

Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

- | | |
|-------------------------------------|--|
| n/a | Confirmed |
| ☐ | ☒ The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement |
| ☐ | ☒ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly |
| ☐ | ☒ The statistical test(s) used AND whether they are one- or two-sided
<i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i> |
| ☐ | ☒ A description of all covariates tested |
| ☒ | ☐ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons |
| ☐ | ☒ A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals) |
| ☐ | ☒ For null hypothesis testing, the test statistic (e.g. F , t , r) with confidence intervals, effect sizes, degrees of freedom and P value noted
<i>Give P values as exact values whenever suitable.</i> |
| ☒ | ☐ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings |
| ☒ | ☐ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes |
| ☐ | ☒ Estimates of effect sizes (e.g. Cohen's d , Pearson's r), indicating how they were calculated |

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection

Data analysis

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our [policy](#)

The de-identified individual participant data generated during this study are available from the investigators on reasonable requests. Requests should be directed to the corresponding author by email.

Research involving human participants, their data, or biological material

Policy information about studies with [human participants or human data](#). See also policy information about [sex, gender \(identity/presentation\), and sexual orientation](#) and [race, ethnicity and racism](#).

Reporting on sex and gender	The study included both male and female participants. Sex was self-reported by participants at baseline (male = 114, female = 40); gender identity was not assessed. No sex-based analyses were performed because of the modest sample size and the male predominance of the sample.
Reporting on race, ethnicity, or other socially relevant groupings	No race, ethnicity, or other socially relevant categorization variables were collected or used. Participants were recruited from the Youth Quitline service in Hong Kong, where over 90% of the population is of Chinese descent.
Population characteristics	See above
Recruitment	Participants were recruited via the Youth Quitline's regular service channels (calls/referrals, online platforms, and outreach). While voluntary enrollment may have introduced self-selection bias, baseline characteristics were similar between participants and non-participants.
Ethics oversight	The protocol was approved by the Institutional Review Board of the University of Hong Kong/Hospital Authority Hong Kong West Cluster (number, UW 05-185).

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	A pragmatic pilot randomized trial using quantitative methods to evaluate the feasibility of implementing a generative AI chatbot in a youth quitline and compare the abstinence outcomes with standard peer-led telephone counseling.
Research sample	Hong Kong youth aged 25 years or younger who had used any tobacco product, including cigarettes, electronic cigarettes, heated tobacco products, in the past 30 days and were enrolled in the Youth Quitline service. Mean age $\approx$ 18 years; 74% male. The sample represents service users rather than the general youth population. This target group was selected for its relevance to smoking cessation interventions.
Sampling strategy	A convenience sampling strategy was used, recruiting all eligible youths who enrolled in the Youth Quitline service during the study period. Based on a simulation study and our prior pilot trial for smoking cessation, a sample size of about 100 participants would be sufficient to provide precise estimates of the trial feasibility outcomes. Assuming a dropout rate of 35% to account for the greater unpredictability of youth participation, a sample size of 154 (77 per group) was planned for this pilot trial.
Data collection	Data were collected through structured telephone interviews conducted by trained peer counselors. Participant responses were recorded on paper-based questionnaires during each interview and subsequently entered into SPSS for data management and analysis. Data entry staff recorded group assignment information for analytical purposes. Due to the behavioral nature of the intervention, blinding of participants and researchers was not possible.
Timing	Data collection started on July 7, 2024, and participant recruitment ended on November 23, 2024. Follow-up assessments were conducted at 3 and 6 months after baseline, with the final data collection completed on June 13, 2025.
Data exclusions	No data were excluded from the analyses. All randomized participants were included in the intention-to-treat (ITT) analysis
Non-participation	Of 164 eligible participants assessed for the trial, 10 declined participation before randomization. Among the 154 randomized participants, 3 withdrew after enrollment (2 in the intervention group and 1 in the control group) at the 3-month follow-up. During the 6-month follow-up, an additional 2 participants in the intervention group and 1 in the control group withdrew. The main reasons for non-participation and withdrawal were lack of time and loss of interest. The overall participation rate among eligible individuals was 93.9%.
Randomization	Participants were then randomly assigned to either the intervention or control group. A researcher not involved in participant recruitment used an online tool to generate the 1:1 randomization scheme, with random permuted blocks sizes of 2, 4, and 6. For allocation concealment, the researcher prepared sequentially numbered, opaque sealed envelopes. After obtaining consent from the participants, an envelope was opened by the peer counselor to determine the assignment.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☐	☒ Clinical data
☒	☐ Dual use research of concern
☒	☐ Plants

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Clinical data

Policy information about [clinical studies](#)

All manuscripts should comply with the ICMJE [guidelines for publication of clinical research](#) and a completed [CONSORT checklist](#) must be included with all submissions.

Clinical trial registration	NCT06470776
Study protocol	The full trial protocol is available in the Supplement
Data collection	Data collection took place at the Youth Quitline from July 7, 2024, through the completion of the final follow-up on June 13, 2025. Participant recruitment were recruited from the Youth Quitline from July 7 to November 23, 2024.
Outcomes	The outcomes were predefined according to the trial objective of examining feasibility. The primary feasibility outcomes included recruitment rate (number of participants divided by the number of eligible subjects) and retention rate (number of participants completed the follow-up divided by the number of participants). The primary treatment outcome was biochemically validated tobacco abstinence, defined as a negative result of the iScreen OFD test for measuring salivary cotinine (with a cut-off of lower than 30ng/mL). This treatment outcome will inform the effect estimates for planning future definite trials that use the same primary endpoint.

Plants

Seed stocks	This study did not involve any plant materials or experiments, no plant materials or seed stocks were used in this study.
Novel plant genotypes	The study did not involve plant genotypes, transgenic, or gene-edited materials.
Authentication	This study did not involve any plant materials or experiments, no plant authentication or genetic validation procedures were performed.