold are identified cases in which $p < 0.05$. η^2_p (effect size): ≤ 0.05 (Small); [0.05; 0.25] (Medium); [0.25; 0.50] (High); > 0.50 (Very high); π (test power): ≥ 0.80 ; 1:00] [30].

It should be noted that the low mean results in the conscientiousness dimension in AD emerges related to current psychopathological variables: high mean results in the PDQ-4+ Total, Cluster B and Appendix B (Table 4).

4. Discussion

4.1. Personality Traits and Abnormal Personality Dimensions: PreMorbidity and Current Study

Generally, data appear to be highly reliant on evidence, both in terms of premorbid and current personality, despite more expressiveness in the former, of higher relevance of the dimensions neuroticism (high) and agreeableness (low), in the most common explanations of the personality disorder scales, clusters, Appendix B and the global personality disorder index (PDQ-4+ Total) in AD.

Equally, in a study conducted by Moran et al. [31], joint high neuroticism and low agreeableness were regarded as consistent dimension characteristics of personality disorder. Neuroticism alone is the primary indicator of personality dysfunction [32]. However, agreeableness is also an important trait which should be assessed by its relationship with high neuroticism in personality disorder [33]. A meta-analysis review [34,35], stress the fact that the most prominent and consistent personality dimensions underlying personality disorders are the positive associations with neuroticism and the negative associations with agreeableness, which have been found to be true. However, in this study, agreeableness (low) appears to be the main indicator of psychopathology. Another interesting feature of this study, which should also be noted, is the role of conscientiousness (negative) in its

association with other traits in the characterization of certain personality disorder scales, with the exception of the positive association with the Obsessive–Compulsive Scale, as to be expected in view of the review studies [34,36]—and even in the clusters and the global personality index. On the other hand, the dimensions openness to experience and extraversion are apparently of less importance in these associations, which is in line with other interpretations [34,37].

Moreover, convergence with some associations proposed by Widiger et al. [38] and O’Connor and Dice [39] have been found in the relationship between the FFM and personality disorders, regarding both premorbidity and current personality in AD, such as the Schizoid, Narcissistic and Borderline scales, while others have not. For example, no convergence has been observed for the Schizotypal, Histrionic and Dependent scales.

In terms of psychopathology, current personality data, in AD, generally reveal the opposite of expectable normal development in advanced adult age, where high neuroticism, low agreeableness and low conscientiousness is observed, suggesting that personality disorders, as deviances of normal functioning, also shed light upon dysfunctions related to expectable development and maturity, and additionally that psychopathology itself is pathoplastic to overall development.

4.2. Neuroticism and Conscientiousness: Relations with Personality Traits and Abnormal Personality Dimensions on Premorbid and Current Study

After controlling the effect of cognitive impairment (MMSE total), the high neuroticism dimension in AD emerges related to low agreeableness (NEO-FFI) and high mean results in current psychopathological variables (PDQ-4+ Total, Clusters B and C, and Appendix B). The data are presented as expectable, despite validating and adding new information. Once again, neuroticism, as a primary indicator of psychopathology, and its negative associations with agreeableness are salient in indicating psychopathology [34]. As to be expected, high neuroticism is related to psychopathology relative to personality disorders displayed by the patients as clinical symptomatology. Hence, high neuroticism is associated with a global personality disorder index and the tendency, in current personality, to come across as being frequently dramatic, emotional or inconstant (Cluster B), and also anxious, fearful and dependent (Cluster C) and equally negativistic and depressive (Appendix B).

After controlling the age effect, the low conscientiousness dimension in AD emerges related to high mean results in current psychopathological variables (PDQ-4+ Total, Cluster B and Appendix B). This is in line with the literature on the harmfulness of low conscientiousness and on dementia studies regarding this trait [5,6,10,13,16,40,41].

Limitations: the small size of the samples, mainly due to the difficulty of accessing individuals diagnosed with AD at the onset phase; lack of information about duration of the illness, medication or other comorbid diseases, and neurochemical CSF biomarkers or brain imaging data; further, personality changes through retrospective assessment by proxies may have introduced some memory bias.

Developing an observation and assessment methodology based on personality traits appears to be pertinent in the diagnosis of AD and follow-up assessments. The personality dimensions associated with AD (high neuroticism and low conscientiousness) identify important relations, particularly with variables of current psychopathology, such as the global personality disorder index and clusters of personality disorders.

Our findings suggest that both in terms of premorbidity and current studies, the relevance of the dimensions neuroticism (high) and conscientiousness (low), in the most common explanations of the personality disorder scales, DSM clusters, appendix B and the global personality disorder index. These data are relevant concerning the assessment to personality phenomena in Alzheimer’s disease. It seems pertinent to continue these studies through the pathological personality traits proposed by DSM-5 Alternative Model of Personality Disorders.

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