

# Neuro-epidemiology Training Programs for Early and Mid-Career Researchers in Bangladesh

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## Introduction

- In low and middle-income countries (LMIC), neurological disorders pose a significant economic burden.
- Environmental neurotoxicants are highly abundant in LMICs including Bangladesh.
- Mechanisms of neurotoxicity are yet to be fully elucidated.
- **Due to a shortage of brain health investigators and limited knowledge on neurocognitive assessment tools, very little progress on neuro-epidemiology research has been accomplished in Bangladesh.**

## Specific Aims

- Build neuro-epidemiology research capacity among Bangladeshi researchers through short-term training
- Introduce low-cost neurocognitive assessment and neuro-epidemiological study designs in Bangladesh
- Implement advanced brain health assessment techniques in universities at United States

## Methods

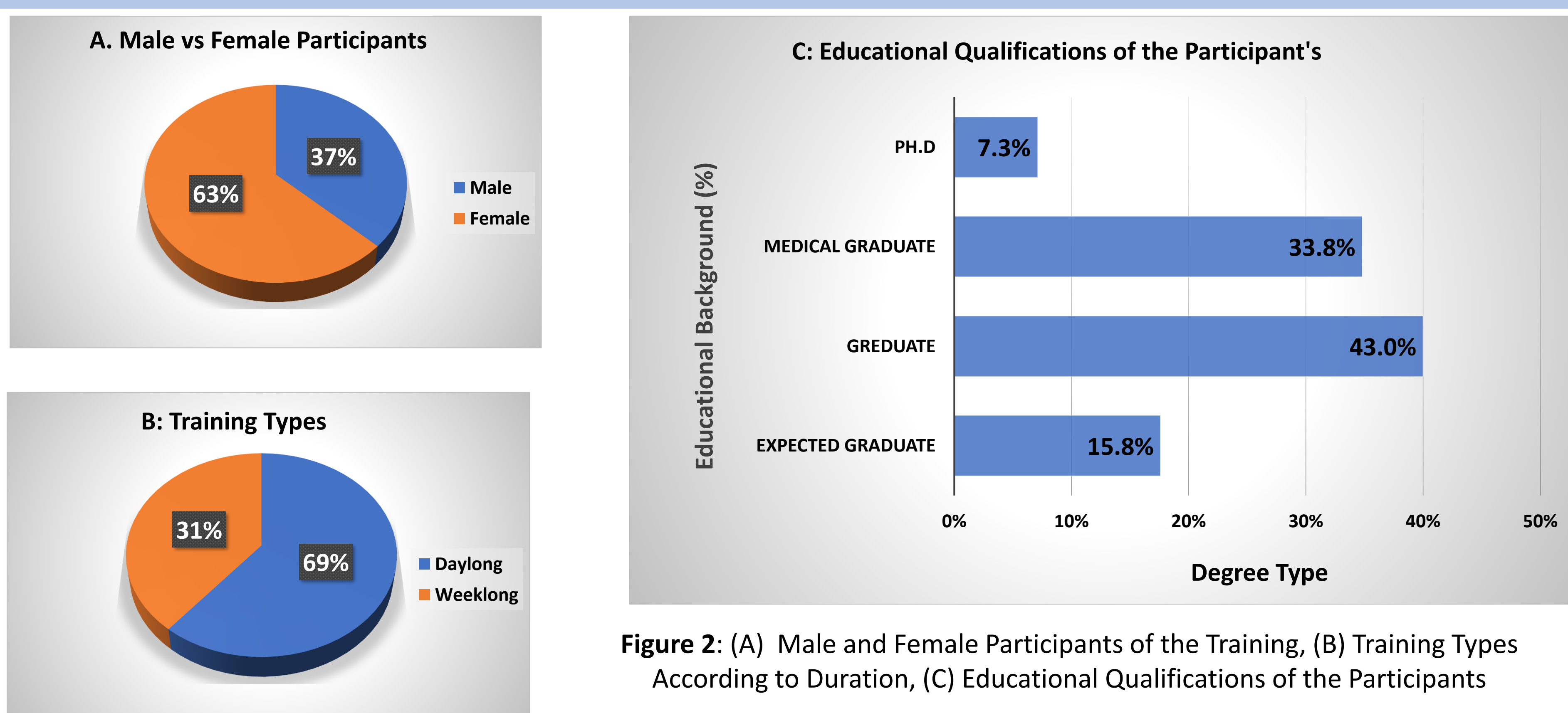
- **Bangladesh Training:** Six capacity building programs conducted (Dec 2021 - Aug 2024)
- Intensive weeklong training and daylong training
- Total participants in Bangladesh programs = 234
- Post-training evaluation on the participants
- Mid-career investigators from Bangladesh visited U.S. universities (n=6)
- **U.S. Training:** introduction to functional magnetic resonance imaging (fMRI), electroencephalogram (EEG) and advanced event-related potential (ERP), and REDCap database development

## Neuro-Epidemiology Research Capacity Building in Bangladesh and USA



**Figure 1:** (A) Visiting researchers from Bangladesh at COHS, SHSU; (B) EEG and ERP training for visiting researchers at the University of Houston in June 2024; (C) A virtual presentation by Dr. Joanne Rovet from SickKids, Canada in the weeklong training for mid-career researchers in March 2022, (D) Trainees observing the BARS neurocognitive tests at our study clinic in Araihaazar; (E) fMRI training for visiting researcher at Texas A & M University in June 2023; (F) Daylong training on neurocognitive assessment in June 2023.

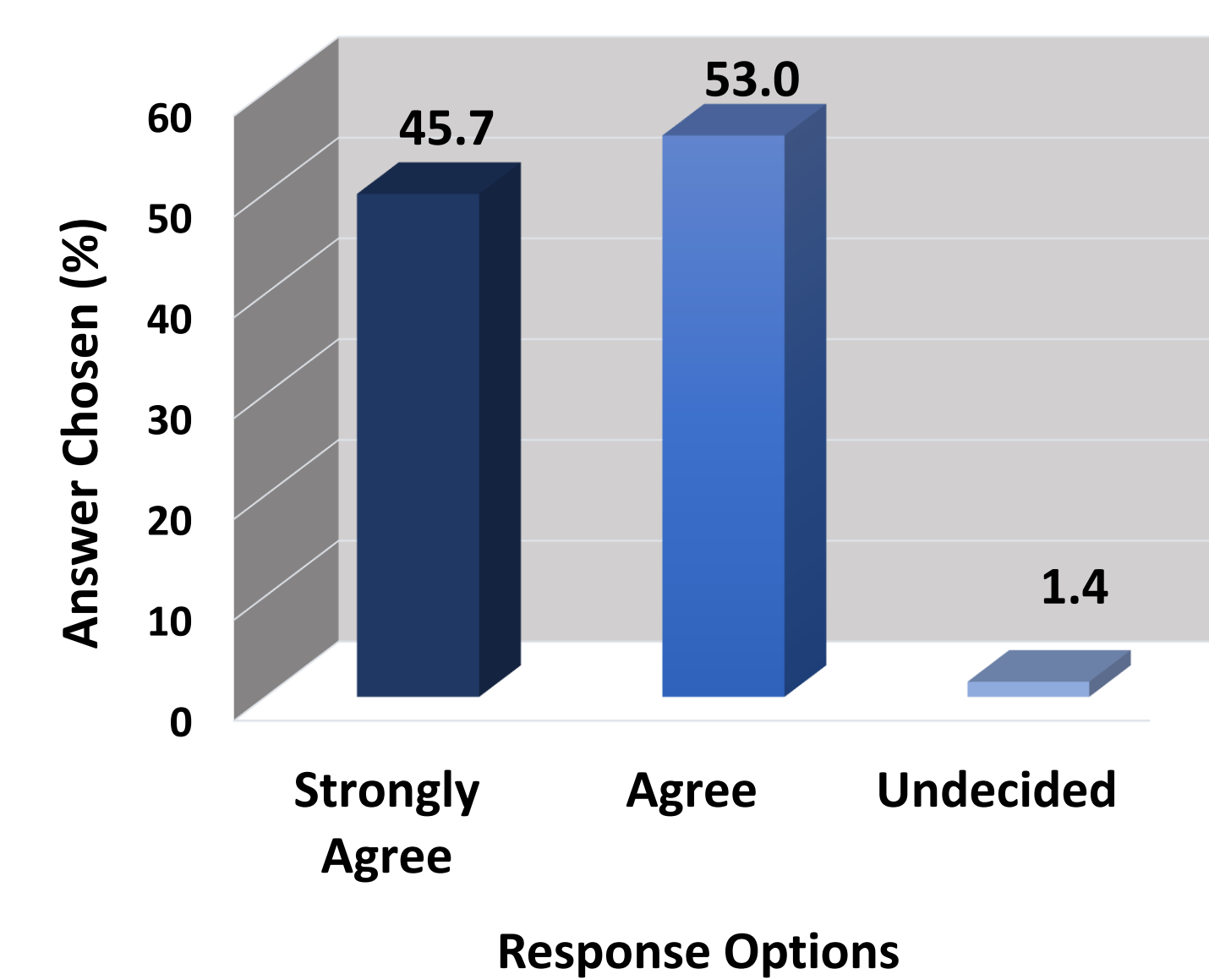
## Results



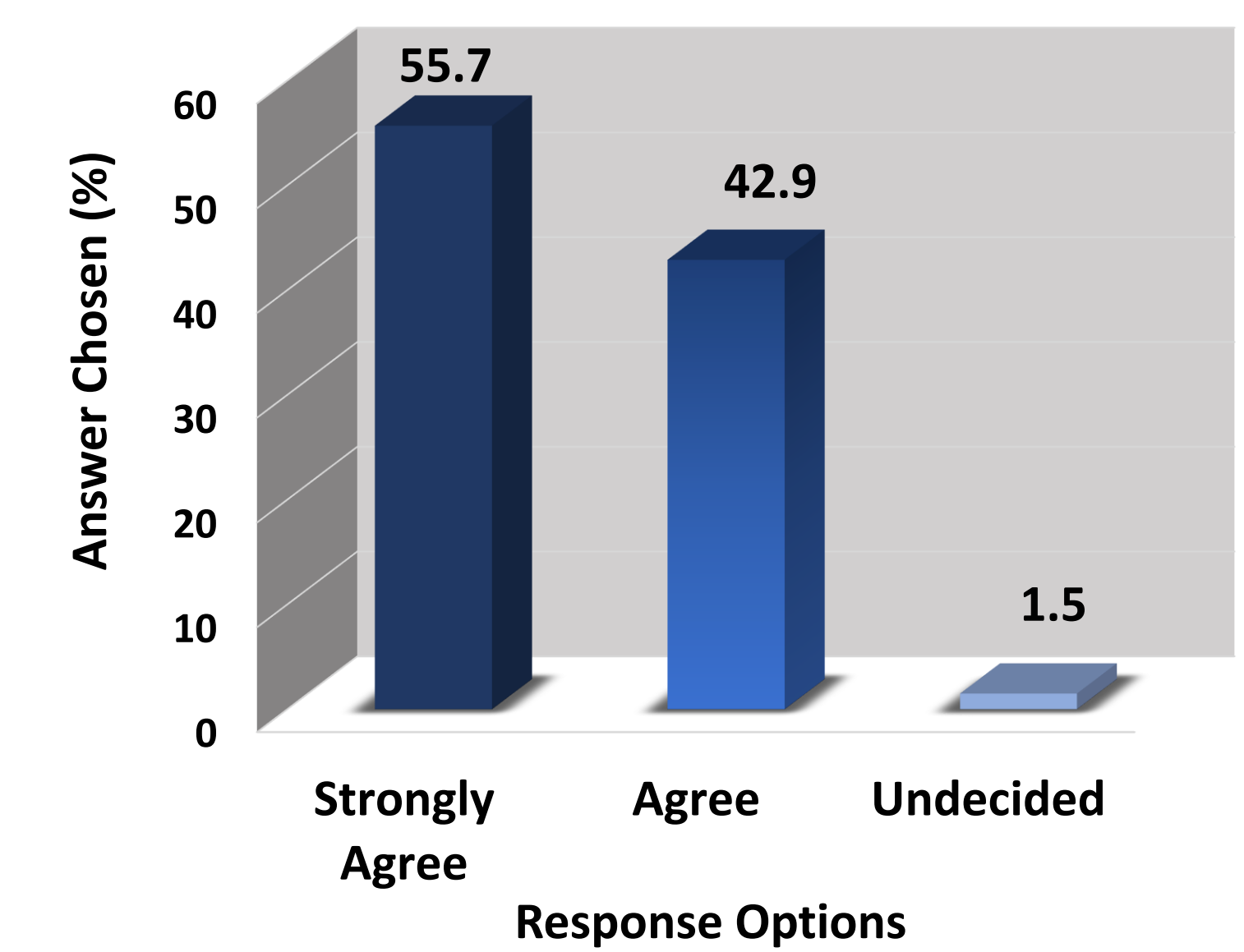
**Figure 2:** (A) Male and Female Participants of the Training, (B) Training Types According to Duration, (C) Educational Qualifications of the Participants

## Results

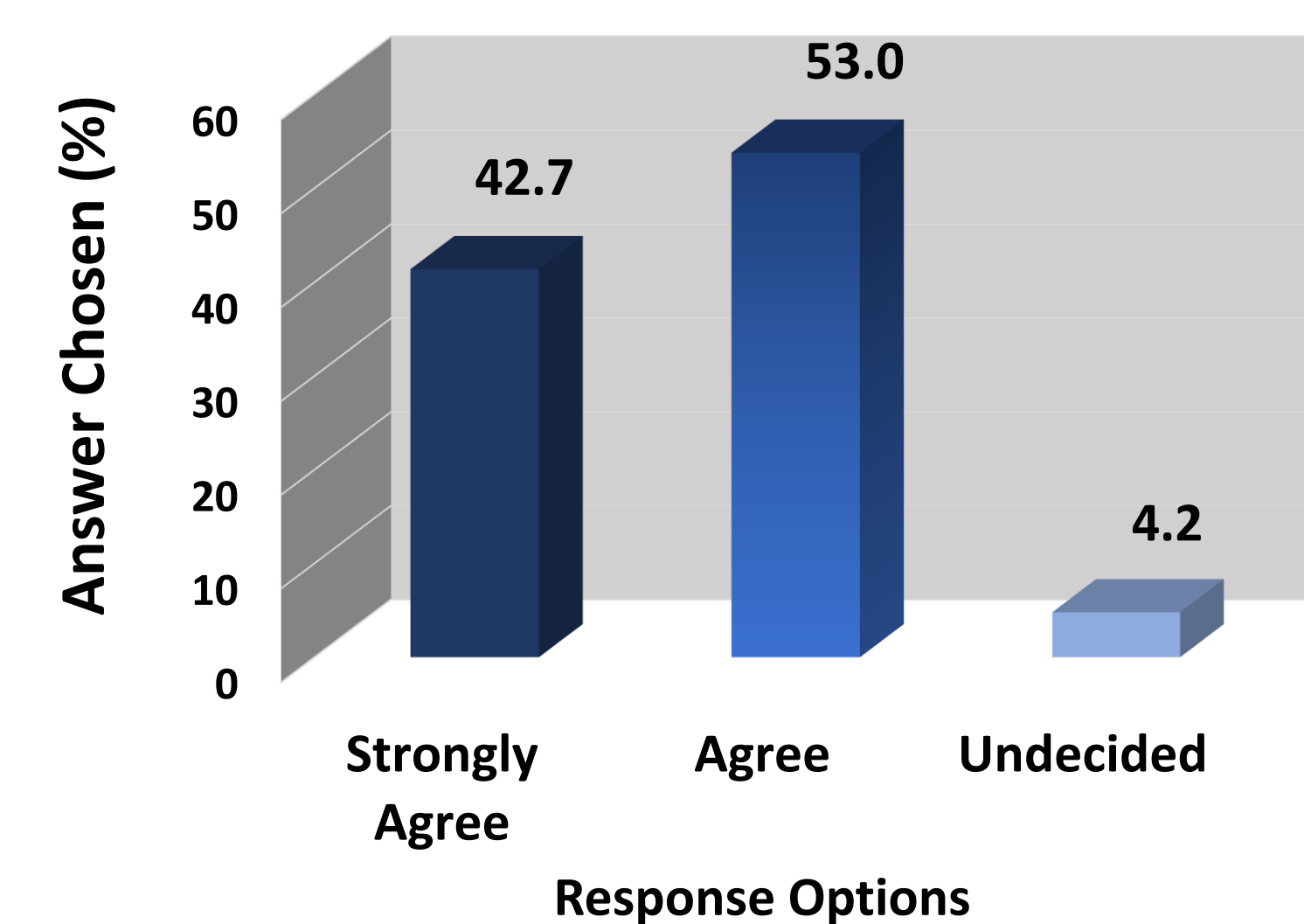
### A: Clarity of Training Presentations



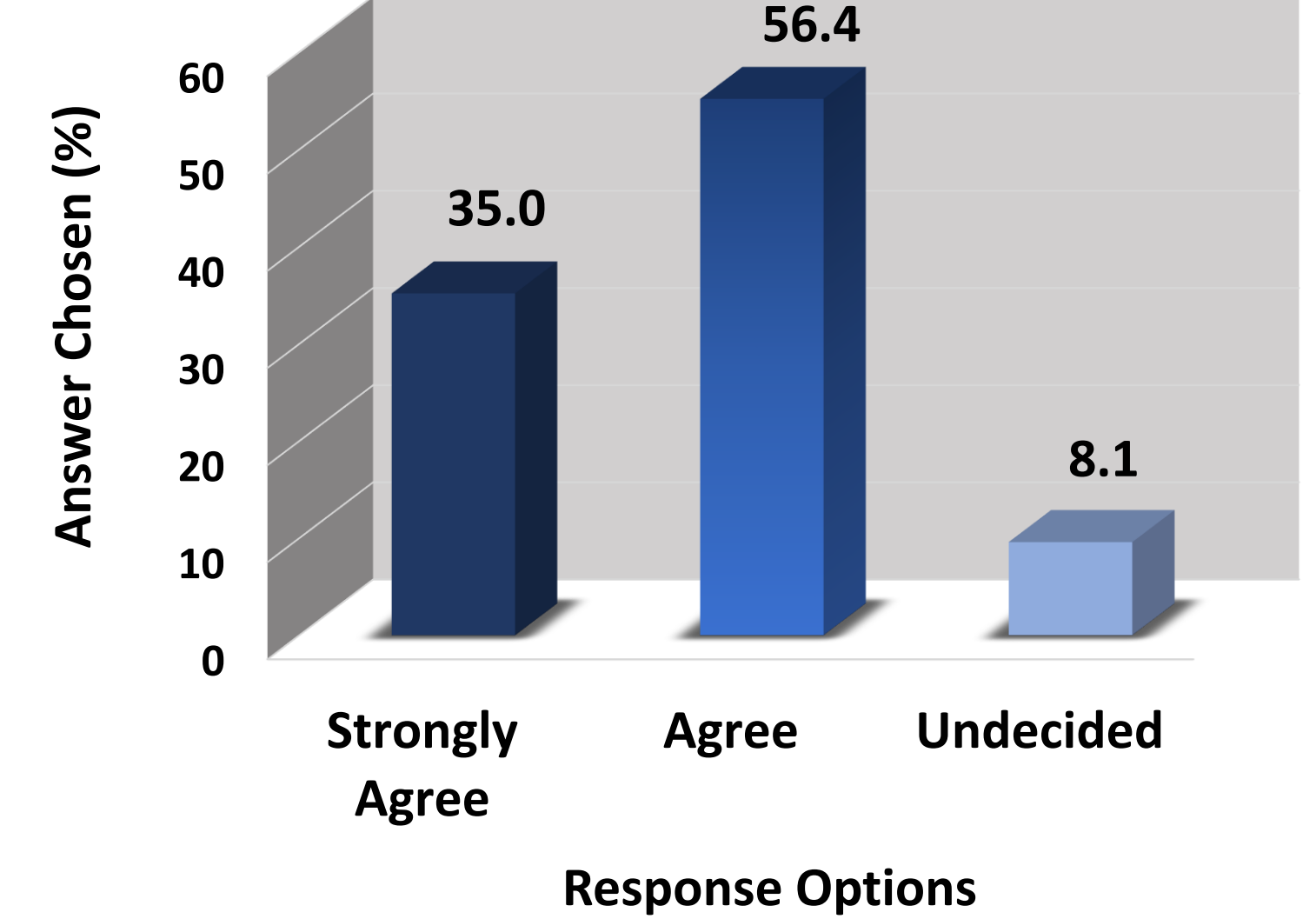
### B: Program Recommended to Peers



### C: Enhanced Understanding of Neurobehavioral Assessment Tools



### D: Enhanced Knowledge of Neuroepidemiology Research



**Figure 3:** Responses from the Trainees Regarding the (A) Clarity of Training Presentations, (B) Recommending Program to Peers, (C) Enhanced Understanding of Neurobehavioral Assessment, (D) Enhanced Neurocognitive Assessment Knowledge

## Findings of the Study

- Post-training evaluations indicate high enthusiasm in neuro-epidemiology research (Figure 3).
- Qualitative feedback indicate more interest to learn the skills of grant writing.
- Enhanced understanding of mid-career investigators on fMRI, EEG, ERP and REDCap Database.
- Almost all participants would recommend the program to peers.

## Interpretation

Feedback from the capacity building training programs offered by the US brain health scientists indicate initial success in terms of enthusiasm and skill development in neuro-epidemiological research skills among Bangladeshi public health investigators.

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