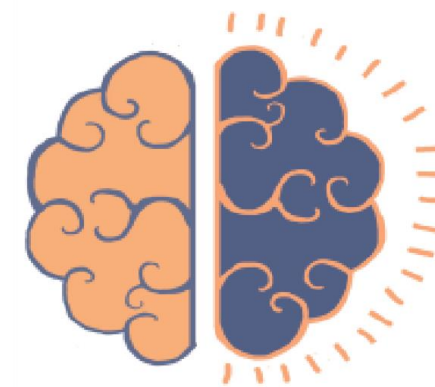


Determinants of Adherence to an Online Risk Factor Management Program to Prevent Cognitive Decline

A Secondary Analysis of the *BetterBrains* Trial



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KEY TAKEAWAY

BetterBrains achieved high, broadly distributed adherence, with little evidence that low adherence was concentrated among less advantaged or higher-risk participants.

BACKGROUND

• **Poor adherence is a major challenge** in multidomain dementia prevention trials, limiting both interpretation of intervention effects and translation into real-world practice.

• **Digital, person-centred interventions** may improve accessibility and scalability, but it remains unclear whether they engage participants equitably or preferentially retain those who are already more motivated, healthier, or socio-demographically advantaged.

• **We examined adherence patterns and baseline predictors of adherence in the BetterBrains trial**, a 24-month online coaching intervention targeting modifiable dementia risk in adults aged 40–70 years with a family history of dementia

AIMS

1. Identify distinct adherence profiles using both a pre-specified binary coaching attendance criterion and latent class analysis (LCA)

2. Determine whether sociodemographic, lifestyle, cardiometabolic, mood, motivational, or cognitive characteristics predicted adherence

3. Examine whether adherence was associated with change in LIBRA, a composite index of modifiable dementia risk, over 24 months

METHODS

Study population Secondary analysis of 517 participants randomised to the BetterBrains intervention arm. Participants were aged 40–70 years, had a family history of dementia, and were followed for 24 months.

BETTERBRAINS INTERVENTION

Participants received online, person-centred coaching using motivational interviewing and personalised goal-setting across four dementia risk-reduction pathways: **‘Hearts’**, **‘Mind’**, **‘Mood’**, and **‘Sleep’**.

Participants were encouraged to complete **≥6 coaching sessions** during the 12-month active intervention.

ADHERENCE MEASURES AND PREDICTORS

Adherence was examined using two complementary approaches:

1. **Coaching attendance**: ≥6 vs <6 sessions.

2. **Latent class analysis (LCA)**: three categorical indicators: coaching sessions (0–5 / 6–8 / ≥9), goals set (0–2 / 3–5 / ≥6), and goals achieved (≤25% / 26–65% / ≥66%)

Baseline predictors were grouped as sociodemographic, lifestyle, cardiometabolic, mood, motivational, and cognitive characteristics.

LIBRA OUTCOME

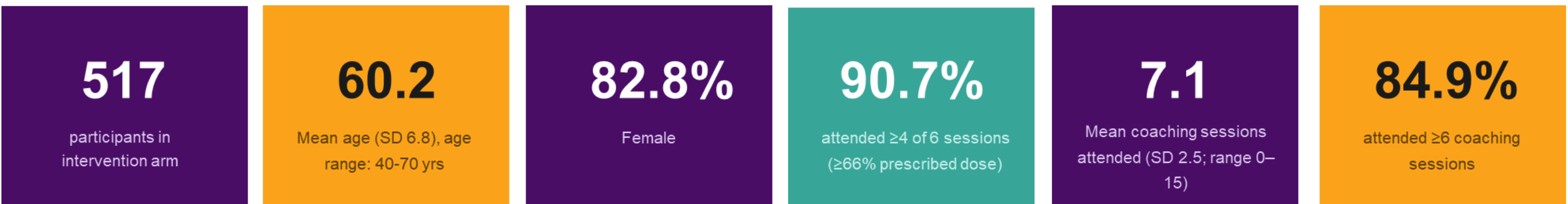
LIBRA is a weighted composite index of modifiable dementia risk; higher scores indicate greater risk.

STATISTICAL ANALYSIS

Multinomial logistic regression examined predictors of latent adherence class membership. Binary logistic regression examined predictors of coaching attendance.

Linear mixed-effects models assessed LIBRA trajectories from baseline to 24 months by adherence group, adjusted for age and residential location

RESULTS



LATENT CLASS ANALYSIS ADHERENCE PROFILES (FIGURE 1)

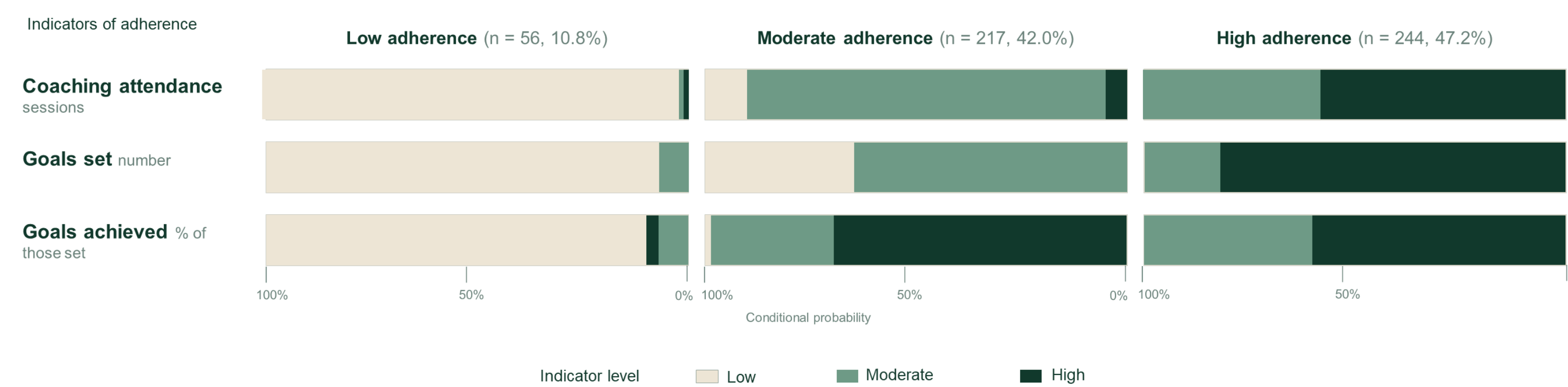


Figure 1. Latent class profiles of adherence indicators. Class-conditional response probabilities are shown for coaching attendance, number of goals set, and proportion of goals achieved across the three-class latent class solutions. Low adherence was uncommon ($n = 56$, 10.8%), while most participants were classified as Moderate ($n = 217$, 42.0%) or High adherence ($n = 244$, 47.2%). The High class was distinguished by greater coaching attendance and more goals set, whereas both Moderate and High classes showed relatively high goal achievement.

PREDICTORS OF ADHERENCE (FIGURE 2)

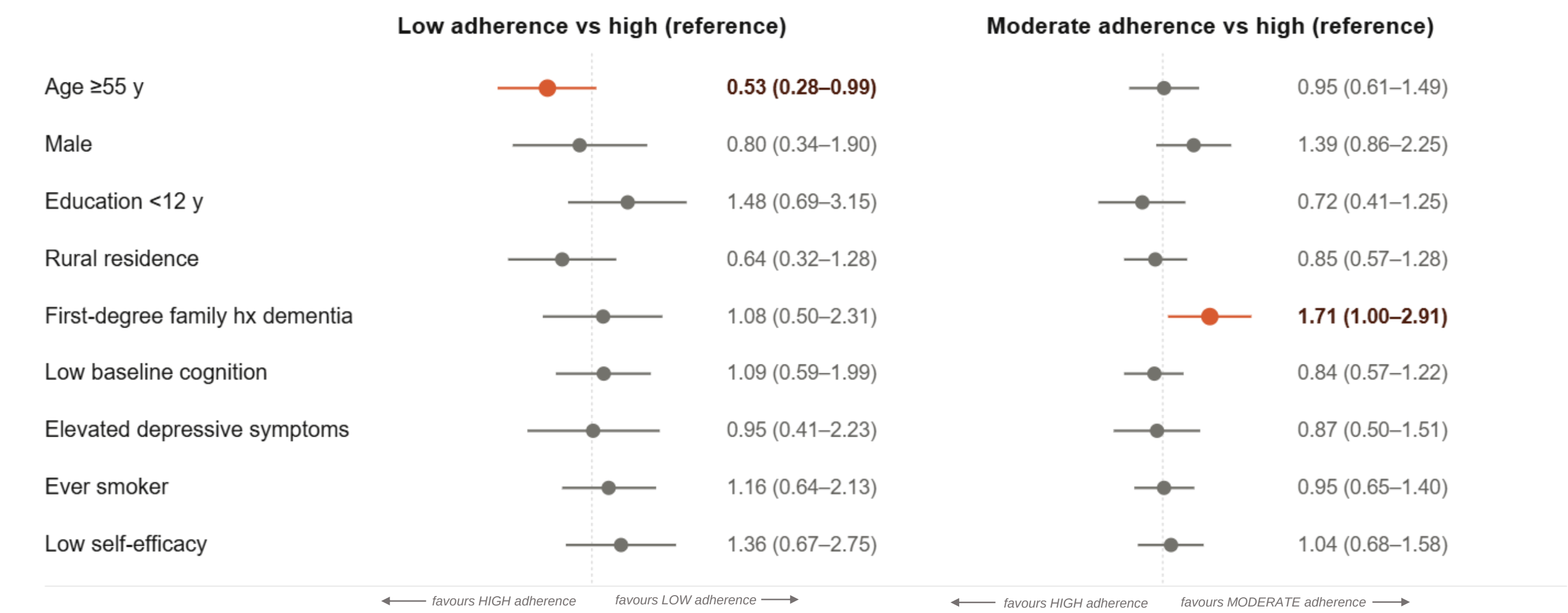


Figure 2. Adjusted predictors of adherence class membership (selected exposures). Selected baseline predictors are shown as RRRs and 95% CIs, with High adherence as the reference class. Lower adherence was not strongly patterned by sociodemographic, health, lifestyle, or motivational characteristics. Age ≥55 years was associated with reduced relative risk of Low adherence; first-degree family history showed a borderline association with Moderate adherence.

LIBRA SCORE TRAJECTORIES BY LCA ADHERENCE CLASS (FIGURE 3)

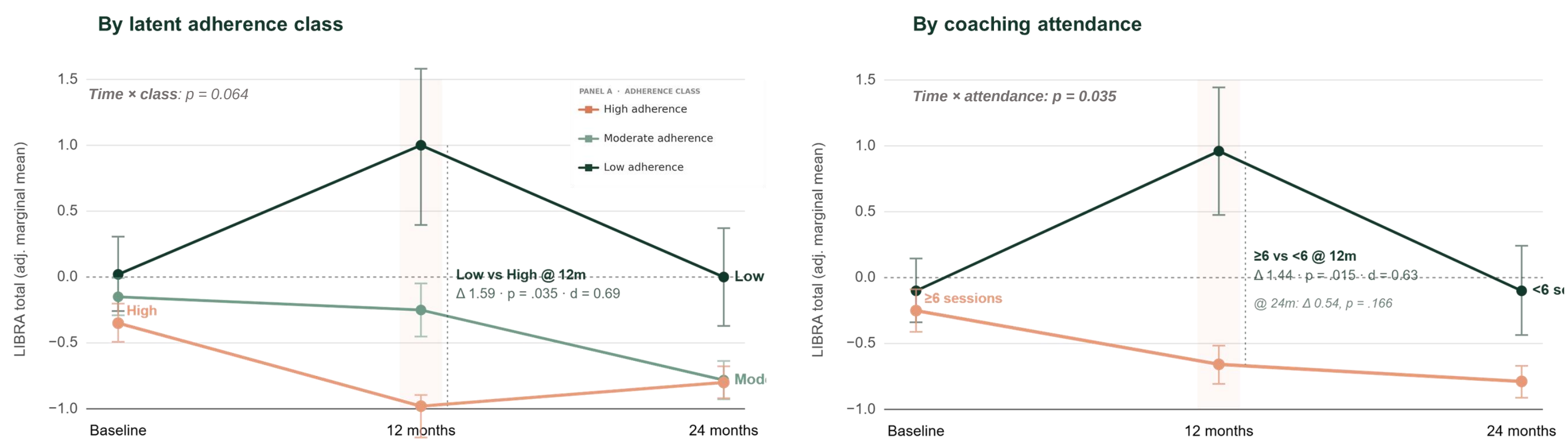


Figure 3. Adjusted LIBRA score trajectories over 24 months by adherence group. Model-estimated LIBRA scores are shown by latent adherence class and coaching attendance, adjusted for age and residential location. Higher LIBRA scores indicate greater modifiable dementia risk. Higher-adherence participants showed greater improvement in LIBRA at 12 months, particularly by coaching attendance, although trajectories converged by 24 months. Error bars represent 95% confidence intervals.

CONCLUSIONS

1. **BetterBrains achieved high adherence**

84.9% met the recommended coaching dose and 90.7% met the conventional ≥66% benchmark.

2. **Low adherence was uncommon**

Only 10.8% of participants were classified as low adherers; 89.2% showed moderate or high adherence based on LCA groupings.

3. **Little evidence of adherence inequity**

Low adherence was not strongly patterned by education, sex, rurality, mood, cognition, cardiometabolic risk, or motivational factors. Participants aged <55 years may need more flexible engagement supports.

4. **LIBRA improved across adherence groups**

LIBRA improved over 24 months overall. Higher adherence was associated with greater 12-month improvement, but trajectories converged by 24 months.

Implication: By achieving high, broadly distributed adherence across diverse baseline characteristics, BetterBrains supports person-centred digital delivery as an equitable and scalable model for dementia prevention

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DISCLOSURES

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