RESULTS OF IMPACT STUDY CARRIED OUT FOR MIXED REALITY EXPERIENCE *IMPULSE*

DIGEST FOR GENERAL PUBLIC

STUDY SUPPORTED BY

agog

IN PARTNERSHIP WITH

ANAGRAM

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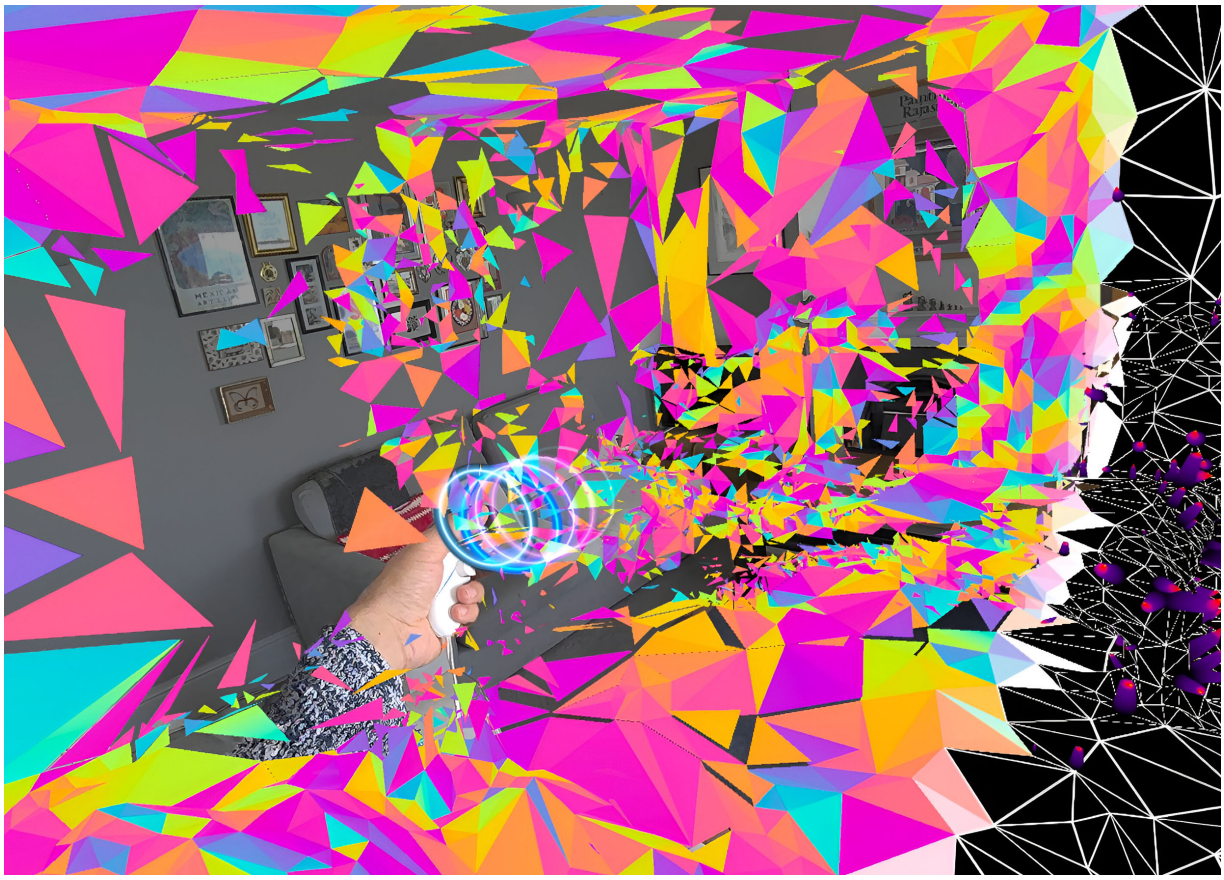

Gameplay: Hoovering up information from inside the mind

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Introduction – How to Read This Report

This report presents the results of Mixed Reality Experience: Impulse, an immersive mixed reality (MR) experience designed to help people better understand Attention Deficit Hyperactivity Disorder (ADHD) and to encourage empathy, learning, and positive behaviour toward people with ADHD.

The goal of this report is to share the findings in a clear and accessible way for the general public, including educators, families, professionals, and anyone interested in inclusion and mental health. You do not need a scientific background to understand this report.

What this report includes:

- Who participated in the study and their background
- How people learned about ADHD through the MR experience
- Changes in attitudes, empathy, stigma, and behaviour change
- What happened immediately after the experience and one month later
- How empathy, immersion, and behaviour change are connected

How to interpret the results:

- Percentages (for example, *7 out of 10 people*) show how many participants changed.
- Changes over time (before, immediately after, and one month later) show whether the experience had a lasting impact.
- Correlations explain how strongly two things are related, such as empathy and positive behaviour.
    - Higher numbers mean a stronger connection.
    - A positive relationship means that when one increases, the other also increases.

This report focuses on real-world impact: how MR Experience: Impulse affects understanding, attitudes, and everyday actions toward people with ADHD.

1. Who participated in the study?

A total of 118 people joined the study, and they were divided into three groups based on their experience with ADHD, as presented in Table 1:

Group 1 – People with ADHD or who think they might have it

This group had 54 participants. These individuals either have an ADHD diagnosis or believe they may have ADHD. Their personal connection gives them first-hand experience of the challenges of ADHD.

Group 2 – People who know someone with ADHD

This group included 42 participants. They do not have ADHD themselves, but they have a close family member or friend with ADHD, or they work closely with people who have ADHD (for example, teachers, counsellors, or caregivers). Their experience comes from supporting others.

Group 3 – People with no direct connection to ADHD

This group had 22 participants. They do not have ADHD and do not personally know someone with the condition. They also do not work with people who have ADHD. This makes them a useful comparison or control group for studying changes in knowledge, attitudes, and behaviour.

Table 1. Description of study participants by gender

Group	Female	Male	Non-binary	Prefer not to say	Total
1	27	17	6	4	**54**
2	27	14	1	0	**42**
3	11	11	0	0	**22**

2. How old were the people in the study?

People of various ages participated, ranging from **13 to 74 years old**. Most participants were young or middle-aged adults, as displayed in Figure 1.

The largest groups were people in their **20s and 30s**, especially ages:

- **22 years old** (about 8 out of every 100 participants)
- **35 years old** (about 7 out of every 100)
- **31 and 32 years old** (about 6 out of every 100)

Only a few participants were teenagers or older adults.

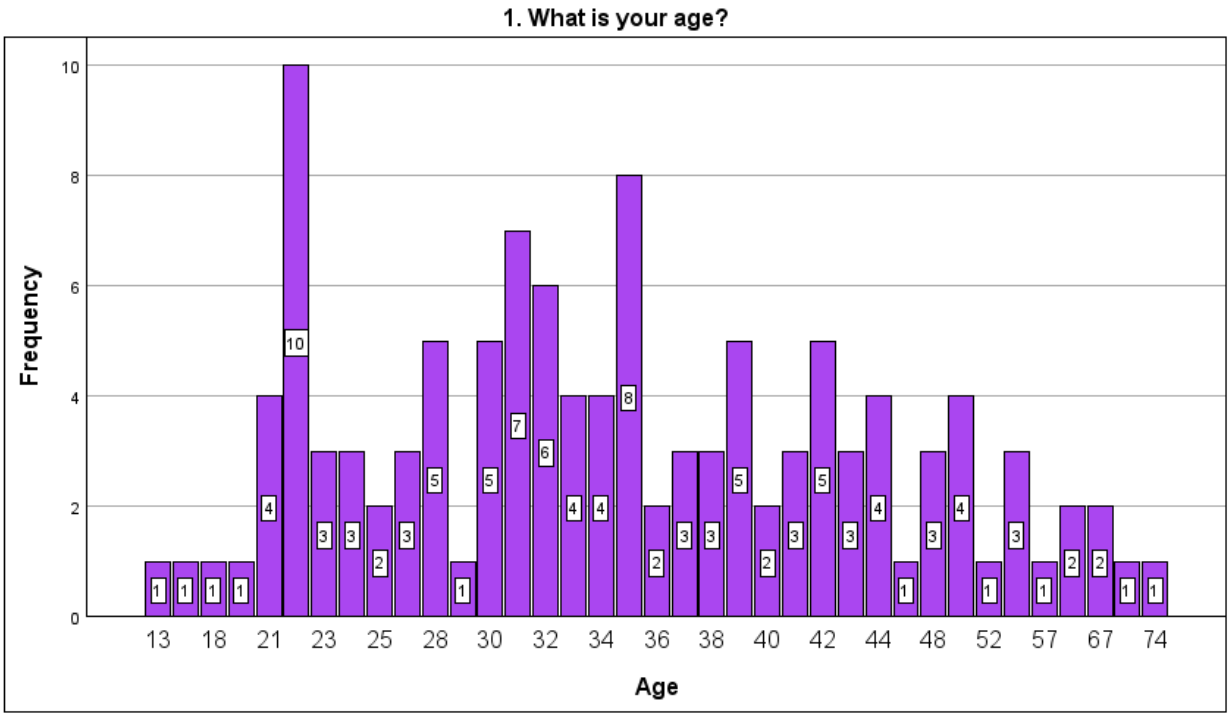


Figure 1. Age of the participants

3. What is the Education Level of the Participants?

Most participants in the study were highly educated, as illustrated in Figure 2.

- Nearly **half** had a **Bachelor's degree** (about 47%).
- Around **30%** had a **Master's degree**.
- A smaller group had **some college** or vocational training.
- Only a few had a **secondary school** or a **doctoral degree**.

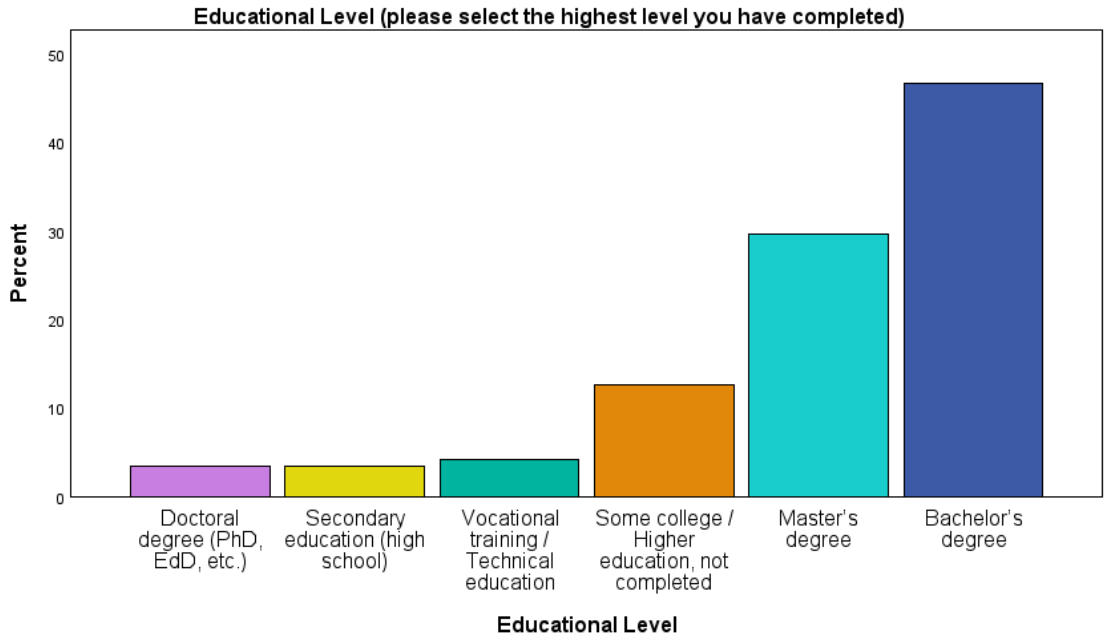


Figure 2. Education Level of the participants

4. Have Participants Used Virtual Reality Before?

Most participants had tried Virtual Reality (VR) at least once, as presented in Figure 3.

- **62%** had used VR **occasionally**.
- **31%** had **never** used VR.
- Only **8%** used VR **frequently**.

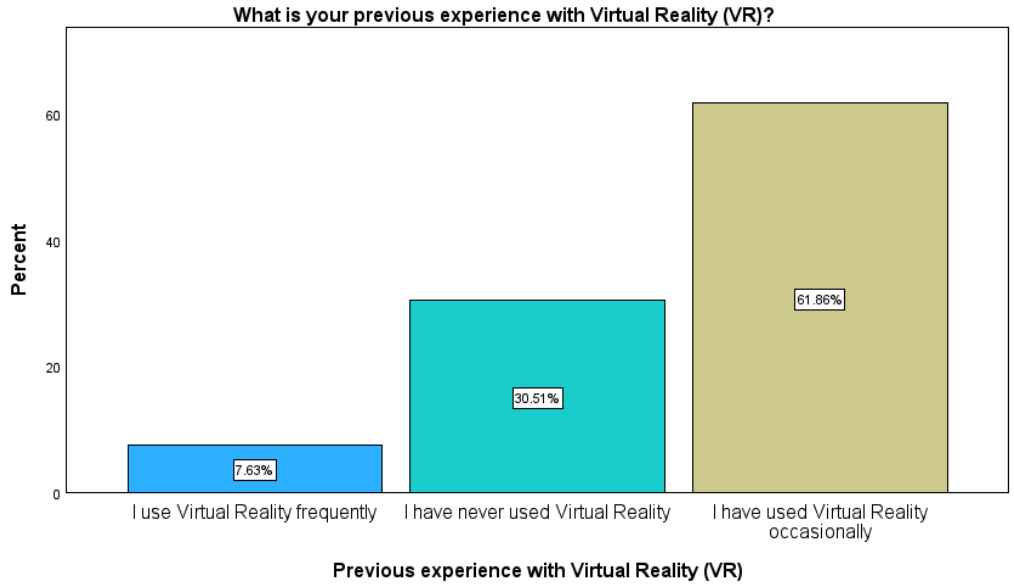


Figure 3. Previous experience of the participants with VR

5. How Experienced Are Participants With Virtual Reality (by Gender)?

Most participants had tried VR at least occasionally, but patterns differed by gender, as depicted in Table 2:

- **Females:** 56% used VR occasionally, 39% never, 3% frequently.
- **Males:** 63% used VR occasionally, 13% never, 15% frequently.
- **Non-binary:** 63% occasionally, 25% never, 0% frequently.
- **Prefer not to say:** 50% occasionally, 50% never, 0% frequently.

Table 2. Description of Participants' VR Experience by Gender

Gender	Never Used VR	Occasionally Used VR	Frequently Use VR
Female (n = 66)	**39.4%**	**56.1%**	**3.0%**
Male (n = 46)	**13.0%**	**63.0%**	**15.2%**
Non-binary (n = 8)	**25.0%**	**62.5%**	**0%**
Prefer not to say (n = 4)	**50.0%**	**50.0%**	**0%**
Overall (N = 118)	**30.5%**	**61.9%**	**7.6%**

6. Have Participants Had Previous Experience With ADHD Education or Resources?

About half of the participants (49%) had some prior experience with ADHD courses, workshops, or resources, while the other half (51%) had none, as shown in Figure 4.

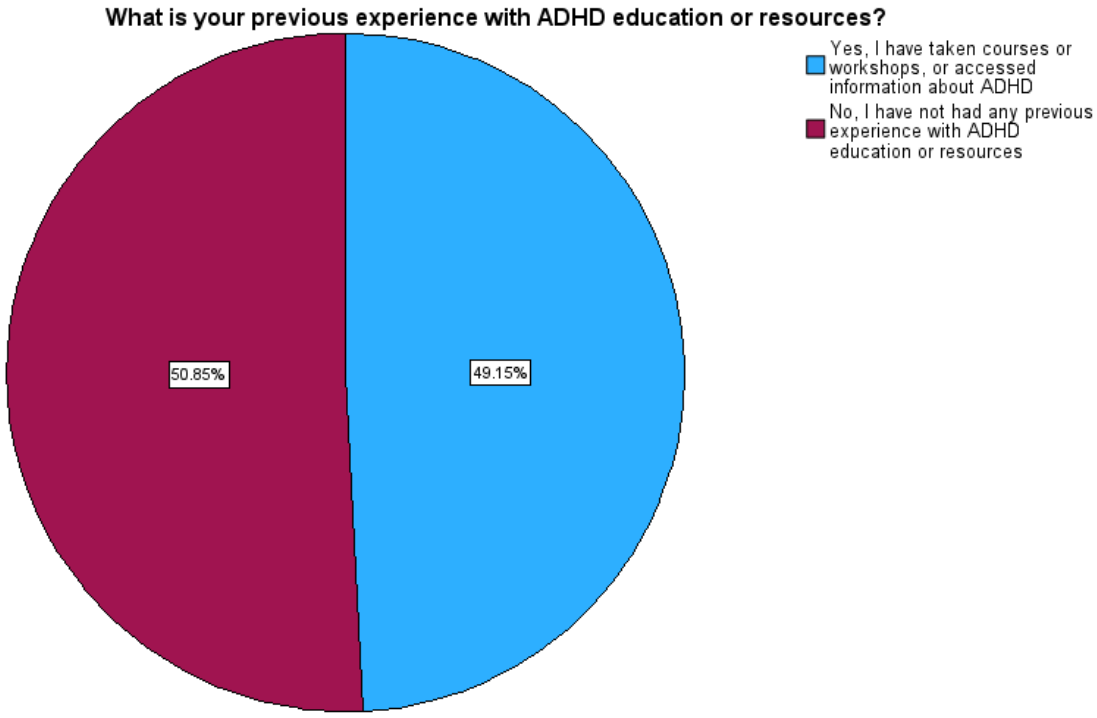


Figure 4. Previous experience of the participants with ADHD education or Resources

7. Do Previous ADHD Education Experiences Differ by Gender?

The results show some gender differences in prior ADHD education. About half of the female participants had experience with ADHD resources, while the other half did not. Most non-binary participants (6 out of 7) had prior ADHD education. In contrast, more males had no previous exposure to ADHD courses or resources. Participants who preferred not to disclose their gender were evenly split, as shown in Table 3.

Table 3. Description of Participants' ADHD Education or Resources by Gender

Gender	Yes (Has previous ADHD education)	No (No previous ADHD education)	Total
Female	34	31	65
Male	16	26	42
Non-binary	6	1	7
Prefer not to say	2	2	4
Total	**58**	**60**	**118**

8. Demographic Summary of Participants Included in the Behavioural Change Analysis

A total of 118 participants were initially recruited for the study. All participants completed a pre-test assessment before the Mixed Reality (MR) Impulse experience and a post-test assessment immediately after the MR experience.

For the analysis of behavioural change, complete pre- and post-test data were available for 106 participants in the follow-up analysis 1 month later, who were therefore included in the final analyses. Participants were assigned to one of three experimental groups (Groups 1, 2, and 3), as presented in Table 4.

Table 4. Description of Participants by Gender (N=106)

Gender	**Group 1**	**Group 2**	**Group 3**
Female (1)	22 (41.5%)	20 (38.5%)	8 (20.0%)
Male (2)	15 (34.1%)	14 (31.8%)	10 (22.7%)
Non-binary (3)	5 (71.4%)	1 (14.3%)	0 (0%)
Prefer not to say (4)	4 (100%)	0 (0%)	0 (0%)
Total	46	35	18

9. Knowledge about ADHD: Did the Mixed Reality (MR) Experience Help People Learn About ADHD immediately, and did that knowledge last for 1 month after participants had engaged with the experience?

We examined whether the MR experience helped participants learn more about ADHD immediately after the experience and whether those gains were maintained one month later. Participants were divided into three groups: those with ADHD (Group 1), those with a close family member or friend with ADHD (Group 2), and those with no personal connection to ADHD (Control group or Group 3).

Yes, the results showed that the MR experience was effective for increasing knowledge about ADHD. The results indicate that participants gained a better understanding of ADHD after engaging with the Mixed Reality (MR) experience, and that this knowledge was largely retained one month later.

Before the MR experience (pre-test), all three participant groups—those with ADHD, those with a close family member or friend with ADHD, and those with no personal connection to ADHD (control group)—showed relatively low levels of knowledge about ADHD. Immediately after the experience (post-test), knowledge increased across all groups, demonstrating that the MR experience effectively facilitated immediate learning. The improvements were also durable. One month later, participants maintained or even slightly increased their understanding, suggesting that the MR experience promoted memorable and lasting learning.

The magnitude of learning gains varied by group. As displayed in Figure 5, we can see how knowledge about ADHD changed over time for three groups. Group 1 (participants with ADHD) had the highest level of ADHD knowledge at every stage, starting with a strong understanding and continuing to improve after the intervention and at the one-month follow-up. Group 2 (participants with NO-ADHD, with a close family member or friend with ADHD) showed steady and notable improvement over time, beginning with moderate knowledge and nearly reaching the same level as Group 1 after one month. Group 3 (participants with NO-ADHD, and with no personal connection with ADHD) started with the lowest level of knowledge but demonstrated a clear increase after the intervention and maintained this improvement at the one-month follow-up, although their scores remained slightly lower than those of Groups 1 and 2.

Specifically, the mixed reality (MR) experience appears to be most effective for Group 3. Although Group 3 started with the lowest level of ADHD knowledge, they showed the largest improvement from the pre-test to the post-test, and this improvement was largely maintained one month later. This indicates that the MR experience had the strongest learning impact on participants who initially had less knowledge. At the same time, Groups 1 and 2 also benefited from the MR experience, but their gains were more gradual because they already had higher baseline knowledge. Overall, the MR intervention was effective for all groups, with the greatest relative impact observed in Group 3. We concluded that this Mixed Reality experience Impulse effectively increased ADHD knowledge for most participants and supported both immediate and sustained learning, highlighting the potential of immersive learning experiences to foster a deeper understanding of complex topics like ADHD.

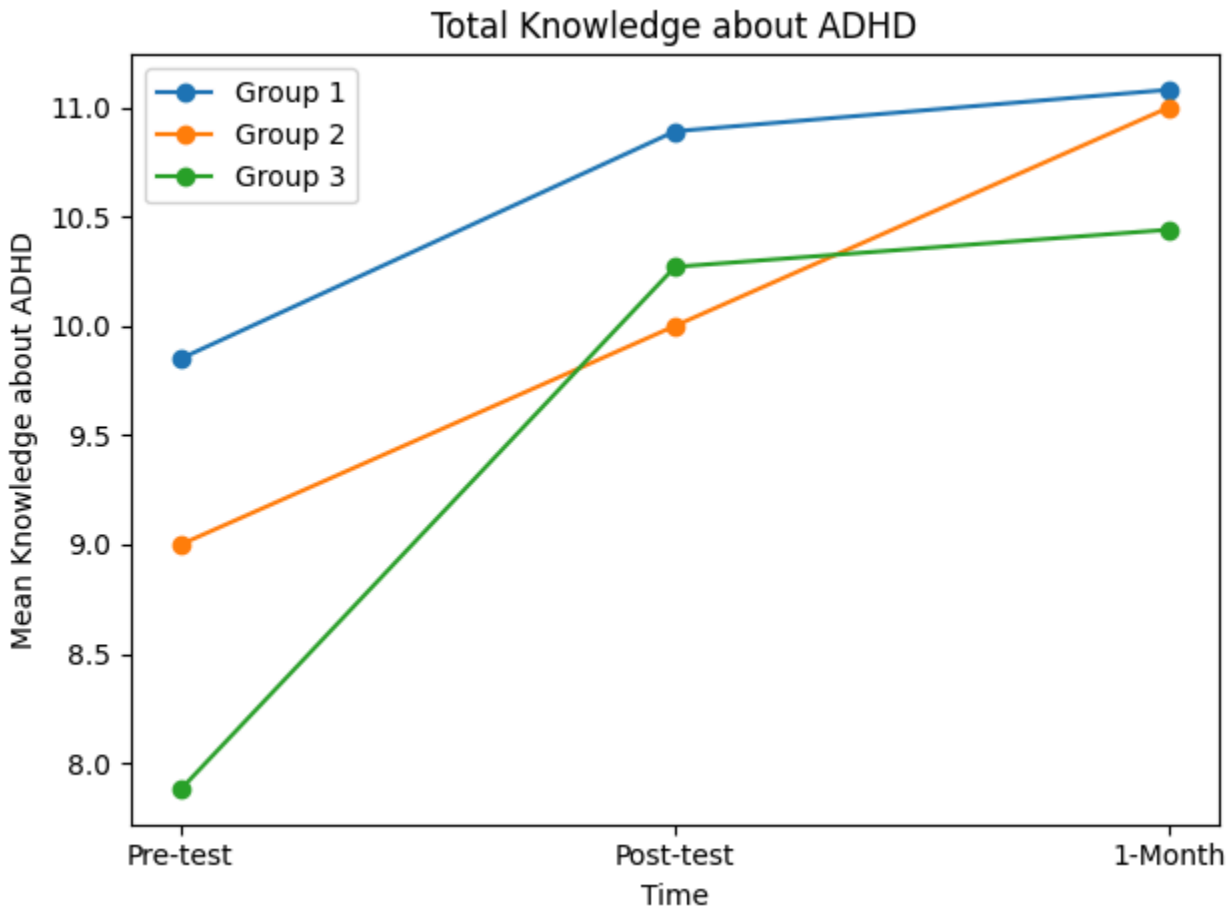


Figure 5. Total Knowledge of ADHD by Group and Time

10. How Much Did People Know About ADHD Before and After the MR Experience Impulse?

In this study, ADHD knowledge was measured in two ways: **general knowledge**, assessed through questions about commonly known facts such as symptoms, diagnosis, and co-occurring conditions, and **VR-based knowledge**, assessed through questions related to information presented in the virtual reality experience, including brain function, behaviour, and strategies for managing attention and overload. Specifically, the ADHD knowledge test measured two types of understanding:

1. **General Knowledge** – This includes basic, cultural, or commonly known facts about ADHD, such as its symptoms (inattention, hyperactivity, impulsivity), what ADHD stands for, and conditions that often occur alongside it, like anxiety. These questions don't rely on any special experience—they test what people know or have learned from everyday sources.

2. **MR-Based Knowledge** – This focuses on information learned through the immersive virtual reality (MR) experience. It covers how ADHD affects the brain and behaviour, including which brain areas are involved in focus and planning, how neurotransmitters like dopamine influence motivation, and strategies for managing attention and overload. These questions test what participants gained from interacting with the VR simulation rather than general awareness.

General Knowledge about ADHD over time

Before the MR experience *Impulse*, participants already showed a moderate level of general ADHD knowledge (Question 1-4), as depicted in Figure 6. After the experience, knowledge increased by about **3–10% across groups**, depending on their starting point. One month later, gains were slightly higher, reaching roughly **8–20% improvement compared to before the experience**. The increase was gradual, showing that the MR experience helped reinforce basic facts about ADHD, even though these questions focused on general information rather than immersive content.

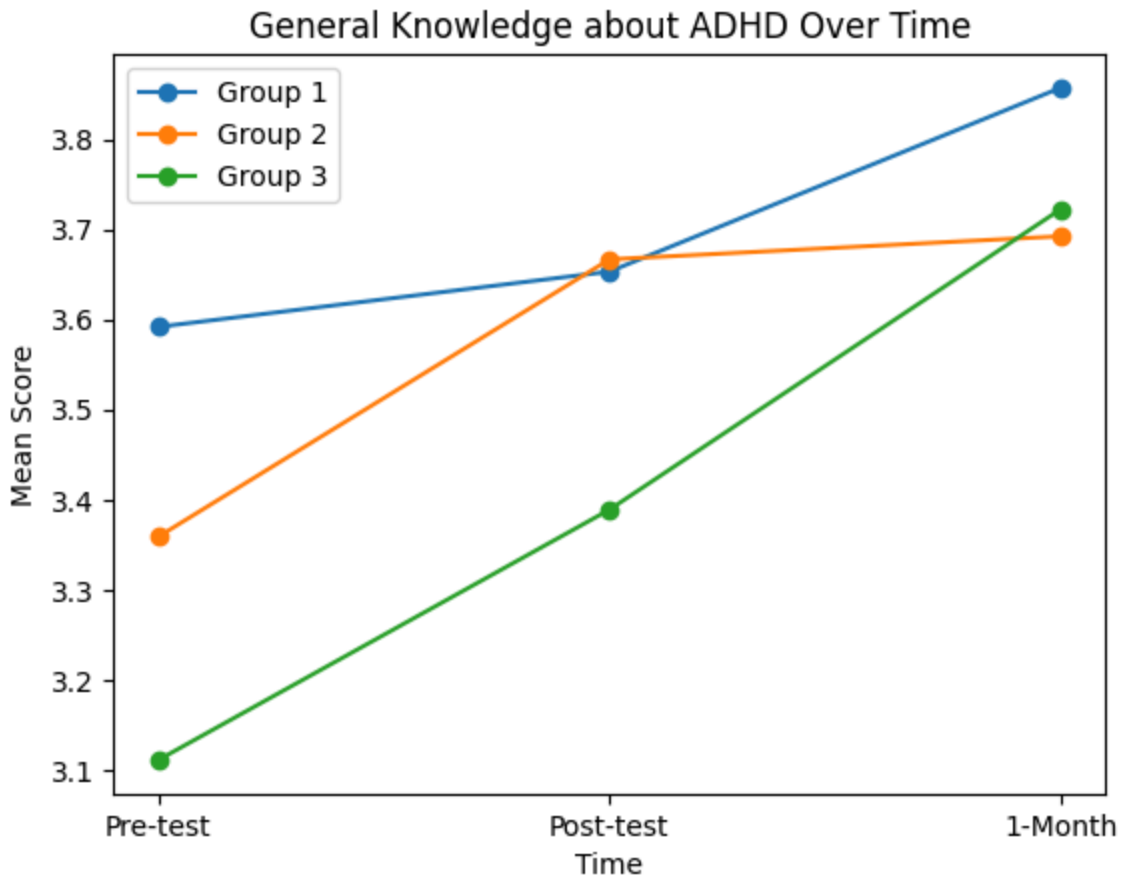


Figure 6. General Knowledge about ADHD over Time

MR-Based Knowledge about ADHD over time

Figure 7 shows much stronger effects of knowledge about ADHD learned through the immersive virtual reality (MR) experience. This MR-based knowledge about ADHD over time related to brain function, emotions, attention, and coping strategies increased by approximately **15–45%**, with the largest gains seen in participants who started with lower knowledge. One month later, most of this learning was retained, with scores remaining about **30–40% higher than before the experience**. This shows that the MR experience was particularly powerful in helping people understand how ADHD feels and works from the inside, and that this learning had a lasting impact. While general ADHD knowledge showed only modest improvement for Group 1 (participants with ADHD) and Group 3 (participants without ADHD and without close personal connections to ADHD), learning specifically about ADHD through the Mixed Reality experience resulted in much larger and more lasting gains for Group 1 and Group 2 (participants without ADHD but with a close family member

or friend with ADHD). Overall, both sets of knowledge assessments demonstrate the strong educational value of immersive Mixed Reality, with varying impact across different participant groups.

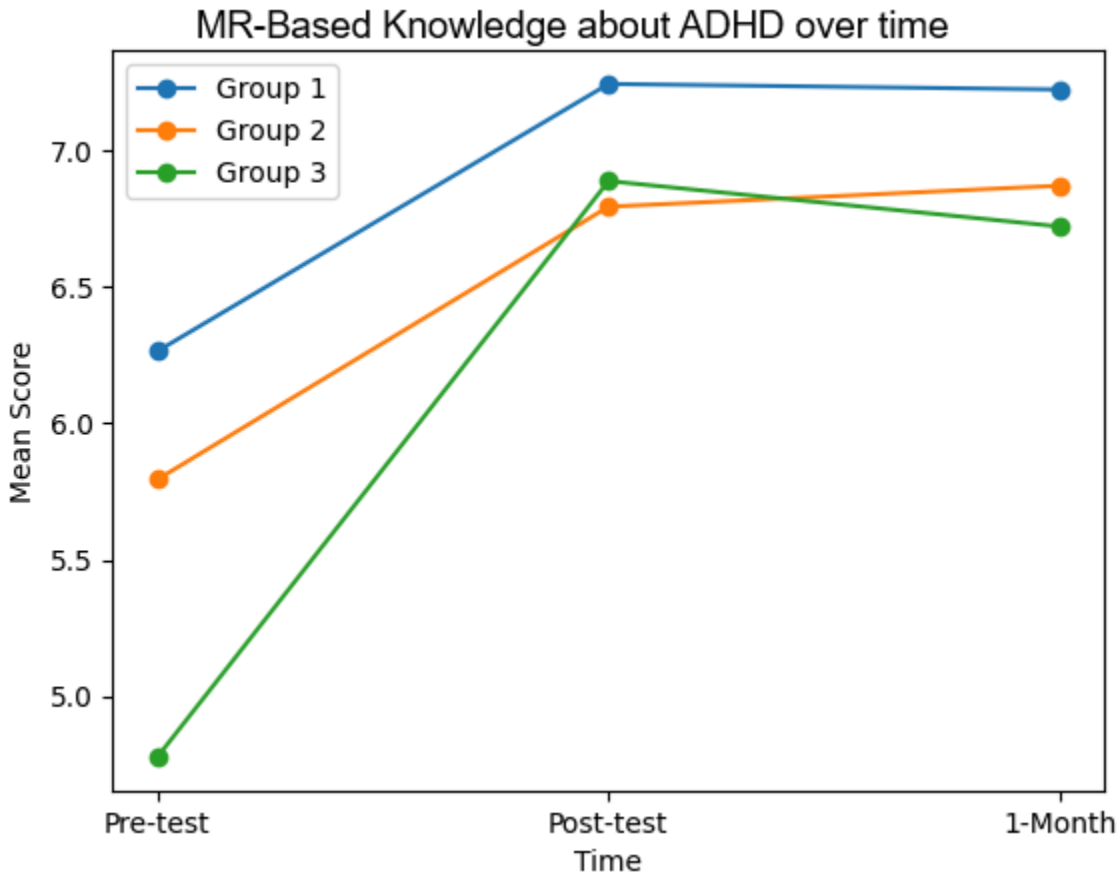


Figure 7. MR-Based Knowledge about ADHD over Time

11. Can a Mixed Reality (MR) Experience Help People Recognise Stigma Toward Others with ADHD?

We studied how watching the MR experience *Impulse* changed the way people think about others with ADHD over time, as presented in Figure 8

Before watching the experience, most participants showed moderate levels of stigma, but many were not aware that some of their attitudes were stigmatising. In simple terms, about 5–6 out of 10 people hold stigma patterns without realising it.

After watching *Impulse*, stigma scores increased slightly across all groups. This suggests that the experience helped people recognise stigma patterns they had not noticed before. At this stage, about 6–7 out of 10 people became more aware of how judgment and misunderstanding toward ADHD can happen.

One month later, stigma levels decreased again. This indicates that after becoming aware, people had time to reflect and adjust their attitudes. Around 6 out of 10 people showed lower stigma compared to immediately after the experience.

Differences between groups

- Group 3 (People with no direct connection to ADHD) showed the highest stigma overall. At all time points, about 7 out of 10 people in this group showed stronger stigmatising attitudes toward others with ADHD.

- Group 2 (People who know someone with ADHD) showed the largest change over time. After watching the MR experience, about 7 out of 10 people showed increased awareness of stigma, and one month later, 6–7 out of 10 people showed a stigma reduction. This suggests the MR experience had the strongest effect in this group.

- Group 1 (People with ADHD or who think they might have it) showed lower stigma overall, with about 4–5 out of 10 people showing stigma patterns and smaller changes over time, suggesting less room for improvement.

What does this mean?

The MR experience *Impulse* did not immediately reduce stigma for everyone. Instead, it helped people first recognise stigma—something many were not aware of

before. For many participants, especially in Group 2, this awareness was followed by a real reduction in stigma over time. In short, MR appears to work as a two-step process:

1. Awareness (recognising stigma)

2. Change (reducing stigma over time)

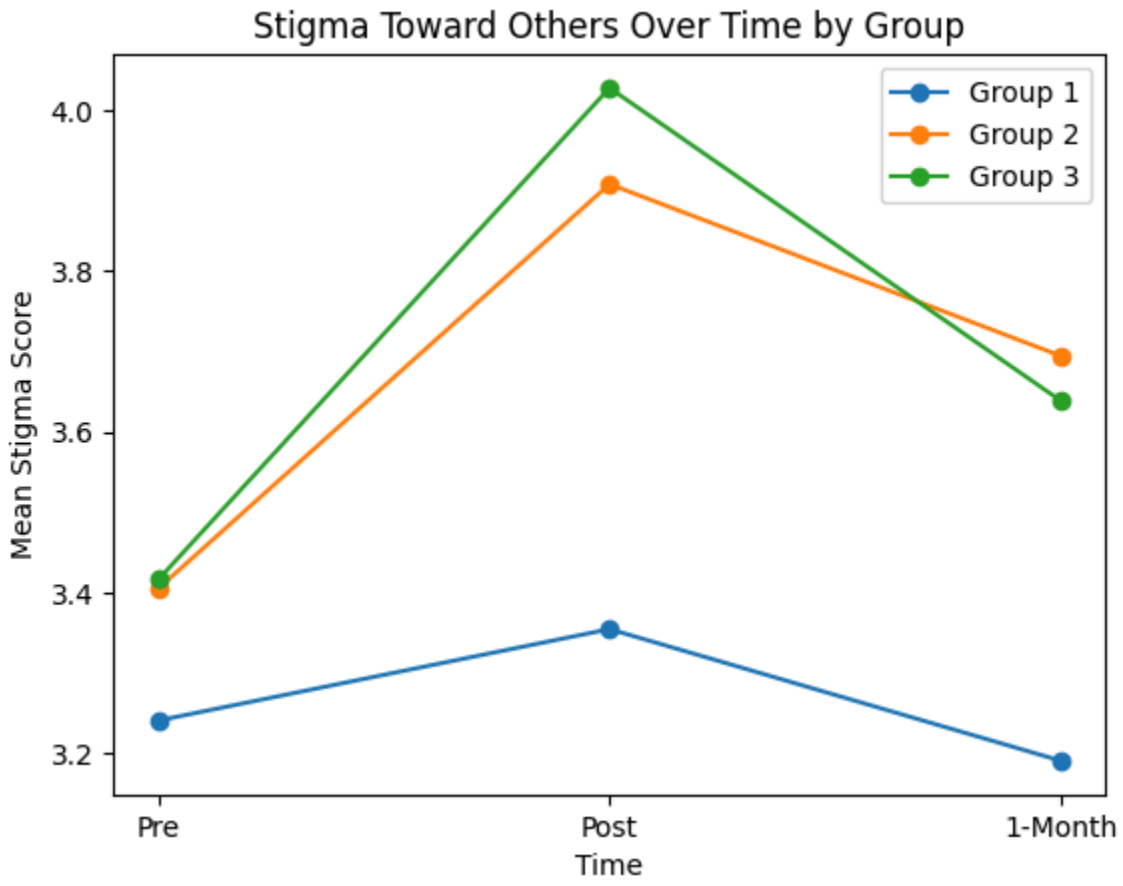


Figure 8. Stigma Toward Others Over Time by Group

12. How did participants with diagnosed or suspected ADHD change their attitudes and behaviours over time in treating themselves?

We found that people with ADHD or those who suspect they have ADHD showed meaningful changes in how they take care of themselves and seek support after watching Impulse. Participants reported their planned attitudinal and behavioural changes after experiencing the MR experience, and many had already taken action one month later. These findings suggest that the experience continues to influence decisions and behaviours well beyond the initial exposure, supporting ongoing self-care and help-seeking.

Help-seeking and support actions

Compared to immediately after the MR experience, more participants took steps to seek help one month later, as shown in Figure 9:

- Seeing a doctor or mental health professional increased from 29% to 39%. This suggests that some individuals needed time to process the experience before deciding to seek professional help and taking action.
- Talking to a school or work counsellor increased from 2% to 16%. 2% of the participants also reported planning to discuss their ADHD at school or work, and this behaviour showed a significant increase to 16% after one month.
- Taking other helpful actions (such as personal planning or informal support) increased from 22% to 39%. This shows that people explored different ways to support themselves over time.

What this means:
Help-seeking often doesn't happen immediately. MR Experience: Impulse appears to encourage people to take action gradually, once they have had time to reflect.

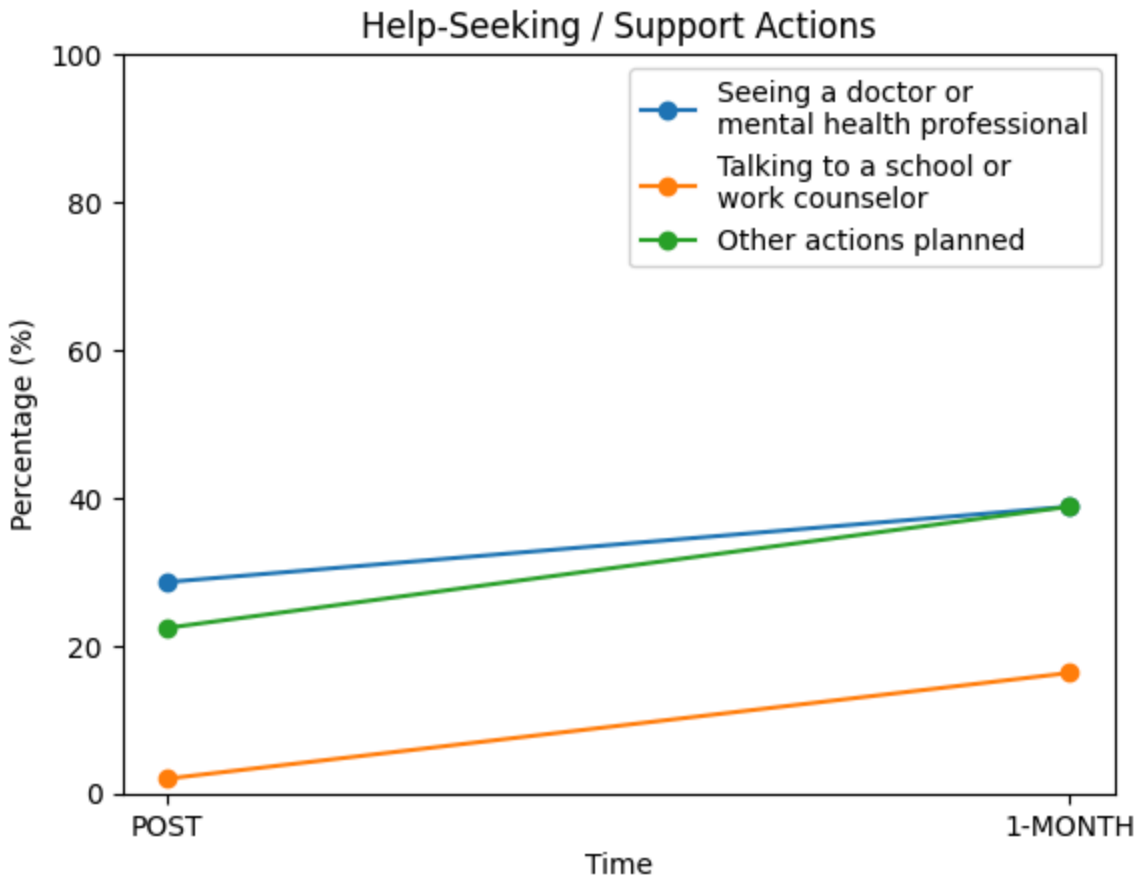


Figure 9. Behavioural Change in themselves about help-seeking and support actions Over Time by Group

Self-Education and Awareness

As illustrated in Figure 10, the greatest and most consistent change was in Self-Education and Awareness:

- Reflecting on personal behaviours and habits related to ADHD increased from 82% to 92%. Nearly everyone reported ongoing self-reflection one month later.
- Other self-education actions increased slightly from 6% to 8%. While fewer people pursued formal learning, some continued exploring ADHD in their own ways.

MR Experience Impulse appears to have a lasting impact on how people understand themselves, helping participants better recognise their behaviours and needs over time.

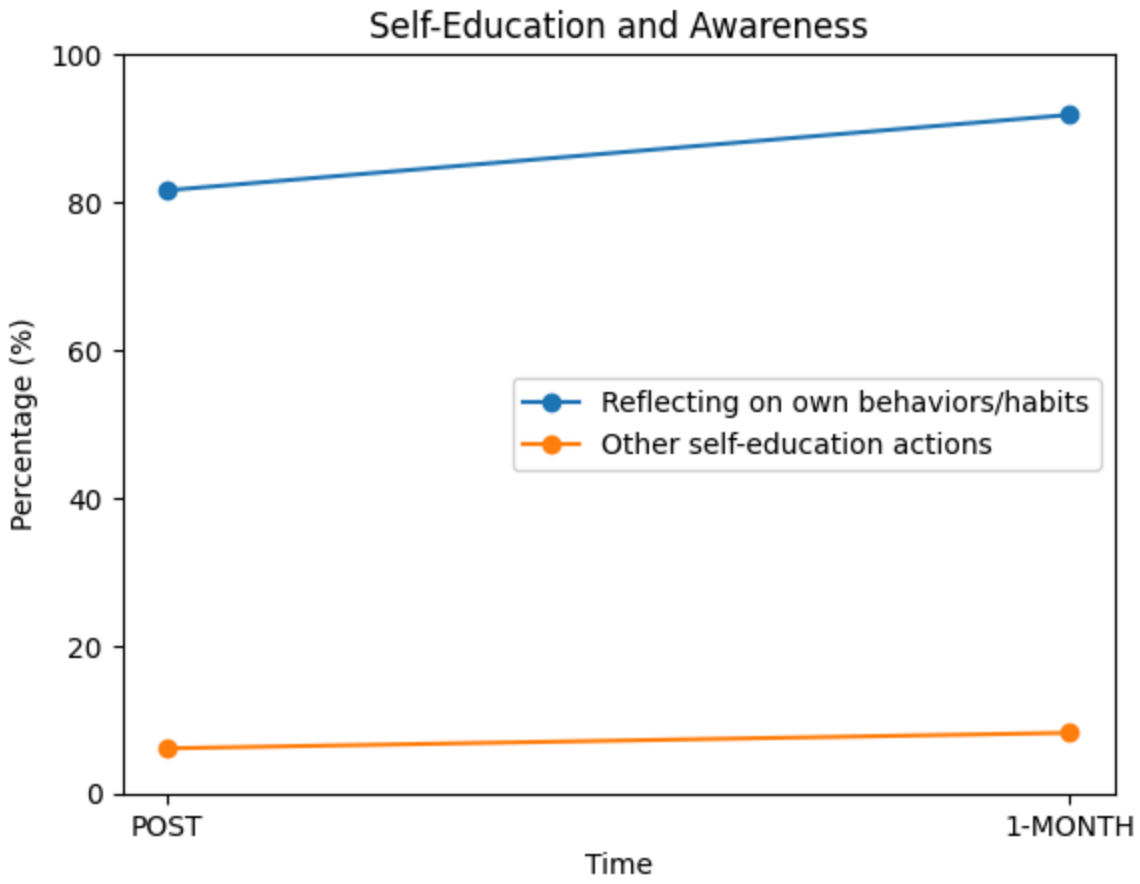


Figure 10. Behavioural Change in themselves about self-education and awareness actions Over Time by Group

We spoke to a number of study participants on camera right after they had experienced Impulse.

Watch the film (3m32s) here to see their reactions.

13. Does the MR Impulse experience encourage positive behaviour toward individuals with ADHD immediately after participants engage with the experience?

The Mixed Reality (MR) experience *Impulse* promoted more positive behavioural intentions toward others immediately after participation. Across the 118 participants who completed the pre- and post-tests, increases were observed in several positive behavioural actions, including greater support, patience, communication, education, and proactive guidance related to ADHD. Specifically, participants reported stronger intentions to:

- Be more supportive and understanding toward friends, colleagues, or others with ADHD (increase from 87 to 91 responses).

- Be more patient with people with ADHD in their immediate environment (increase from 63 to 83 responses).

- Open conversations with family members or others about ADHD (increase from 47 to 73 responses).

- Educate others (family, friends, or colleagues) about ADHD (increase from 47 to 72 responses).

In addition, post-test intentions reflected increased proactive behaviours related to guidance and support, including:

- Encouraging others to seek professional help for ADHD (increase from 61 to 74 responses).

- Providing information about ADHD assessment or support services (increase from 37 to 54 responses).

- Feeling confident guiding others to ADHD-related resources (increase from 36 to 74 responses).

- Reflecting on whether someone could benefit from assessment or support (increase from 65 to 75 responses).

Participants also demonstrated greater awareness of everyday supportive actions, such as:

- Noticing and responding when someone with ADHD is struggling (increased from 82 to 96 responses).

- Adjusting communication or environments to help someone with ADHD succeed (increase from 73 to 87 responses).

- Making small behavioural changes in daily interactions to reduce challenges (increase from 53 to 75 responses).

- Feeling empowered to make a positive difference through simple actions (increase from 43 to 71 responses).

These behavioural improvements are consistent with the trends shown in Figure 11, where all groups demonstrated increased mean scores from pre-test to post-test. The greatest impact was observed in Group 2 (participants without ADHD but with close personal contact with someone with ADHD), who showed the largest increase in mean behavioural change scores following the MR experience. This group demonstrated strong gains across multiple positive actions, such as encouraging professional help, providing information about ADHD resources, and adjusting daily behaviours to support others.

Group 3 (participants with no prior contact with ADHD) also showed substantial improvements, indicating that the MR experience was particularly effective in increasing awareness and motivating positive intentions among participants with limited or no prior familiarity. In contrast, Group 1 (participants with ADHD) exhibited smaller changes, likely due to higher baseline levels of understanding and supportive behaviours before the intervention, resulting in a ceiling effect.

Overall, the findings indicate that the *Impulse* MR experience is especially effective for individuals without ADHD, with the strongest impact seen in those who already have indirect exposure through close relationships (Group 2). The experience successfully translates increased understanding into concrete, positive behavioural intentions toward individuals with ADHD.

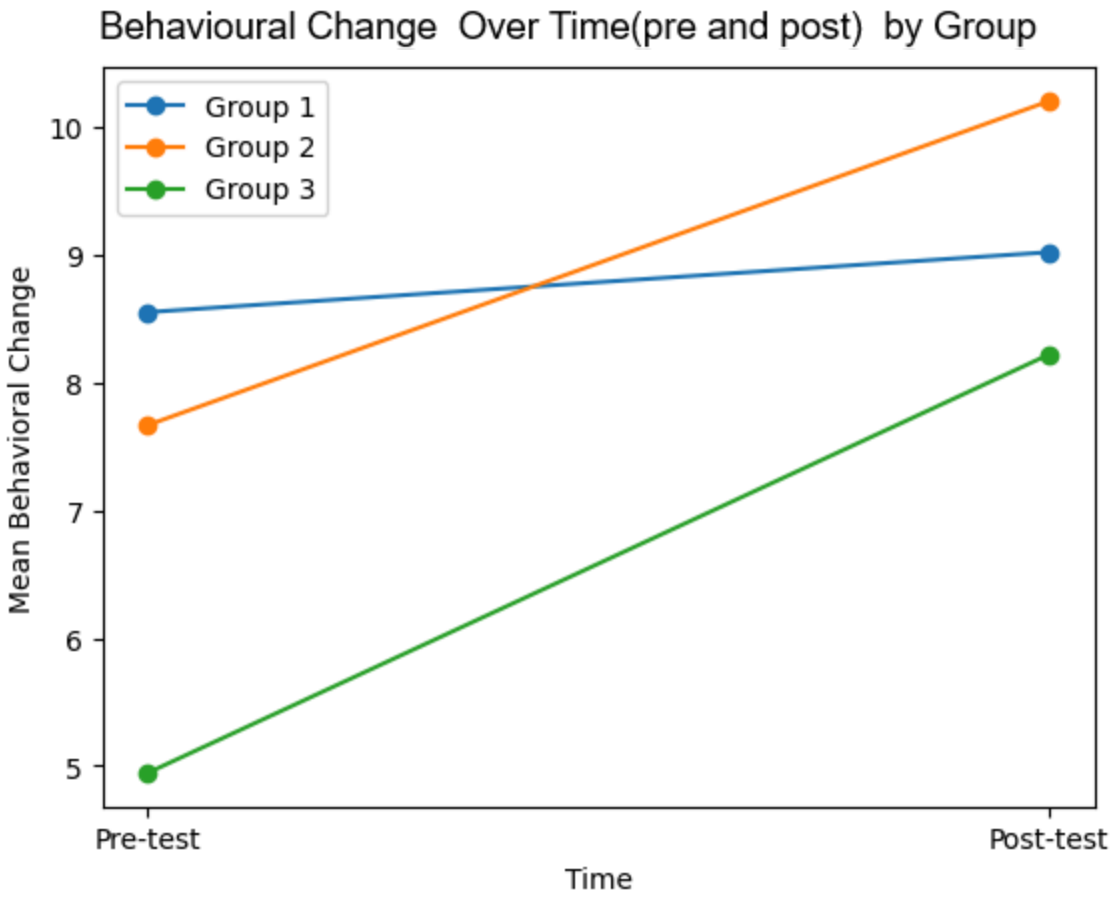


Figure 11. Behavioural Change toward others with ADHD Over Time (pre and post) by Group

14. Which attitudes and behaviours toward individuals with ADHD change over time?

The Mixed Reality experience Impulse encouraged participants to behave more positively and supportively toward people with ADHD.

Before the MR experience, the most common behaviours that participants would consider were:

- Being supportive or understanding toward friends or colleagues with ADHD (34%).
- Being patient with family or people around them (24%).
- Talking with relatives about ADHD and educating others (both 18%).

After the MR experience, participants planned more positive actions:

- Supporting friends, colleagues, or others with ADHD (28%).
- Being patient with family or others (25%).
- Talking and educating about ADHD (22% each).

Opening Up and Speaking with Family About ADHD

As is illustrated in Figure 12, immediately after watching the Mixed Reality experience *Impulse*, many participants said they planned to talk openly with family members about ADHD. This included 67.3% of Group 1 (people with ADHD or who think they might have it) and 76.3% of Group 2 (people who know someone with ADHD). In comparison, 27.8% of Group 3 (people with no direct connection to ADHD) reported this intention. One month later, the follow-up showed that this intention turned into action mainly for Group 3, where the percentage increased to 38.9%. In contrast, follow-through decreased for Group 1, dropping to 46.9%, and declined sharply for Group 2, falling to 26.3%. This suggests that the most positive behavioural change for this action occurred among participants with no prior personal connection to ADHD.

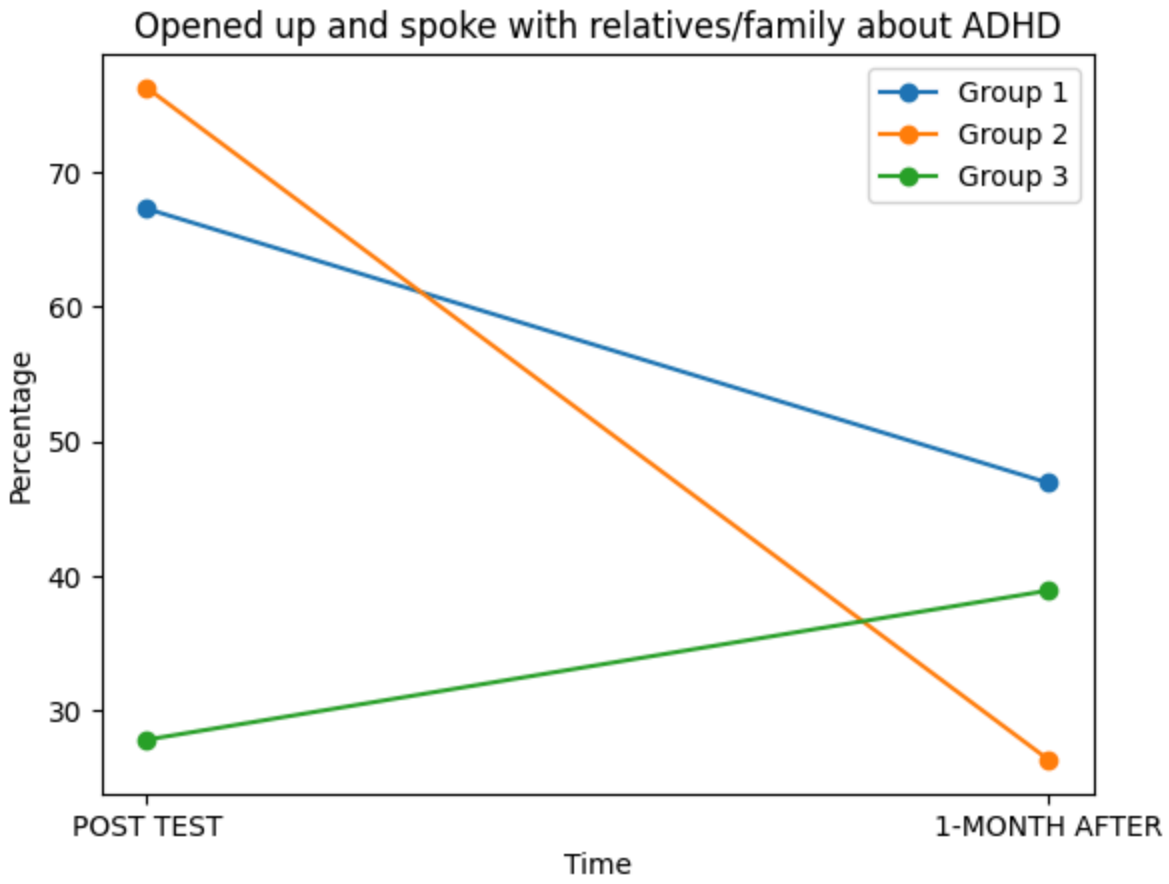


Figure 12. Opening up and speaking with family about ADHD over time by Group

Encouraged others to seek professional help

In the post-test (immediately after watching MR experience), shown in Figure 13, participants across all groups reported that they planned to encourage others with ADHD to seek professional help, including 57.1% of Group 1 (people with ADHD or who think they might have it), 63.2% of Group 2 (people who know someone with ADHD), and 55.6% of Group 3 (people with no direct connection to ADHD). At the one-month follow-up, only Group 1 showed a positive change, increasing to 61.2%, indicating that more participants with lived experience of ADHD actually took this action. Meanwhile, the percentage declined in Group 2 to 47.4% and in Group 3 to 44.4%. These results suggest that sustained behavioural change in encouraging professional help toward others who have ADHD was strongest among participants who personally experienced ADHD.

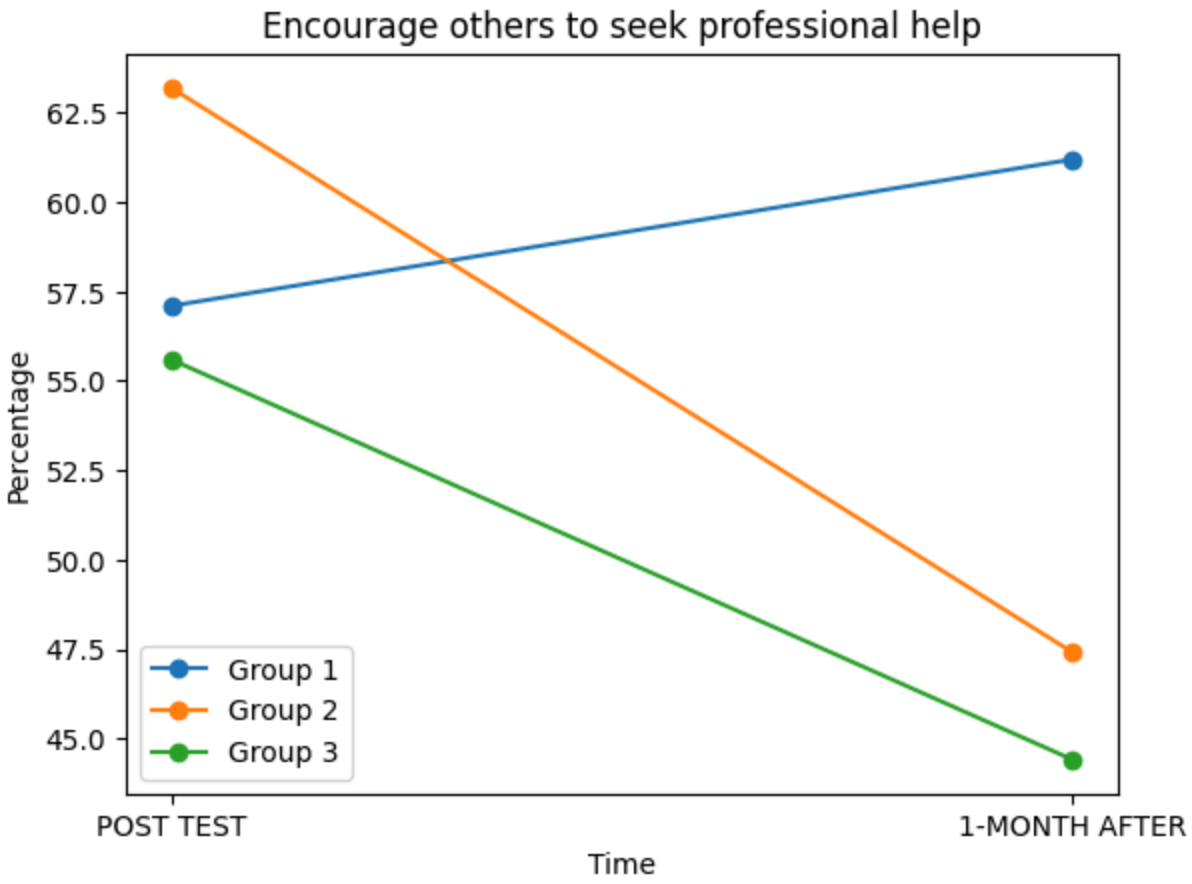


Figure 13. Encourage others with ADHD to seek professional help over time by Group

Planned to reflect on others' needs

Immediately after the Mixed Reality experience, as is shown in Figure 14, participants in all three groups reported strong intentions to reflect more on the needs of others with ADHD. One month later, this attitude was largely maintained. Groups 1 and 2 showed a small positive increase, indicating that more participants continued or strengthened this reflective attitude over time. Group 3 remained stable, showing consistently high percentages at both time points. This suggests that the experience supported a lasting positive attitudinal change in all groups, with slight improvements in Groups 1 and 2.

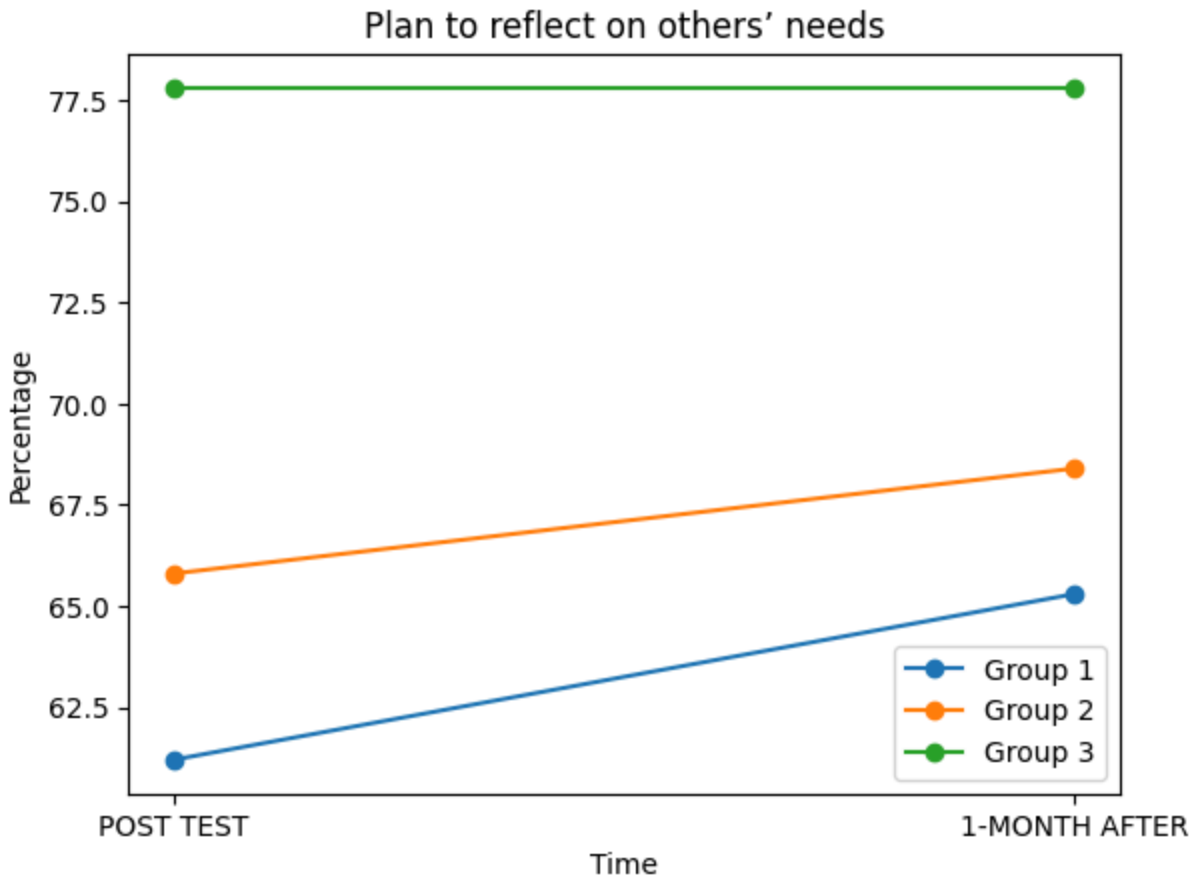


Figure 14. Plan to reflect on others' needs with ADHD over time by Group

Believed that suggesting professional help can improve outcomes

Immediately after the Mixed Reality experience, participants showed moderate belief that suggesting professional help could improve outcomes for people with ADHD, as illustrated in Figure 15. At the one-month follow-up, all three groups demonstrated a clear positive change, with higher percentages across the board. The strongest increase was seen in Group 3, followed by Groups 1 and 2. This indicates that the Mixed Reality experience had a lasting positive impact on beliefs, strengthening participants' confidence in the value of professional support for ADHD.

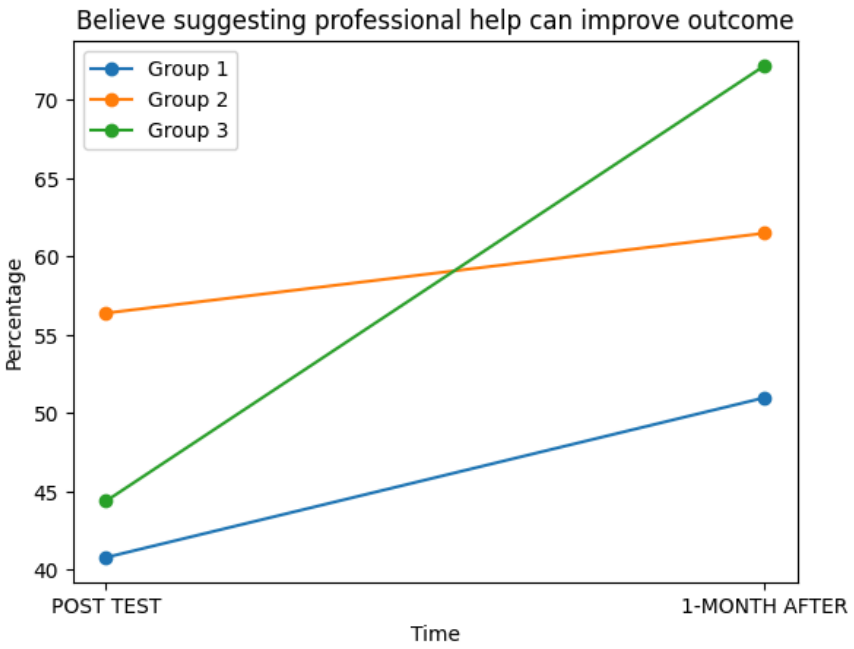


Figure 15. Believe suggesting professional help to people with ADHD can improve outcome over time by Group

Behavioural Changes in Percentages

To sum up, after participating in the MR experience, participants showed positive changes in how they planned to support others with ADHD over the following month. For those who have ADHD or believe they may have ADHD (Group 1), 10% more participants reported planning to suggest professional help to others, and 14% more reported engaging in other supportive actions. This suggests that the experience encouraged them to think proactively about helping others over time.

Participants who have a close family member, friend, or work with people with ADHD (Group 2) also reported a small increase (+5%) in planning to seek professional help one month after the experience. While smaller than in other groups, it still indicates a continued intention to support others in a meaningful way.

For participants without ADHD and no close connection to someone with ADHD (Group 3), the most notable changes were observed. Over one month, 11% more participants reported planning to open up and talk about ADHD, and 28% more participants planned to suggest professional help. This indicates that even individuals with little prior exposure to ADHD can develop supportive behaviours after the MR experience, and the effect may strengthen over time.

15. What Other Ideas Did Participants Have to Support People with ADHD Before and After the MR Experience?

Immediately after and one month after watching the mixed reality experience Impulse, a few participants reported and recommended additional ways they tried to support people with ADHD:

- **Encourage healthy habits and alternatives** – Meditation, mindfulness, and some natural supplements can help manage ADHD symptoms.
- **Create accountability and support systems** – Work together with colleagues, friends, or family to help each other stay on track.
- **Advocate for better services** – Speak up about issues in assessment, treatment, and support systems so they can improve.
- **Promote understanding at work** – Encourage workplaces to provide better support for neurodivergent employees.
- **Learn about ADHD** – Educate yourself to understand the challenges others face and how to support them.
- **Share helpful resources** – Suggest online resources, therapy options, or coping strategies when appropriate.
- **Provide a safe space to talk** – Be open, inclusive, and non-judgmental so people feel comfortable sharing their experiences.
- **Talk openly about ADHD** – Normalising conversations reduces stigma and helps others feel understood.
- **Respect boundaries around advice** – Only suggest treatment or resources if someone asks; avoid giving unsolicited medical advice.
- **Avoid assuming or labelling** – Don't try to diagnose others; everyone's experience is unique.
- **Support through awareness and empathy** – Sometimes simply understanding and acknowledging someone's challenges can make a big difference.

16. Which Group Showed Higher Levels of Empathy Toward People with ADHD?

Overall, empathy toward people with ADHD was very high across all participants. On a scale from 1 ("not at all") to 5 ("very much"), average empathy scores were above 4.3 out of 5, which corresponds to over 85% of the maximum possible score. Affective empathy (feeling concern and compassion) was the highest, reaching an average of 90%, followed by total empathy (89%) and cognitive empathy (87%).

As is illustrated in Figure 16, when comparing groups, emotional (affective) empathy showed meaningful differences. People who had ADHD themselves reported the highest emotional empathy, ranking about 15–20% higher than people with no ADHD and no close contact with someone with ADHD. Those who had close personal or professional experience with people with ADHD showed moderate levels of emotional empathy, falling between the other two groups. In contrast, people with no ADHD and no close exposure showed the lowest emotional empathy, although their empathy levels were still generally high.

Importantly, understanding-related empathy (cognitive empathy) and overall empathy were similar across all groups, with no meaningful differences. This means that most people—regardless of their background—reported a strong ability to understand the challenges faced by individuals with ADHD. However, personal experience with ADHD appears to increase emotional connection and compassion, rather than general understanding.

In particular:

- The group showed the highest emotional (affective) empathy, meaning they felt more concern and compassion for people with ADHD than the other groups.
- The group with close personal or professional experience (family members, friends, teachers, caregivers) showed the second-highest empathy levels.
- Participants with no ADHD and no close contact had the lowest levels of empathy, although their empathy was still generally high overall.

In summary, direct personal experience with ADHD is associated with the strongest empathy toward others with ADHD, especially at an emotional level.

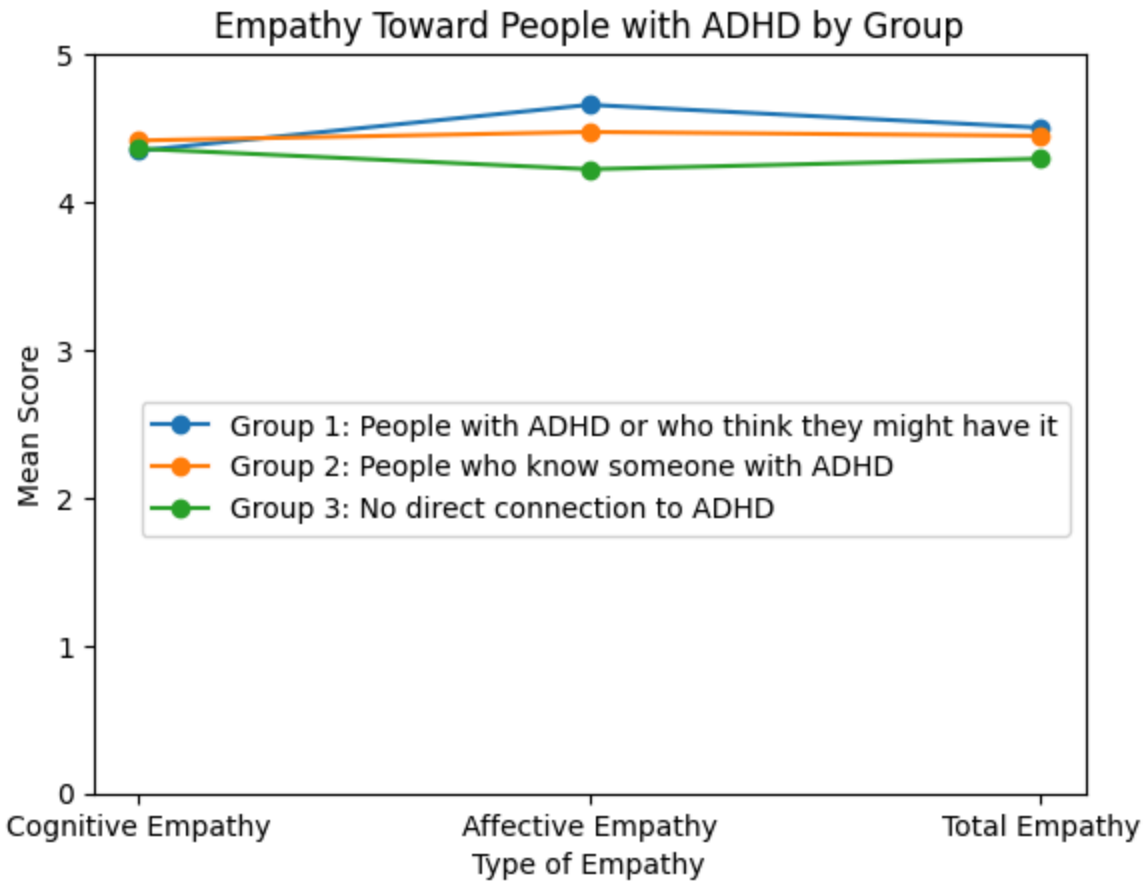


Figure 16. Empathy Toward People with ADHD by Group

17. What is the relationship between empathy and behaviour change toward people with ADHD?

The more empathy people feel—especially understanding what it is like to live with ADHD, the more positively and supportively they behave toward people with ADHD.

The results in Table 5 show a clear and significant relationship between empathy and behaviour toward people with ADHD.

- People with higher overall empathy showed about 50% more positive behaviour immediately after the experience and about 36% more positive behaviour one month later.
- Understanding empathy (cognitive empathy) had the strongest effect:
    - 47% stronger positive behaviour right after
    - 37% stronger positive behaviour one month later
- Emotional empathy (affective empathy) was also important:
    - 42% stronger positive behaviour immediately
    - 27% stronger positive behaviour one month later

These findings mean that when people both understand and emotionally connect with the experiences of individuals with ADHD, they are more likely to act with patience, respect, and support—not just in the moment, but over time.

Table 5. Relationship between Empathy and Behavioural Change toward people with ADHD (N=106)

Type of Empathy	**Positive Behaviour Immediately After**	**Positive Behaviour 1 Month Later**	**What This Means**
Affective Empathy (Feeling)	ρ = **.423** (≈ **42%**)	ρ = **.266** (≈ **27%**)	Emotional connection leads to kinder behaviour, especially right after
Cognitive Empathy (Understanding)	ρ = **.471** (≈ **47%**)	ρ = **.372** (≈ **37%**)	Understanding ADHD creates stronger, longer-lasting behaviour change
Total Empathy (Overall)	ρ = **.505** (≈ **51%**)	ρ = **.358** (≈ **36%**)	Higher overall empathy strongly predicts positive behaviour over time

18. How Immersed Did Participants Feel in the MR Experience Impulse?

Participants were asked how immersed or engaged they felt during the Virtual Reality Experience Impulse. Immersion means how much the experience felt real, engaging, or "you were inside it". As is displayed in Figure 17, participants across all three groups reported similar and moderately high levels of immersion in the Mixed Reality experience. People with ADHD or who thought they might have ADHD (Group 1) reported an average immersion score of about 3.4 out of 5, indicating that the experience felt engaging and absorbing. People who knew someone with ADHD, such as a family member, friend, or colleague (Group 2), reported a very similar level of immersion, with an average score of around 3.3. Participants with no prior personal connection to ADHD (Group 3) reported the highest average immersion, at approximately 3.5 out of 5.

Overall, the small differences between groups suggest that the Mixed Reality experience was consistently immersive for all participants, regardless of their background or previous familiarity with ADHD. This indicates that the experience was broadly accessible and engaging, even for people who had little or no prior exposure to ADHD.

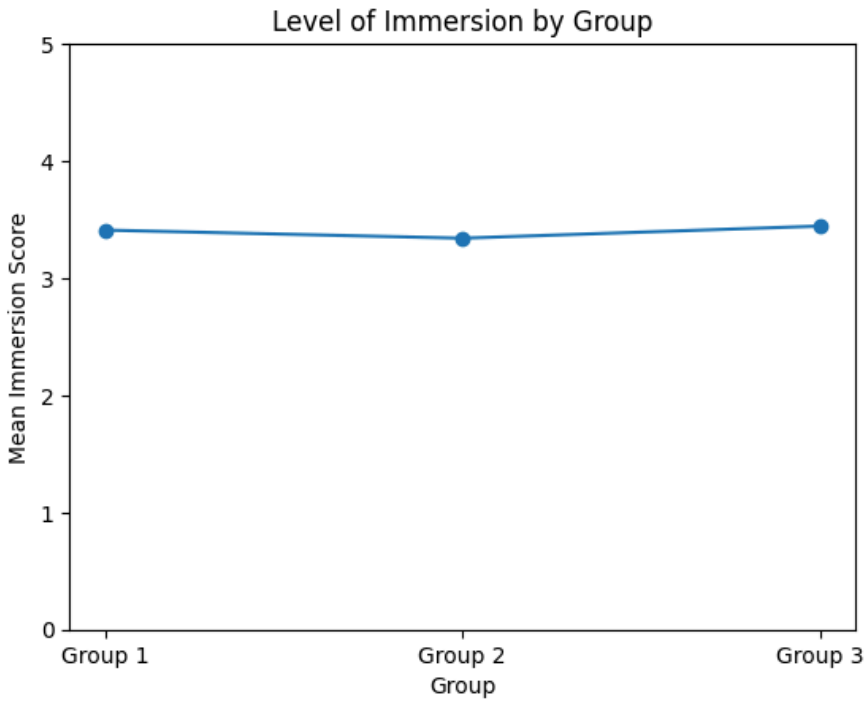


Figure 17. Immersion or Engagement Level Toward the MR Experience Impulse by Group

After the Mixed Reality *Impulse* experience, participants were asked a direct question on a scale from 1 to 5: *"How immersed or engaged did you feel during the experience?"* A total of 118 participants responded, as is shown in Figure 18.

The results show that most participants felt engaged. Nearly four out of ten participants (39.8%, or 47 people) said they *strongly agreed* that they felt immersed and engaged, indicating a very high level of involvement. An additional 49.2% (58 participants) *agreed* that they felt immersed, showing a moderate but positive level of engagement. Together, this means that almost nine out of ten participants (89.0%) reported feeling at least moderately immersed in the experience.

A smaller group, 7.6% (9 participants), selected *neutral*, suggesting uncertainty about how immersed they felt. Only 3.4% (4 participants) *disagreed*, indicating that very few participants did not feel engaged.

Overall, the results show that the Mixed Reality *Impulse* experience was highly engaging. A total of 89.0% of participants reported feeling immersed or strongly immersed in the experience (49.2% agree + 39.8% strongly agree). This means that nearly 9 out of every 10 participants experienced a clear sense of engagement. Only 7.6% felt neutral, and a very small proportion, 3.4%, reported not feeling engaged. In percentage terms, this demonstrates that the experience was effective in creating immersion for the vast majority of participants, an important factor for promoting empathy and positive attitudes toward people with ADHD.

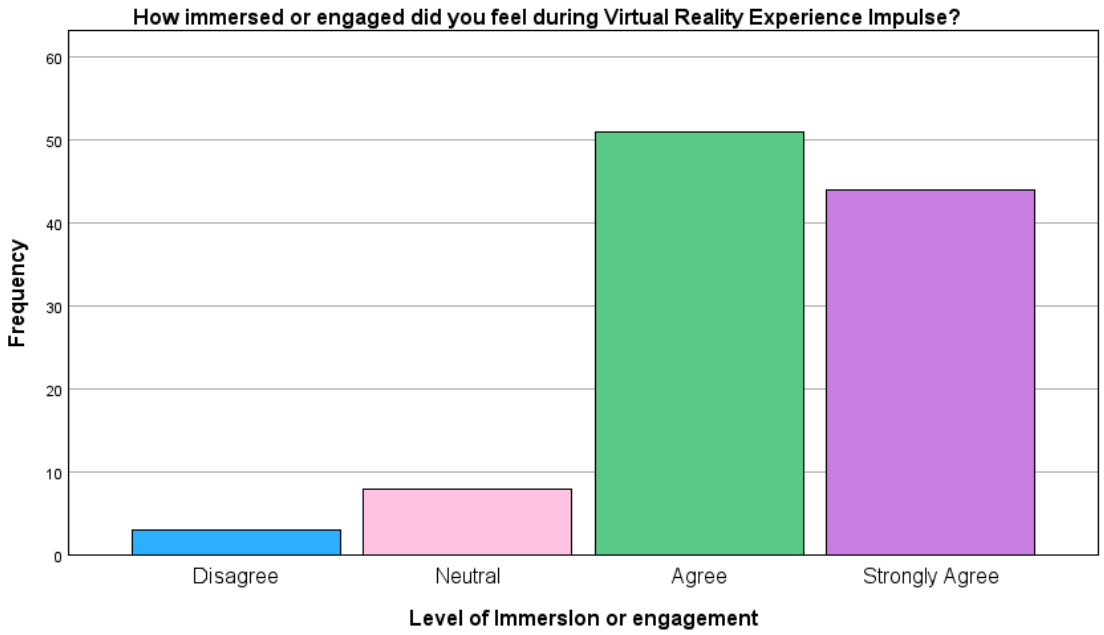
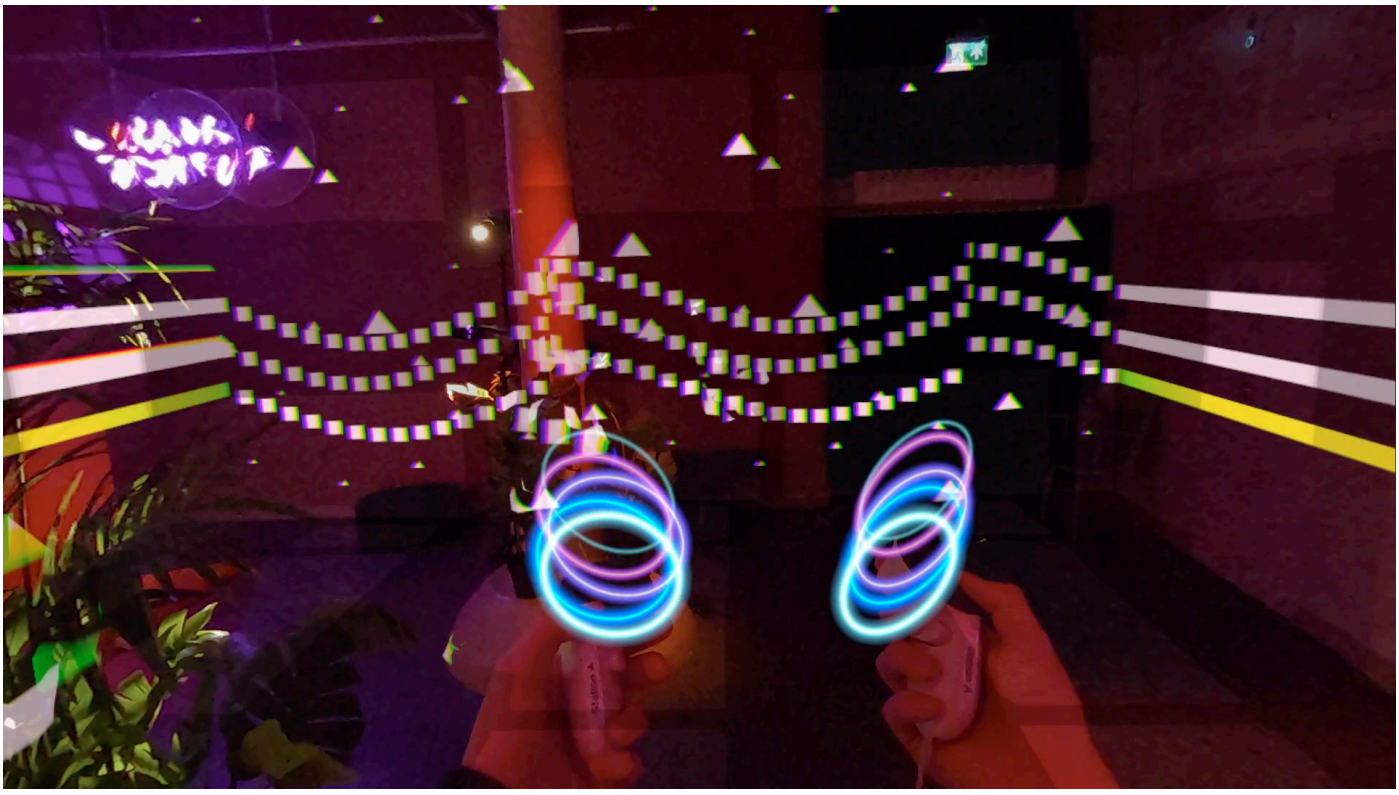


Figure 18. Immersion or Engagement Level Toward the MR Experience Impulse in general



POV and Gameplay: Moments in Impulse designed to reflect the sense of overwhelm described by interviewees with ADHD during development.

Conclusions

Key Findings from MR Experience: Impulse

1. The Mixed Reality Experience *Impulse* Improves Knowledge About ADHD

Engagement with the Mixed Reality (MR) experience *Impulse* increased ADHD knowledge across all three participant groups immediately after the intervention, with gains largely maintained one month later. Participants with ADHD showed the highest knowledge levels at all time points, while participants with no prior connection to ADHD exhibited the largest learning gains from pre-test to post-test. Overall, *Impulse* effectively supported both immediate and sustained learning, demonstrating the educational potential of immersive MR experiences for complex topics such as ADHD.

2. Learning About ADHD Using the Mixed Reality Experience *Impulse*

Overall, the Mixed Reality *Impulse* experience led to measurable increases in ADHD knowledge. General knowledge improved modestly, with gains of 3–10% immediately after the experience and 8–20% one month later, showing gradual reinforcement of basic facts. In contrast, MR-based knowledge about ADHD increased much more strongly, with gains of 15–45%, and 30–40% of this improvement was retained after one month. These findings show that Mixed Reality is especially effective for teaching how ADHD works and feels, producing stronger and longer-lasting learning than general information alone.

3. Impulse Increases Awareness of ADHD Stigma and Supports Attitude Change Over Time

Impulse helped participants first recognise and then reduce stigma toward people with ADHD. Before the experience, about 50–60% of participants showed stigma without realising it; immediately after, 60–70% became aware of these attitudes, and one month later, around 60% showed lower stigma levels. The greatest positive change was seen in Group 2 (people who know someone with ADHD), while Group 3 showed the highest stigma overall, and Group 1 showed lower stigma with smaller changes.

4. Impulse Encourages Ongoing Self-Care and Support-Seeking Among People with ADHD

After experiencing *Impulse*, participants with diagnosed or suspected ADHD showed clear increases in self-care behaviours over time, including seeking professional help (29% to 39%), talking to school or work counsellors (2% to 16%), and taking other supportive actions (22% to 39%). Self-awareness was especially strong, with

reflection on personal behaviours rising from 82% to 92% one month later, showing that the experience supported lasting self-understanding and gradual action.

5. Immediate Behavioural Change Toward Others with ADHD After Impulse

Immediately after the *Impulse* Mixed Reality experience, participants reported increased supportive behaviours toward others with ADHD, including greater patience (63 to 83 responses), more open communication (47 to 73), and stronger confidence in guiding others to support resources (36 to 74). The largest behavioural gains were observed in Group 2 (people who know someone with ADHD), followed by Group 3, while Group 1 showed smaller changes due to higher baseline support.

6. Changes in Attitudes and Behaviours Toward Others with ADHD One Month After Impulse

One month after the *Impulse* Mixed Reality experience, several supportive attitudes and behaviours toward people with ADHD were maintained or increased, showing that the impact extended beyond immediate intentions. Notably, participants with no prior connection to ADHD (Group 3) showed the strongest behavioural growth (up to 28% increase), while participants with ADHD (Group 1) sustained gains in encouraging professional help and reflective attitudes toward others.

7. New Ideas About Helping People with ADHD

After the *Impulse* Mixed Reality experience and at the one-month follow-up, participants shared additional ideas for supporting people with ADHD, such as encouraging healthy habits, creating accountability and support systems, advocating for better services, and promoting understanding at work and in everyday life. These ideas emphasised empathy, open communication, respect, and learning as meaningful ways to reduce stigma and provide support.

Even one month later, participants reported continuing or expanding these actions, showing that MR Experience: Impulse encourages both self-directed growth and meaningful support for others in everyday life.

8. Empathy Toward People with ADHD Was High Across All Groups

Overall empathy toward people with ADHD was very high across all participants, averaging above 4.3 out of 5 (over 85%), with emotional empathy reaching about 90%. Participants with ADHD showed the highest emotional empathy, followed by those with close personal or professional contact, while those with no direct connection showed slightly lower—but still high—empathy levels, indicating that personal experience mainly strengthens emotional connection rather than understanding.

9. Impulse Shows That Empathy Is Key to Behaviour Change Toward People with ADHD

Participants with higher empathy showed substantially more positive behaviour toward people with ADHD, with about 50% stronger supportive behaviour immediately after the experience and 36% stronger behaviour one month later. Understanding ADHD (cognitive empathy) had the strongest and most lasting effect, showing that both emotional connection and understanding are critical for meaningful, sustained behaviour change.

10. Impulse Successfully Created a Strong Sense of Immersion for Most Participants

Participants across all groups reported moderately high and consistent immersion. Overall, 89% of participants reported feeling immersed or strongly immersed, showing that *Impulse* was broadly engaging and effective at creating a sense of presence for most users.

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