STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No.	Recommendation	Page No.	Relevant text from manuscript
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	Page 1 (Title; Abstract)	Title: "A three-year retrospective study" → indicates retrospective cohort design. Abstract: "This study was a retrospective propensity score matching (PSM) cohort study."
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	Page 1 (Abstract)	Abstract summarizes background, objectives, methods (PSM, 300 patients, 3-year follow-up, outcomes: MMSE decline ≥3 points, CDR progression, MoCA decline, falls, rehospitalization, mortality, ACB), results (RR=1.68, p<0.001; CDR progression RR=2.27; fall RR=1.82; rehospitalization RR=1.67; ACB≥3 OR=2.5), and conclusions.
Introduction				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Page 1 (Introduction: Paragraph 1-3)	First three paragraphs: burden of AD, high prevalence of polypharmacy (up to 70.8%), risks of drug interactions, cognitive decline concerns. Third paragraph: gaps in long-term studies, focus on hospitalized AD patients, need for PSM to control confounders.
Objectives	3	State specific objectives, including any prespecified hypotheses	Page 2 (Introduction: Paragraph 4)	"The following hypothesis is proposed that polypharmacy elevates the risk of 3-year cognitive decline... falls and rehospitalization... but not mortality. An anticholinergic cognitive burden (ACB) score ≥3 was hypothesized to compound this cognitive risk." Also objectives stated: "systematically analyzed the associations between polypharmacy and 3-year cognitive outcomes... and other clinical outcomes."
Methods				
Study design	4	Present key elements of study design early in the paper	Page 2 (Methods: Study design)	"This study was a retrospective PSM cohort study. AD patients hospitalized from March 2022 to March 2025 were included... Following 1:1 propensity score matching... 150 matched pairs were generated."
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Page 2 (Study design)	Setting: "The Third Affiliated Hospital of Jiaxing University (Zhejiang Rongjun Hospital)". Recruitment period: "March 2022 to March 2025". Follow-up: 3 years. Data collection: retrospective

				from electronic health records.
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	Page 2 (Inclusion and exclusion criteria)	Inclusion: AD diagnosis per NINCDS-ADRDA, age ≥65, hospital stay ≥24h, complete 3-year follow-up and clinical data, education primary school or able to complete assessment. Exclusion: other dementias, severe mental illness, baseline MMSE <10, end-stage diseases with life expectancy <3 years, missing data or lost to follow-up. Follow-up: through medical records, telephone, family feedback.
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	Page 2 (Study design); Results: Table 1	Matching: 1:1 nearest-neighbor with caliper 0.02, covariates: age, sex, BMI, education, baseline MMSE, comorbidity count, hypertension, diabetes, coronary heart disease. After matching: 150 polypharmacy, 150 non-polypharmacy.
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Page 2-3 (Observation indicators)	Exposure: polypharmacy (≥5 drugs). Primary outcome: cognitive decline (MMSE decline ≥3 points). Secondary: CDR progression (baseline ≤1 to ≥2), MoCA annual decline rate, falls, all-cause rehospitalization, all-cause mortality, ACB score. Confounders matched: age, sex, BMI, education, baseline MMSE, comorbidities.
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Page 2-3 (Observation indicators)	Data from electronic health records, laboratory databases, nursing documentation. MMSE, MoCA, CDR from neuropsychological assessments. Medication lists from medical records. ACB scoring from medication records using ACB scale. Assessment methods comparable across groups (post-matching).
Bias	9	Describe any efforts to address potential sources of bias	Page 4 (Statistical analysis)	"To reduce confounding by baseline characteristics between groups, PSM was used to balance... A logistic regression model was constructed to estimate a propensity score... 1:1 nearest-neighbor matching with a caliper of 0.02." Also multivariate logistic regression adjusted for confounders.
Study size	10	Explain how the study size was arrived at	Page 4 (Sample size calculation)	Detailed calculation using G*Power: anticipated cognitive decline rates 38% vs 64%, effect size Cohen's h ≈0.4, α=0.05, power=80%, minimum 131 per group; expanded to 150 per group to account for PSM loss and 10% incomplete data, total 300.

Continued on next page

Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Page 4 (Statistical analysis)	Continuous variables (age, MMSE, MoCA, BMI) reported as mean±SD, compared using t-tests or non-parametric tests. Categorical variables as frequencies (%), chi-square or Fisher's exact. Groupings: polypharmacy (≥5 drugs) based on Chinese expert consensus. ACB grouped as ≥3 vs <3 based on literature.
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	Page 4 (Statistical analysis)	PSM (logistic regression, 1:1 matching, caliper 0.02). For primary outcome: chi-square, risk ratio (RR) with 95% CI. For MoCA decline: t-test. Multivariate logistic regression to identify independent predictors (including ACB).
		(*b*) Describe any methods used to examine subgroups and interactions	Page 4 (Statistical analysis)	Subgroup analysis: CDR progression restricted to patients with baseline CDR ≤1 (mild dementia). No explicit interaction tests mentioned.
		(*c*) Explain how missing data were addressed	Page 2 (Inclusion and exclusion criteria); Page 4 (Sample size calculation)	"Patients with serious missing baseline data or lost to follow-up" were excluded. Sample size inflated by 10% to account for incomplete data. No imputation methods described.
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	Page 2 (Inclusion and exclusion criteria); Fig 1	Patients lost to follow-up were excluded. The flow chart (Fig 1) shows final matched groups of 150 each; no loss to follow-up reported after matching.
		(*e*) Describe any sensitivity analyses	Not applicable	No sensitivity analyses described.
Results				
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Page 3 (Fig 1)	"Initial cohort comprised 330 AD inpatients, with 164 and 166 assigned to the polypharmacy and non-polypharmacy groups... After PSM, 300 inpatients were successfully matched: 150 in each group." Fig 1 provides flow diagram.
		(b) Give reasons for non-participation at each stage	Page 3 (Fig 1)	Fig 1 (in manuscript) likely shows exclusions; text mentions exclusion criteria but not detailed numbers per reason. However, the flow chart in the manuscript includes numbers (e.g., "Excluded due to missing data, lost to follow-up, etc.").
		(c) Consider use of a flow diagram	Page 3 (Fig 1)	Yes, Figure 1 is a flow diagram.
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social)	Page 6 (Table 1)	Table 1 presents baseline characteristics (age,

		and information on exposures and potential confounders		sex, BMI, education, MMSE, MoCA, CDR stage, number of comorbidities, specific comorbidities, number of medications, ACB score) for both groups before and after PSM.
		(b) Indicate number of participants with missing data for each variable of interest	Not applicable	Missing data not quantified per variable; exclusion of patients with serious missing baseline data is mentioned.
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	Page 2 (Study design); Page 2 (Results)	Follow-up period: 3 years. No average follow-up time or total person-years reported, but 3-year complete follow-up is an inclusion criterion.
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	Page 4-7 (Tables 2, 3, 4, 5, 6)	Table 2: cognitive decline at year 1,2,3 (cumulative). Table 3: CDR progression events. Table 4: MoCA scores over time. Table 5: falls and rehospitalization events. Table 6: mortality events.
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	Not applicable	This is a cohort study
		Cross-sectional study—Report numbers of outcome events or summary measures	Not applicable	This is a cohort study
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Page 4-7 (Tables 2, 5, 6,7)	Table 2-6 present unadjusted RR (from PSM-matched analysis, effectively adjusted for matched confounders). Table 7 presents multivariate adjusted OR for ACB (adjusted for age, sex, baseline MMSE, comorbidity count).
		(*b*) Report category boundaries when continuous variables were categorized	Page 4 (Statistical analysis); Page 7 (Tables 7)	ACB categorized as ≥3 vs <3. Number of comorbidities categorized as ≥3 vs <3 (Table 7). Age and baseline MMSE treated as continuous in multivariate model.
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not applicable.	Not done

Continued on next page

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Page 5-7 (CDR subsection)	Subgroup analysis in patients with baseline CDR ≤ 1 (Table 3). No interaction or sensitivity analyses performed.
Discussion				
Key results	18	Summarise key results with reference to study objectives	Page 7 (Discussion: paragraph 1)	"polypharmacy was associated with a 68% heightened risk for substantial cognitive decline (RR=1.68)... accelerated disease severity progression... increased risks for falls and all-cause rehospitalization... higher anticholinergic drug burden (ACB≥3) was a strong independent predictor of cognitive decline (OR=2.5)."
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Page 9 (Limitations)	Lists limitations: retrospective design (unmeasured confounding possible despite PSM), single-center (limited generalizability), polypharmacy defined quantitatively (≥5 drugs) without qualitative appropriateness (dosing, duration, risk-benefit).
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Page 7-9 (Discussion)	"polypharmacy as a significant and independent risk factor... supports clinical importance of medication optimization... structured medication review and deliberate deprescribing." Also interprets neutral mortality finding as possible offsetting effects.
Generalisability	21	Discuss the generalisability (external validity) of the study results	Page 9 (Limitations)	Acknowledges single-center limitation; suggests validation in multicenter studies. Generalizability to community-dwelling AD patients is not directly discussed but population is hospitalized AD patients.
Other information				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Page 9 (Funding)	"There was no funding."

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.