

UNDERSTANDING HOW PATIENT TRUST IN AUTOMATED INSULIN DELIVERY SYSTEMS RELATES TO IMPROVED DIABETES MANAGEMENT AMONG PEOPLE WITH TYPE 1 DIABETES

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BACKGROUND AND AIMS

Automated insulin delivery (AID) systems, which integrate insulin pumps and continuous glucose monitoring technologies with an algorithm that autonomously administers insulin, have become a standard part of care for individuals with Type 1 diabetes (T1). However, as a relatively new therapeutic option, the degree to which patients trust these systems remains underexplored. Although AID systems are designed to operate with minimal user intervention, some patients may harbor reservations about the algorithms controlling insulin adjustments and delivery. This study therefore sought to examine how patient trust in AID systems correlates with the perceived effectiveness of the system and the alleviation of diabetes management burden.

METHODS

In May of 2024, 1,503 T1 AID system users across the United States took an online survey in which they were asked to estimate the frequency with which they would review their AID Systems' response to a change in blood glucose (ranging from "never" to "every time"). Subjects also reported their HbA1c, the efficacy of their AID systems' algorithm (ranging from "significantly conservative" to "significantly aggressive"), cognitive benefits to their diabetes management associated with their AID system, and their overall satisfaction with their diabetes management resulting from the use of their AID system.

Self-reported Frequency of Verifying AID system Response

After noticing a change in their blood glucose

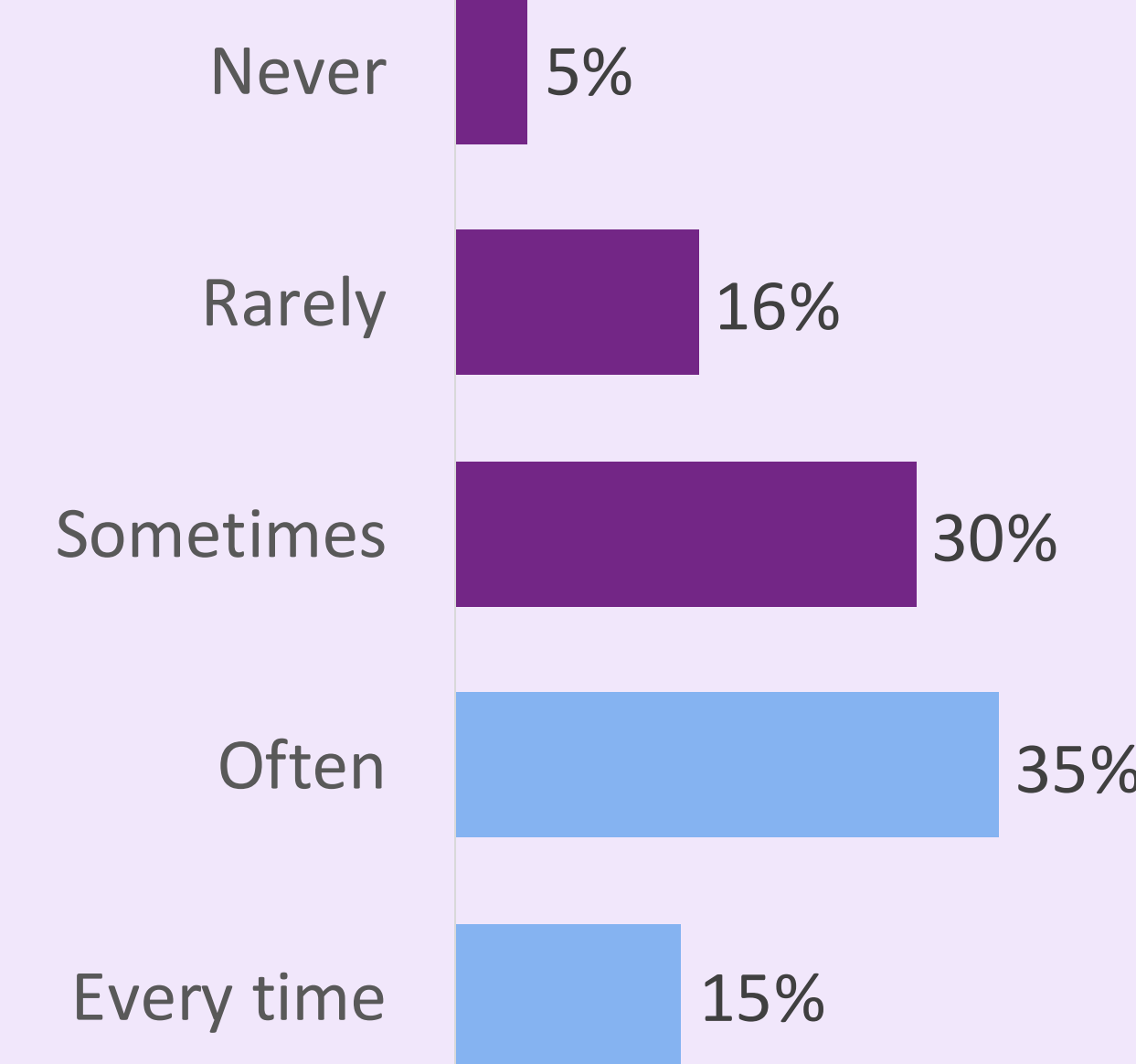


Figure 1. Categorization of respondents by AID system trust. Percentage of respondents who reported confirming the action of their AID system after a change in their blood glucose (n=1,503).

HbA1c Distribution by Reviewer Type

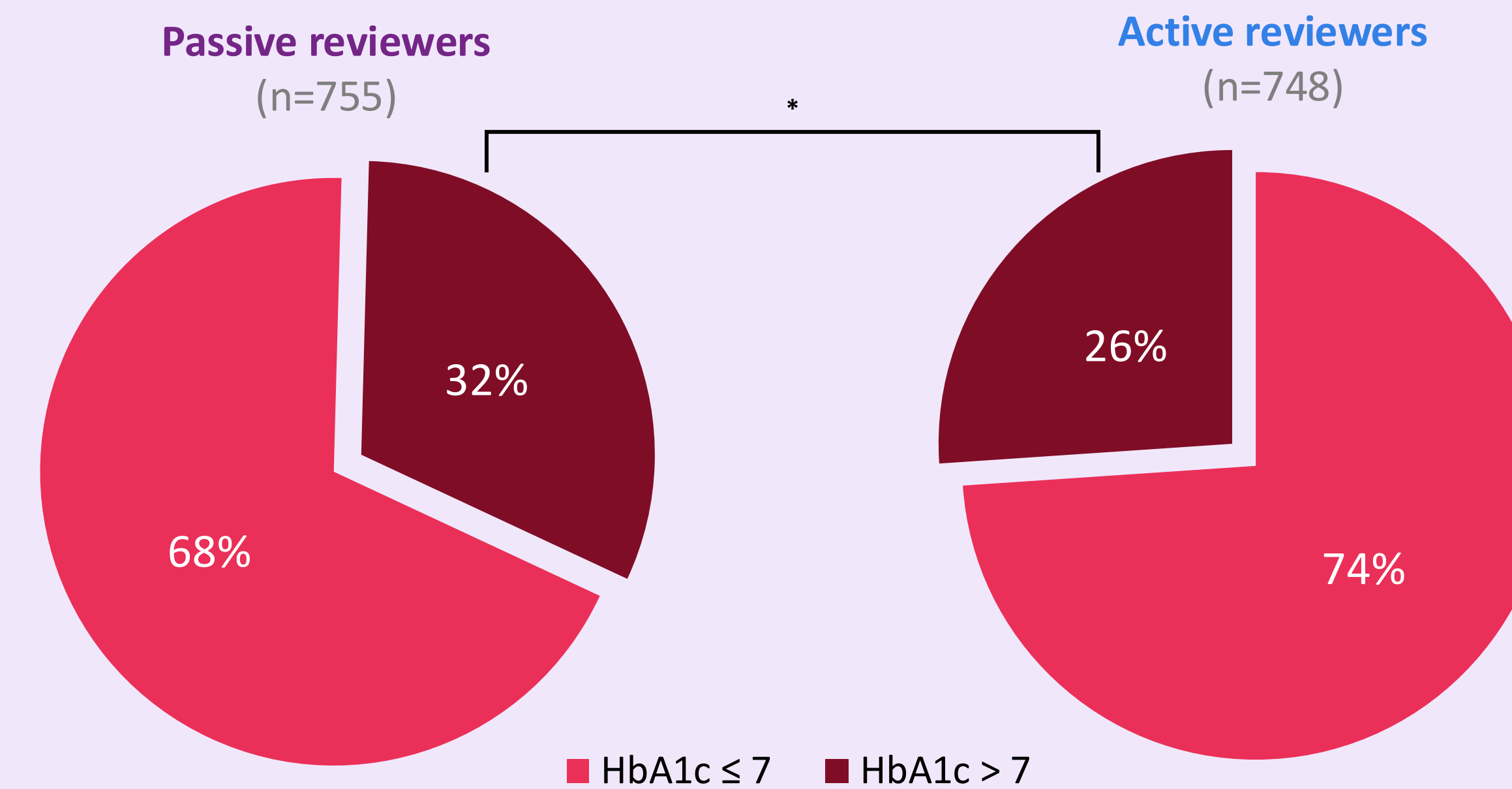


Figure 2. HbA1c Distribution by AID System Reviewer Type. Breakdown of self-reported HbA1c percentages based on the clinical recommendation of 7.0%. *p<.05.

AID System Algorithm Evaluation by Reviewer Type

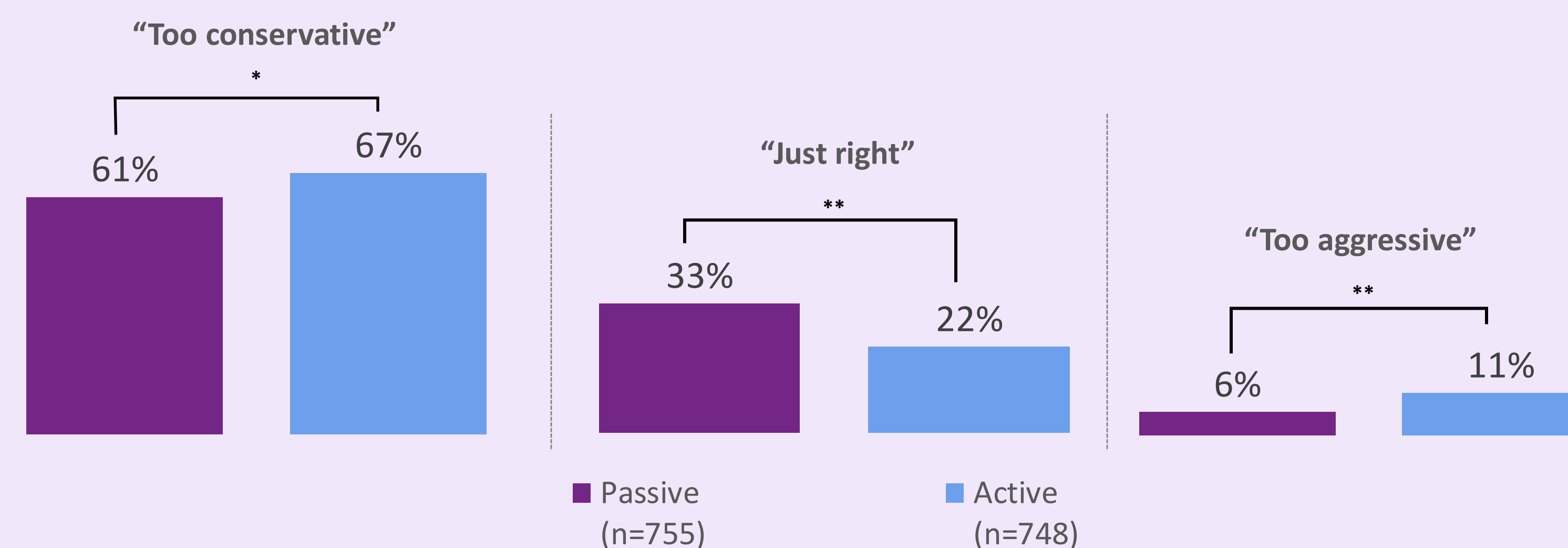


Figure 3. AID System Algorithm Evaluation by Reviewer Type. Evaluation of AID algorithm calculated as percentage of respondents selecting either "Significantly conservative" or "Somewhat conservative", "Just right", or either "Significantly aggressive" or "Somewhat aggressive." *p<.05. **p<.001

Cognitive Benefits of AID System by Reviewer Type

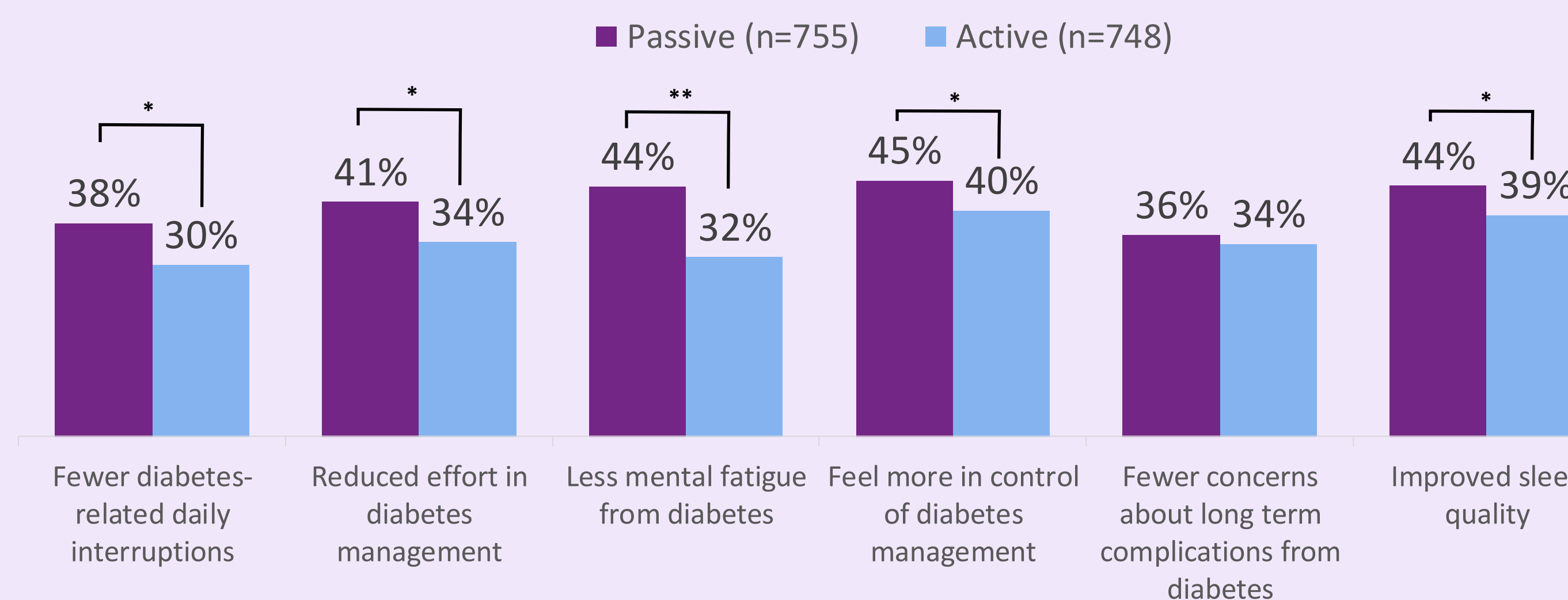


Figure 4. Cognitive Benefits Experienced from use of AID System by Reviewer Type. Calculated as a percentage of respondents selecting a 9 or 10 on a 10-point agreement scale regarding the following cognitive benefits experienced from the use of their AID system. *p<.05. **p<.001

Satisfaction with Diabetes Management while using AID System by Reviewer Type

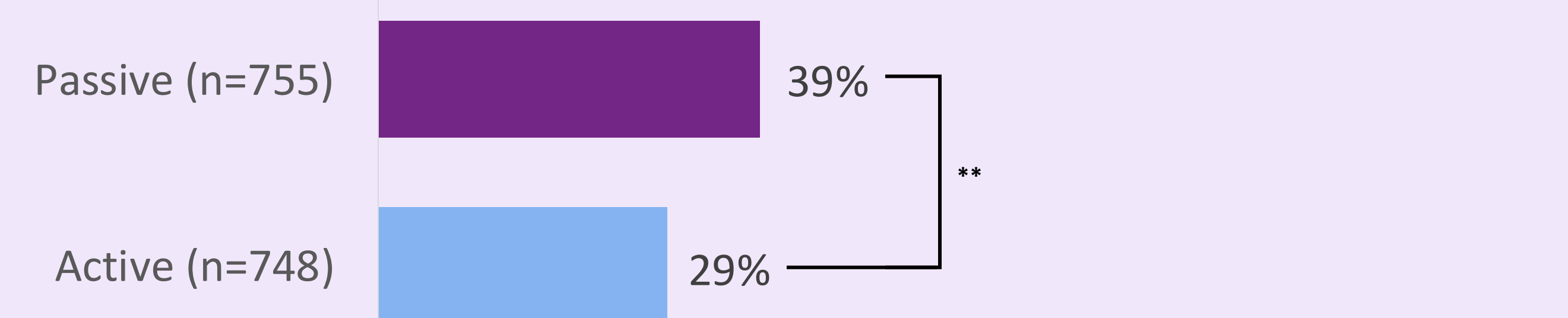


Figure 5. Satisfaction with Diabetes Management while using AID System by Reviewer Type. Calculated as a percentage of respondents selecting a 9 or 10 on a 10-point satisfaction scale. **p<.001

RESULTS

Respondents' level of trust in their AID system was quantified via classification as either a passive or active reviewers of this AID system, based on the frequency with which they verify the response of their system to a change in their blood glucose ("never" to "sometimes", and "often" to "every time"). Respondent were nearly equally divided into passive (n=755) and active reviewers (n=748).

Close to a third of passive reviewers reported an HbA1c > 7 (32%) – a significantly greater percentage compared to only around 26% of active reviewers (p=0.020).

Additionally, passive reviewers were more likely to view their AID System algorithm as optimal; a third rated their algorithm as "just right", while only 22% of active reviewers rated their same (p<0.001). Active reviewers were significantly more likely to view their algorithm as either too conservative (67% vs 61%, p=0.012) or too aggressive (11% vs 6%, p<0.001), compared to passive reviewers.

Meanwhile, passive reviewers reported greater cognitive benefits associated with the use of their AID system, including fewer diabetes related interruptions to their daily life (38% vs 30%, p<0.05), less effort required for their diabetes management (41% vs 34%, p<0.05), less mental fatigue from managing their diabetes (44% vs 32%, p<0.001), feeling more in control of their diabetes (45% vs 40%, p<0.05) and improved sleep quality (44% vs 39%, p<0.05).

Finally, passive reviewers were significantly more satisfied with their overall diabetes management while using their AID system compared to active reviewers (39% vs 29%, p<0.001).

CONCLUSION

Despite a greater portion of passive reviewers having an HbA1c exceeding 7.0, they reported more optimal algorithm ratings, a greater incidence of cognitive benefits to their diabetes management and greater satisfaction with their management compared to active reviewers. This suggests that those less proactive in their diabetes management perceive greater benefits from their AID system, providing insight into a subset of the patient population who may be most receptive to this technology.

DISCLOSURES

The research in this presentation was carried out and funded by dQ&A Market Research, Inc., which provides research services for a fee to its clients. dQ&A has several clients (>10) in the diabetes field.