

This is a repository copy of *The impact of living with assistance dog placements on quality of life in children and adults with autism spectrum disorder or a physical disability: A longitudinal service evaluation*.

White Rose Research Online URL for this paper:

<https://eprints.whiterose.ac.uk/id/eprint/211240/>

Version: Published Version

---

## Article:

Shoesmith, Emily Kate orcid.org/0000-0002-2420-4919, Gibsone, Selina, Bracher, Ed et al. (5 more authors) (2024) The impact of living with assistance dog placements on quality of life in children and adults with autism spectrum disorder or a physical disability: A longitudinal service evaluation. *Human-Animal Interactions*. ISSN: 2957-9538

<https://doi.org/10.1079/hai.2024.0014>

---

## Reuse

This article is distributed under the terms of the Creative Commons Attribution (CC BY) licence. This licence allows you to distribute, remix, tweak, and build upon the work, even commercially, as long as you credit the authors for the original work. More information and the full terms of the licence here:


<https://creativecommons.org/licenses/>

## Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing [eprints@whiterose.ac.uk](mailto:eprints@whiterose.ac.uk) including the URL of the record and the reason for the withdrawal request.

RESEARCH

# The impact of living with assistance dog placements on quality of life in children and adults with autism spectrum disorder or a physical disability: A longitudinal service evaluation

Emily Shoesmith<sup>1\*</sup>, Selina Gibsone<sup>2</sup>, Ed Bracher<sup>2</sup>, Iris Smolkovič<sup>2</sup>, Kelly Jennings<sup>2</sup>, Laura Viles<sup>2</sup>, Kate Easton<sup>2</sup>, and Elena Ratschen<sup>1</sup>

## Abstract

Assistance dogs are highly trained animals to support individuals with disabilities and medical conditions. Evidence suggests the support provided by an assistance dog can extend beyond physical assistance to therapeutic and communicative domains. However, there is limited research exploring the lived experience of assistance dog placements in the United Kingdom (UK) over an extended period of time. This longitudinal service evaluation was designed to evaluate the placement of assistance dogs, trained by the charity Dogs for Good, with adults and children with autism or a physical disability in the UK. Goals and expectations of being matched with an assistance dog prior to placement, and perceptions of how these dogs have impacted the quality of life of adults and children with autism and/or a physical disability and their families were assessed. Service users who had applied for an assistance dog via the Dogs for Good charity ( $n = 307$ ) were contacted and invited to complete questionnaires at five different time points (pre-dog placement, and 6-, 12-, 24-, and 36-months post dog-placement). Repeated-measures ANOVAs were conducted to determine if there were significant changes to quality of life over time. Mean quality of life scores improved significantly for all service users. Responses to free-text questions were thematically analysed, and three main themes were identified from the free-text responses: goals and expectations for assistance dog pre-placement (e.g., enhancing independence, physical functioning and wellbeing), the positive impact of the assistance dog post-placement (e.g., promoting independence, development of the human-animal bond, improving wider family dynamics, and reducing stigma), and satisfaction with the service. The findings complement and extend previous insights into the impact of assistance dogs on people with autism or a physical disability. They also highlight some challenges associated with the placement of assistance dogs and indicate the need to consider the development of further targeted support strategies.

**Keywords:** assistance dogs, autism, autism spectrum disorder, physical disability, service evaluation

## Introduction

The importance of identifying unmet needs and reducing health inequalities among people with special mental health or physical requirements, such as autism spectrum disorder (ASD) or physical disabilities, feature prominently in the 2019 NHS Long Term Plan (Alderwick and Dixon, 2019) and the recent NHS Core20Plus strategy (NHS, 2021, 2022). Recent national strategies and guidance highlight the need to understand these unmet needs

and support gaps in order to improve services and outcomes for people with ASD (UK Parliament, 2022; NHS England, 2023) and physical disabilities (PDs) (GOV.UK, 2021; National Institute for Health and Care Excellence, 2022). People with ASD or a PD represent a large part of the population internationally (Centers for Disease Control and Prevention, 2023). In the UK, ASD impacts 1–2% of the population (NHS England, 2020), and a PD impacts approximately 8% of children, 18% of working-age adults (16–64),

Affiliations: <sup>1</sup>Department of Health Sciences, University of York, York, Y010 5DD, UK; <sup>2</sup>Dogs for Good, The Frances Hay Centre, Blacklocks Hill, Banbury OX17 2BS, UK

\*Corresponding Author: Emily Shoesmith. Email: [Emily.shoesmith@york.ac.uk](mailto:Emily.shoesmith@york.ac.uk)

Submitted: 22 January 2024. Accepted: 19 March 2024. Published: 04 April 2024

© The Authors 2024. Open Access. This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

and 44% of adults over state pension age (GOV.UK, 2018). Given the increasing prevalence and the impacts on quality of life and independence associated with these conditions, it is important to explore effective and innovative approaches to support these sub-populations (Leung *et al.*, 2022).

Dog-assisted interventions (DAIs) are growing in popularity as a form of complementary or adjunctive therapy to improve mental health outcomes in various clinical populations (Calvo *et al.*, 2016; Wijker *et al.*, 2020; Allen *et al.*, 2022). The mechanisms of action through which DAIs work are not entirely understood but include effects largely purported by the influence of the dog's presence, which can be intrinsically calming or motivating (Fodstad *et al.*, 2019; Crossman *et al.*, 2020). Additionally, there is a large and increasing evidence base supporting the potential benefits of human-animal interaction among individuals with ASD or a PD. For those with ASD, companion animal ownership has been reported to enhance social behaviours (Carlisle, 2015; Harwood *et al.*, 2019) and reduce stress and anxiety (O'Haire *et al.*, 2013; Wright *et al.*, 2015). Likewise, for those with a PD, companion animal ownership has been suggested to protect and/or improve wellbeing (Carr *et al.*, 2018; Janevic *et al.*, 2020), increase physical activity and social interaction (Janevic *et al.*, 2020), and help with symptom management (Wells, 2009; Ryan and Ziebland, 2015). Research suggests these benefits may be derived due to hypothesised mechanisms involving attachment to or companionship provided by the animal (Berry *et al.*, 2012; Brooks *et al.*, 2018; Rodriguez *et al.*, 2020b).

Assistance dogs are trained to support individuals with disabilities and medical conditions (Assistance Dogs UK, 2023). The term 'assistance dog' is not synonymous with 'therapy dog'. Assistance dogs are placed within the home to support one person and the dog is cared for by that individual or their family, whereas therapy dogs are typically involved in AAls and assist multiple people in a therapeutic setting (IAHAIO, 2018; Leung *et al.*, 2022). Research suggests the support provided by an assistance dog extends beyond physical assistance to therapeutic and communicative domains for both population groups (Burrows *et al.*, 2008; Rodriguez *et al.*, 2020b; Leung *et al.*, 2022). For example, the placement of assistance dogs for children with ASD has been shown to decrease anxiety and stress (Burrows *et al.*, 2008; Viau *et al.*, 2010), increase calmness (Burrows *et al.*, 2008), and facilitate social interaction (Davis *et al.*, 2004). Moreover, assistance dogs have been found to contribute to the wider general welfare of families including children diagnosed with ASD (Viau *et al.*, 2010; Berry *et al.*, 2012), and decrease levels of caregiver strain (Burgoyne *et al.*, 2014). Similarly, studies have reported that assistance dogs may contribute to an increased sense of independence for individuals with a PD, as assistance dogs are able to assist with activities of daily living (Winkle *et al.*, 2012). Beyond these practical benefits, people with physical disabilities matched with assistance dogs reported enhanced psychological benefits (Collins *et al.*, 2006; Shintani *et al.*, 2010). As the benefits of an assistance dog are often reported to be underpinned by the dog's companionship, emotional and social support, and social facilitation effects in public (Rodriguez *et al.*, 2020b), it is reasonable to assume assistance dog placement would result in improved quality of life for both sub-groups.

Despite the growing body of evidence reporting the benefits of the human-dog interaction, including those with disabilities, the majority of this research focuses on the impact of companion animal ownership (e.g., untrained dogs) and participation in AAls, and fewer studies explore assistance dog ownership among those with ASD or a PD (Hellings *et al.*, 2022). While there has been research investigating the impact of assistance dogs on various populations, findings are often mixed (Rodriguez *et al.*, 2020a). For example, a cross-sectional survey reported individuals with a mobility assistance dog reported significantly higher quality of life compared to a control group of waitlist-individuals (Hall *et al.*, 2017). Conversely, another cross-sectional study compared individuals

using wheelchairs with an assistance dog to matched controls, and there were no significant group differences on loneliness, depression, self-esteem, positive affect, and community integration (Collins *et al.*, 2006). While there is a growing body of evidence reporting promising findings that assistance dogs may have a positive effect on their owner's mental health and wellbeing, recent systematic reviews conclude the current state of the knowledge is "inconclusive and limited" (Winkle *et al.*, 2012).

Additionally, less is known about the potential translation of these benefits to an assistance dog placed with an individual with ASD or a PD (and their families), on a permanent basis (Leung *et al.*, 2022). Moreover, no published findings have explored the lived experience of assistance dog placement in adults and children with ASD or a PD in the UK, with the majority of recent research being conducted in Australia (Gravrok *et al.*, 2020; Appleby *et al.*, 2022; Hellings *et al.*, 2022; Leung *et al.*, 2022) or the United States of America (USA) (Rodriguez *et al.*, 2020a; Isaacson and Hellman, 2023; Tseng, 2023). Therefore, it is timely to investigate the impact of assistance dog placement in the UK, as existing findings may not be generalisable to the UK population.

As there is an increasing demand for the placement of assistance dogs (Walther *et al.*, 2017), and clearly identified unmet need of people living with ASD or a PD, it is timely and important to expand the evidence base to support the benefits of assistance dog placements for these populations (Leung *et al.*, 2022). Therefore, the aim of this service evaluation was to explore the goals and expectations of being matched with an assistance dog prior to placement, and how these assistance dogs may impact the quality of life of adults with a PD and children with ASD or a PD and their families over an extended period of time.

## Methods

### DOGS FOR GOOD SERVICE AND SERVICE USERS

The service is a UK-based charity named Dogs for Good (previously known as Dogs for the Disabled). The charity provides a range of services including the training and placement of assistance dogs with adults and children. Dogs for Good currently place assistance dogs with: (1) children (7–16 years) with their parent(s), or adults only (16 years+) with a physical disability (e.g., cerebral palsy, spinal injury), or (2) children (3–10 years at point of application) with ASD and their parent(s).

### APPLICATION PROCESS

Applications currently go through a ballot system due to the high demand for assistance dogs. Potential service users are required to complete an initial questionnaire to confirm eligibility and provide details about what assistance they require. Once the ballot closes, applications are drawn out at random until the target has been reached (e.g., number of applications possible to process due to available dogs and staff capacity). Subsequently, applicants attend an information session and if they are happy to proceed, they are required to fill in an application form to provide further details (e.g., information from landlords if pet policies are in place), and a home visit is organised with one of the Dogs for Good instructors. Applicants can be accepted at this point for a placement, or accepted with a proviso (e.g., if their garden needs to be secured to ensure dog welfare, or permission is required from a landlord). Once these steps are completed, applicants are accepted and join the waiting training list. Dogs for Good then hold viewing days, where service users awaiting placements meet the dogs in the system at the 12-week point of their training programme and have the opportunity to see their task work and their free running. Lastly, the Dogs for Good team hold a matching conference to appropriately match the dogs available to those on the waiting training list. The matching process is based on the information collected throughout the aforementioned process to ensure an appropriate match is made for both the service user and the assistance dog. While there is no charge to be placed with an

assistance dog, service users are asked to pay for ongoing costs (e.g., dog food and insurance), but financial assistance is available for those who require it.

## TRAINING

Dogs for Good acquire their puppies through a breeding scheme, where they are cared for by volunteer puppy socialisers. The Dogs for Good staff members provide support and guidance to the volunteers and regularly assess the puppies as they develop, scoring various domains (e.g., social skills, practical skills). At the 6-week training mark, it is decided whether dogs will be trained for service users with ASD or a PD. For example, the 6-week walk for a service user with ASD involves the dog walking in a team formation in an autism jacket, whereas the 6-week walk for a service user with a PD involves walking next to a mobility aid. Dogs are trained to carry out specific skills, dependent on whether they will be placed with a service user with ASD or a PD. For example, dogs who will be placed with a service user with a PD will focus primarily on pushing, pulling and retrieving, whereas dogs who will be placed with a service user with ASD will focus on team formation, curb work and obstacle avoidance. All dogs are trained to headrest and nose nudge for emotional benefits (e.g., to rest their head on their owner's lap to reduce stress). Further training is provided based on specific individual needs, for example, if an assistance dog needed to be on the right hand side of a service user due to the mobility aid control. In 2023, 33 dogs were placed with service users with a 90% success rate ( $n = 30$ ). Two were returned due to deterioration to service user's health, and only one was returned due to a mismatch.

Dogs for Good provide continuous provision of advice and support to the service user pre- and post-placement, which is tailored to individual need. The charity also provides training and education to assist with the development of the human-dog bond, to help the service users understand and meet the welfare and wellbeing needs of the dog and highlight that the dog is an equal partner.

## DATA COLLECTION AND MEASURES

Dogs for Good staff members contacted and invited service users to complete questionnaires at five different time points (pre-dog placement, and 6-, 12-, 24-, and 36-months post dog-placement). Those who agreed were able to complete the questionnaires via their preferred method (postal copy or email) from 2017 to 2019, before the questionnaires moved to online forms in 2020.

## ETHICAL CONSIDERATIONS

The longitudinal service evaluation commenced in July 2017 and is ongoing, but the current service evaluation reports on data up until September 2023. The project was reviewed and approved as a service-related project by Dogs for Good. This was considered a service evaluation of existing data and there was no change to standard practice. All service users were provided with information sheets that explained the aims of the questionnaire and voluntary completion indicated consent. The evaluation followed local approval procedures, with permission gained from the Dogs for Good Research and Development Team.

## MEASURES

Bespoke questionnaires were developed by the Dogs for Good team, as detailed below. For assistance dogs placed with children with their parent(s), two questionnaires were available for completion by the child service user or their parent. The child's version of the questionnaire could be completed by the child or by their parent on the child's behalf.

**Demographic data:** Demographic information was gathered about service users' age (in bands, including 3–7, 18–24, 25–34, 35–44, 45–54, 55–64 and 65 years and above), and their gender (male/female).

**Goals and expectations:** The pre-dog placement questionnaire included two free-text questions asking service users to indicate their goals and expectations: 'please tell us more about how you think an assistance dog may impact your quality of life', and 'what do you hope to achieve through having an assistance dog?'. The post-dog placement questionnaires included a question asking service users to indicate on a scale of 1–7 (1 = not achieved; 7 = fully achieved) how well they had achieved their initial goals stated in the pre-dog placement questionnaire.

**Quality of life:** Questions to assess quality of life were adapted from the Quality of Life Scale (QOLs) (Flanagan, 1982; Burckhardt and Anderson, 2003). Service users were asked to indicate how satisfied they were with 16 items reflecting five domains of quality of life (material and physical wellbeing; relationships with other people; social; community and civic activities; personal development and fulfilment, recreation, and independence) on a 7-point Likert scale (1 = terrible; 7 = delighted). For adults and parent service users, the 16 items maintained the same content as the original QOLs but were slightly rephrased from the original items for ease of completion by providing examples. For example, 'how satisfied are you with participating in active recreation?' was rephrased to 'how satisfied are you with actively participating in recreational activities, such as participating in music, arts, sporting, activities, video games?'.

The child's version of the questionnaire asked service users to select the option which best described how satisfied the child is (or how their parent perceives them to be) on 11 items reflecting the same five domains of quality of life. Items were removed to ensure appropriateness for children (e.g., those relating to material comforts and financial security, relationships with spouse or significant other, having and rearing children). Items were rephrased for ease of completion, for example, 'how satisfied are you with close friends?' was rephrased to 'how do you feel about your friendships with people?'. These were rated on a 7-point Likert scale using rephrased Likert scale responses (1 = really sad; 7 = really happy), and emoticons were also included alongside the Likert scale responses to assist with completion.

For all versions, total scores were calculated from individual items, with higher scores on these scales representing better quality of life. A free-text question was also included for adult and parent service users: 'Please tell us more about how your quality of life has been affected since having your assistance dog'.

**Satisfaction with service:** Adult or parent service users were asked to indicate on a scale of 1–7 (1 = not at all satisfied; 7 = completely satisfied), how satisfied they were with the overall quality of the service Dogs for Good had provided. A free-text box was also available for service users to indicate any further comments related to the service provided. This question was included in both the pre-dog and post-dog placement questionnaires.

## DATA ANALYSIS

Descriptive summary statistics are presented for demographic variables and data relating to perceptions of whether initial goals had been achieved, quality of life, and satisfaction with the service provided. Repeated-measures ANOVAs were conducted to determine if there were significant changes to goal achievement, quality of life, and satisfaction with the service over time. Data were analysed using IBM SPSS Version 29 (IBM Corp, 2020). Responses to free-text questions were exported to NVivo 12 software (QSR International Pty Ltd. Version 12, Ottawa, ON, Canada). The free-text comments were analysed using thematic analysis (Clarke *et al.*, 2015), employing an inductive approach, in which coding and theme development were driven by the content of the responses. One author familiarised herself with the data by reading all responses, and notes were made of any potential codes by identifying recurring words or units of meaning. Subsequently, the same author generated initial codes from the data and organised

them into meaningful groups. Codes were then organised into potential themes and all relevant coded responses were collated within the identified themes. Two authors independently reviewed the construction of themes and relevant quotations to agree to the assignment of themes.

## Results

At the current point of data collection, all service users who had applied for an assistance dog ( $n = 307$ ) were invited to complete a pre-dog placement questionnaire. Of these, 192 completed the questionnaire (adults,  $n = 105$ ; child/parent,  $n = 87$ ) with a return rate of 62.5%. Those who chose not to complete the questionnaires were still placed with an assistance dog. The number of service users invited, completed questionnaires, and return rates (%) for each questionnaire timepoint post-dog placement are presented in Table 1. Due to the longitudinal nature of this service evaluation, service users applied for an assistance dog at varying times between July 2017 to the current date. Therefore, the number of service users invited to complete questionnaires at post-dog placement timepoints reflect those who had been placed with a dog for that length of time.

Demographics for the 192 service users completing the pre-dog placement questionnaire are presented in Table 2. Service user

demographics for the post-dog placement questionnaires are presented in Supplementary Material 1.

## QUANTITATIVE QUESTIONNAIRE DATA

### Goal achievement scores

The mean goal achievement scores over time for service users who completed the 6-months post-placement questionnaire to 12-, 24-, and 36-months post-placement are presented in Table 3. The mean scores continued to increase over time for those who completed all questionnaires from 6-months post-placement to 12-, 24-, and 36-months post-dog placement (see Table 3), however, this change was not significant for all service users who had completed questionnaires from 6-months post-placement to: 12-months post-placement ( $p = 0.50$ ); 24-months post-placement ( $p = 0.51$ ), or 36-months post-placement ( $p = 0.12$ ).

### Quality of life scores

The mean total quality of life scores over time for service users who completed the pre-dog placement questionnaire to 6-months post-placement; 12-months post-placement; 24-months post-placement and 36-months post-placement are presented in Table 4.

**Table 1.** Return rate of completed questionnaires at each timepoint for all service users, and separated by adults and children/parent(s).

	Service users invited (n)	Completed questionnaires (n)	Return rate (%)
All service users			
Pre-dog	307	192	62.5
6-months	116	71	61.2
12-months	106	63	59.4
24-months	71	43	60.6
36-months	35	24	68.6
Adults with a physical disability			
Pre-dog	173	105	60.7
6-months	68	44	65.2
12-months	58	37	63.8
24-months	33	21	63.6
36-months	15	10	66.6
Children with ASD or a physical disability			
Pre-dog	134	87 <sup>1</sup>	65.2
6-months	48	27 <sup>2</sup>	57.1
12-months	48	26 <sup>3</sup>	54.2
24-months	38	22 <sup>4</sup>	58.3
36-months	20	14 <sup>5</sup>	70.0

<sup>1</sup>Answered by child or by parent on child's behalf ( $n = 57$ ); answered by parent ( $n = 30$ ).

<sup>2</sup>Answered by child or by parent on child's behalf ( $n = 17$ ); answered by parent ( $n = 10$ ).

<sup>3</sup>Answered by child or by parent on child's behalf ( $n = 13$ ); answered by parent ( $n = 13$ ).

<sup>4</sup>Answered by child or by parent on child's behalf ( $n = 8$ ); answered by parent ( $n = 14$ ).

<sup>5</sup>Answered by child or by parent on child's behalf ( $n = 7$ ); answered by parent ( $n = 7$ ).

**Table 2.** Demographics for service users completing the pre-dog placement questionnaire.

		(%) N	Missing data (%) N
Adults with a physical disability ( $n = 105$ )			
Age	13–17	1.0 (1)	0 (0)
	18–24	20.0 (21)	
	25–34	14.3 (15)	
	35–44	11.4 (12)	
	45–54	13.3 (14)	
	55–64	25.7 (27)	
	65+	14.3 (15)	
Gender	Male	19.0 (20)	0 (0)
	Female	81.0 (85)	
Diagnosis	Physical disability	100 (105)	0 (0)
Children with ASD or a physical disability (or their parents) ( $n = 87$ )			
Age	3–6	13.8 (12)	2.3 (2)
	7–12	39.1 (34)	
	13–17	12.6 (11)	
	18–24	3.5 (3)	
	25–34	6.9 (6)	
	35–44	11.5 (10)	
	45–54	5.7 (5)	
	55–64	2.3 (2)	
	65+	2.3 (2)	
Gender	Male	54.0 (47)	0 (0)
	Female	46.0 (40)	
Diagnosis	Physical disability	52.9 (46)	0 (0)
	Autism spectrum disorder	47.1 (41)	



**Table 3.** Mean goal achievement scores over time for service users who completed the 6-months post-placement questionnaire to 12-months post-placement; 24-months post-placement, and 36-months post-placement.

All service users				
	6-months	12-months	24-months	36-months
6-months to 12-months (n = 42)	6.05	6.41		
6-months to 24-months (n = 20)	6.26	6.31	6.42	
6-months to 36-months (n = 10)	6.38	6.63	6.75	6.78
Adults with a physical disability				
	6-months	12-months	24-months	36-months
Pre-dog to 6-months (n = 28)	6.12	6.50		
Pre-dog to 12-months (n = 14)	6.46	6.62	6.64	
Pre-dog to 24-months (n = 8)	6.29	6.57	6.71	6.77
Children with a physical disability				
	6-months	12-months	24-months	36-months
Pre-dog to 6-months (n = 7)	6.00	6.83		
Pre-dog to 12-months (n = 4)	5.75	5.95	6.00	
Pre-dog to 24-months (n = 1)	7.00	7.00	7.00	7.00
Children with ASD				
	6-months	12-months	24-months	36-months
Pre-dog to 6-months (n = 7)	5.80	6.60		
Pre-dog to 12-months (n = 2)	6.00	6.50	6.50	
Pre-dog to 24-months (n = 1)	7.00	7.00	7.00	7.00

Quality of life scores improved significantly over time for all service users (adults and children) who had completed all questionnaires from pre-dog placement to: 6-months post-placement (n = 64),  $F(1.0, 63.0) = 32.61$ ,  $p = 0.001$ ; 12-months post-placement (n = 42),  $F(1.39, 56.88) = 22.46$ ,  $p = 0.01$ ; 24-months post-placement (n = 20),  $F(1.57, 29.77) = 6.32$ ,  $p = 0.01$ , and 36-months post-placement (n = 10),  $F(1.89, 16.99) = 3.66$ ,  $p = 0.05$  (see Fig. 1).

Likewise, quality of life scores improved significantly over time for all adults with a PD who had completed all questionnaires from pre-dog placement to: 6-months post-placement (n = 42),  $F(1.0, 41.0) = 37.77$ ,  $p = 0.001$ ; 12-months post-placement (n = 28),  $F(1.43, 38.64) = 23.55$ ,  $p = 0.001$ ; 24-months post-placement (n = 14),  $F(1.87, 23.88) = 7.41$ ,  $p = 0.004$ , and 36-months post-placement (n = 8),  $F(2.78, 19.47) = 8.71$ ,  $p = 0.001$ .

However, quality of life scores did not significantly improve over time for all children with a PD or ASD who had completed all questionnaires from pre-dog placement to: 6-months post-placement (n = 22),  $F(1.0, 21.0) = 3.63$ ,  $p = 0.07$ ; 12-months post-placement (n = 14),  $F(1.30, 16.91) = 3.33$ ,  $p = 0.06$ ; 24-months

post-placement (n = 6),  $F(1.0, 19.0) = 0.89$ ,  $p = 0.403$ , and 36-months post-placement (n = 2),  $F(1.0, 1.0) = 0.312$ ,  $p = 0.676$ .

When children with a PD or ASD were analysed separately, quality of life scores did not significantly improve over time for children with ASD who had completed all questionnaires from pre-dog placement to 6-months post-placement (n = 8),  $F(1.0, 7.0) = 0.89$ ,  $p = 0.38$ ; 12-months post-placement (n = 7),  $F(1.47, 8.80) = 0.252$ ,  $p = 0.78$ , and 24-months post-placement (n = 2),  $F(1.0, 1.0) = 0.46$ ,  $p = 0.62$ . Likewise, quality of life scores did not significantly improve over time for children with a PD who had completed all questionnaires from pre-dog placement to 6-months post-placement (n = 14),  $F(1.0, 13.0) = 2.66$ ,  $p = 0.13$  and 24-months post-placement (n = 4),  $F(1.2, 3.6) = 1.17$ ,  $p = 0.37$ . However, quality of life scores did significantly improve for children with a PD who had completed all questionnaires from pre-dog placement to 12-months post-placement (n = 7),  $F(1.3, 7.5) = 4.45$ ,  $p = 0.04$ .

## OVERALL SATISFACTION WITH SERVICE

The mean satisfaction scores over time for service users who completed the pre-dog placement questionnaire to 6-months post-placement; 12-months post-placement; 24-months post-placement, and 36-months post-placement are presented in Table 5. Mean scores remained consistent across timepoints, and did not change significantly over time for all service users who had completed all questionnaires from pre-dog placement to 6-months post-placement ( $p = 0.65$ ); 12-months post-placement ( $p = 0.66$ ); 24-months post-placement ( $p = 0.77$ ), or 36-months post-placement ( $p = 0.49$ ).

## QUALITATIVE FREE-TEXT RESPONSES

Eighty-six service users provided at least one response to free-text items across the five timepoints, resulting in 230 free-text responses overall (adults, n = 143; parent, n = 87). The thematic analysis of free-text responses, many of which included substantial detail, resulted in the identification of three main themes with associated sub-themes related to various aspects of being placed with an assistance dog (see Table 6). To illustrate themes and sub-themes, the free-text responses are presented as verbatim quotes below, and the timepoint and whether the service user was adult with PD or a parent of a child with ASD or a PD is provided in brackets.

## GOALS AND EXPECTATIONS FOR ASSISTANCE DOG PRE-PLACEMENT

### *Facilitating day-to-day tasks and enhancing independence*

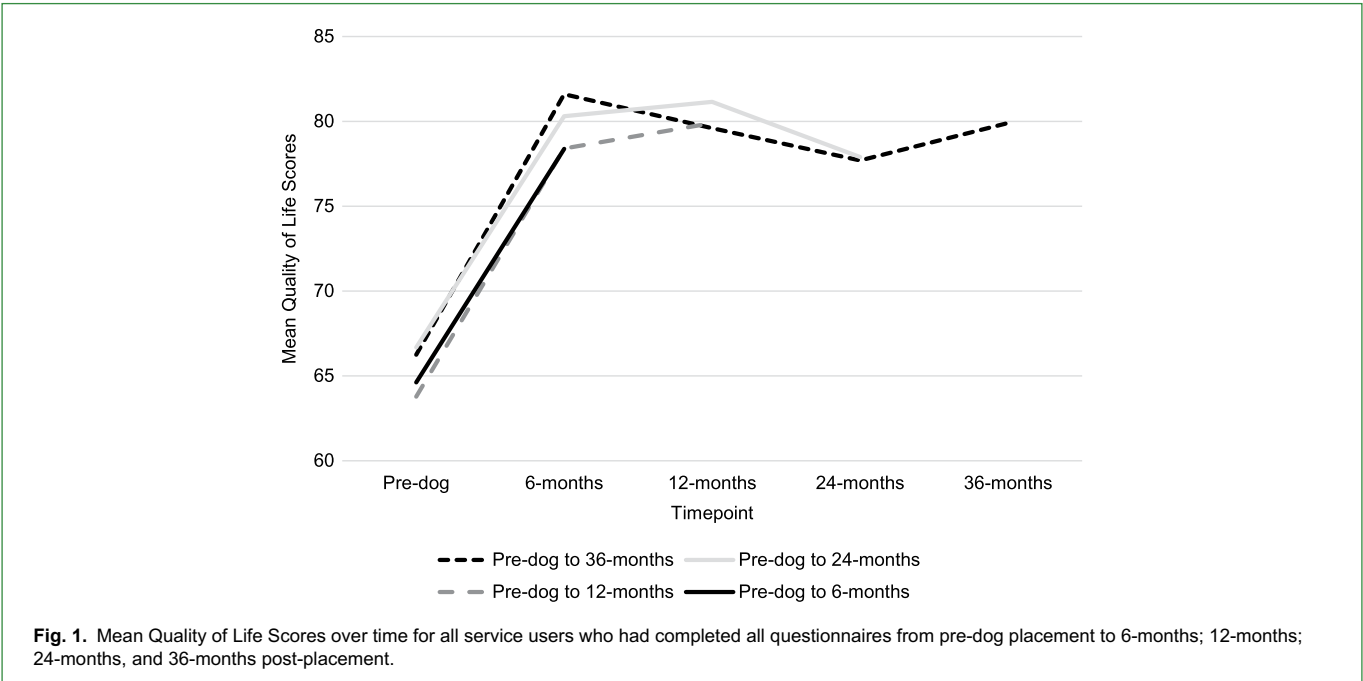
Prior to placement, service users were asked about their goals and expectations of an assistance dog. The most commonly expressed response was in relation to facilitating daily activities and increasing independence and a sense of purpose for all service users. Many adult service users expressed their need for assistance which would subsequently enhance their self-confidence and reduce their dependence on others. Parent service users frequently reported they hoped for a source of companionship for their child that would provide motivation, independence, and offer a sense of security and safety.

*"We would really like to develop a number of skills for [son with ASD] with the assistance of his dog. Smaller steps: for him to be able to walk down the street calmly and confidently, without stopping and panicking/becoming overwhelmed. Larger steps include for him to be able to visit a new and unfamiliar place and access facilities/attractions, have new experiences such as travelling on a train" (Parent of child with ASD, pre-dog placement).*

*"Improve inner strength that comes with getting out at regular times, having a routine and a purpose in getting out of the house. To keep and maintain my independence by being able to work with my dog and not have to rely on other people" (Adult with PD, pre-dog placement).*

**Table 4.** Mean total quality of life scores over time for service users who completed the pre-dog placement questionnaire to 6-months post-placement; 12-months post-placement; 24-months post-placement, and 36-months post-placement.

All service users					
	Pre-dog	6-months	12-months	24-months	36-months
Pre-dog to 6-months (n = 64)	64.62	78.38			
Pre-dog to 12-months (n = 42)	63.77	78.40	79.90		
Pre-dog to 24-months (n = 20)	66.68	80.30	81.15	77.90	
Pre-dog to 36-months (n = 10)	66.25	81.60	79.60	77.70	79.90
Adults with a physical disability					
	Pre-dog	6-months	12-months	24-months	36-months
Pre-dog to 6-months (n = 42)	65.73	81.86			
Pre-dog to 12-months (n = 28)	65.55	80.86	84.04		
Pre-dog to 24-months (n = 14)	69.18	84.00	83.07	81.64	
Pre-dog to 36-months (n = 8)	64.56	86.50	82.63	81.75	84.25
Children with a physical disability					
	Pre-dog	6-months	12-months	24-months	36-months
Pre-dog to 6-months (n = 14)	64.14	75.36			
Pre-dog to 12-months (n = 7)	59.14	83.00	82.43		
Pre-dog to 24-months (n = 4)	61.50	82.25	85.25	77.75	
Pre-dog to 36-months (n = 1)	69.00	70.00	74.00	74.00	66.00
Children with ASD					
	Pre-dog	6-months	12-months	24-months	36-months
Pre-dog to 6-months (n = 8)	59.63	65.38			
Pre-dog to 12-months (n = 7)	61.29	64.00	60.86		
Pre-dog to 24-months (n = 2)	59.50	50.50	59.50	52.00	
Pre-dog to 36-months (n = 1)	47.00	54.00	61.00	49.00	59.00



**Fig. 1.** Mean Quality of Life Scores over time for all service users who had completed all questionnaires from pre-dog placement to 6-months; 12-months; 24-months, and 36-months post-placement.

**Table 5.** Mean satisfaction scores over time for service users who completed the pre-dog placement questionnaire to 6-months post-placement; 12-months post-placement; 24-months post-placement, and 36-months post-placement.

All service users					
	Pre-dog	6-months	12-months	24-months	36-months
Pre-dog to 6-months (n = 64)	6.86	6.89			
Pre-dog to 12-months (n = 42)	6.84	6.81	6.81		
Pre-dog to 24-months (n = 20)	6.89	6.89	6.39	6.39	
Pre-dog to 36-months (n = 10)	6.86	6.86	6.72	6.72	6.72
Adults with a physical disability					
	Pre-dog	6-months	12-months	24-months	36-months
Pre-dog to 6-months (n = 42)	6.83	7.00			
Pre-dog to 12-months (n = 28)	7.00	6.77	6.77		
Pre-dog to 24-months (n = 14)	6.83	6.92	6.92	6.92	
Pre-dog to 36-months (n = 8)	6.83	6.83	7.00	6.50	
Children with a physical disability					
	Pre-dog	6-months	12-months	24-months	36-months
Pre-dog to 6-months (n = 14)	7.00	7.00			
Pre-dog to 12-months (n = 7)	7.00	7.00	6.83		
Pre-dog to 24-months (n = 4)	7.00	7.00	6.75	7.00	
Pre-dog to 36-months (n = 1)	7.00	7.00	7.00	7.00	7.00
Children with ASD					
	Pre-dog	6-months	12-months	24-months	36-months
Pre-dog to 6-months (n = 8)	7.00	7.00			
Pre-dog to 12-months (n = 7)	7.00	7.00	7.00		
Pre-dog to 24-months (n = 2)	7.00	7.00	7.00	7.00	
Pre-dog to 36-months (n = 1)	7.00	7.00	7.00	7.00	7.00

**Table 6.** Themes and associated sub-themes.

Theme	Sub-theme
Goals and expectations for assistance dog pre-placement	Facilitating day-to-day tasks and enhancing independence Enhancing physical functioning and activity levels Improving psychological wellbeing and mental health Fostering a positive family environment
The positive impact of an assistance dog post-placement	Promoting independence and confidence with day-to-day activities Enhancing psychological wellbeing and mental health Positive impact of the human-animal bond Improving wider family dynamics Increasing awareness and reducing stigma
Satisfaction with service	Overall feedback about the service Challenges associated with the service



### Enhancing physical functioning and activity levels

Many service users hoped an assistance dog would facilitate physical functioning and activity levels. There was consensus that an assistance dog would motivate them to exercise and spend more time outdoors, which would subsequently positively impact their psychological wellbeing. Some parent service users also expressed that encouraging more exercise for their child via dog walking may offer other opportunities for socialisation.

*"As his arthritis gets worse, hoping that taking [dog's name] for walks will encourage [son with PD] to exercise more regularly and socialise with other people and dogs on daily walks"* (Parent of child with PD, pre-dog placement).

*"I am motivated to go out more and interact in my local community and enjoy the fresh air and exercise with my dog which helps improve my appetite and sleep patterns and overall mood"* (Adult with PD, pre-dog placement).

### Improving psychological wellbeing and mental health

Both adult and parent service users believed an assistance dog may help to ameliorate their or their child's wellbeing and mental health by providing a reliable source of support and companionship.

*"An assistance dog will give me independence, confidence, and companionship, all of which now I have lost. After having two dogs already, the difference they made to my life was wonderful, but now I feel lost, lonely, and anxious. An assistance dog will have a calming effect to help/reassure me and reduce impact of stressful situations and anxiety"* (Adult with PD, pre-dog placement).

*"I feel it will ease her anxiety and enable her to feel some joy in life. I'm hoping that a reduction in her anxiety will enable her to cope with the smallest of unavoidable daily demands that she is currently unable to do"* (Parent of child with ASD, pre-dog placement).

Additionally, parent service users frequently expressed it would be beneficial if the presence of an assistance dog would be able to increase calmness and decrease stress-related behaviours for their child with ASD.

*"For [son with ASD] to reduce his meltdowns, specifically in relation to his head banging behaviours, and to be able to transition out of a meltdown more quickly"* (Parent of child with ASD, pre-dog placement).

*"Assistance with struggles that [son with ASD] faces every day, thus having an impact on all of our emotions and wellbeing. For example, reducing meltdowns, helping with transitions, walking down the street, etc., a positive focus for us all"* (Parent of child with ASD, pre-dog placement).

### Fostering a positive family environment

For parent service users, there was consensus that the placement of an assistance dog may offer more opportunities for the family to go out together and increase a sense of calmness in the household. Many parents indicated accessing the community could be stressful as they were concerned about their child's safety and wellbeing when in public places.

*"To access the local community without my daughter [with ASD] feeling stressed and anxious. Calmer morning and evening routines, a more relaxed family life"* (Parent of child with ASD, pre-dog placement).

*"Freedom to go out without extensive planning regarding [daughter with ASD] worries – the dog will help her to feel safer and this will make us closer as a family. To give my daughter a bond with an animal that calms her. We would be able to visit more places and get more exercise as a family. We would bond more as a family"* (Parent of child with ASD, pre-dog placement).

## THE POSITIVE IMPACT OF AN ASSISTANCE DOG POST-PLACEMENT

### Promoting independence and confidence with day-to-day activities

It was clear that the placement of an assistance dog gave service users a sense of purpose and focus, facilitating day-to-day activities

and promoting independence. Adult service users frequently expressed how this had positively impacted their self-esteem and provided them with the confidence to carry out activities of daily living and access the community without relying on relatives or friends. For example, *"Life has changed a lot since having [dog's name]. Before, I hardly went out and now I'm off out to parks, shops, cafes, every day. She gives me more independence so I don't have to rely on my daughter or carers for some things like picking items up which I could be in trouble without especially when I'm on my own as [dog's name] can fetch my phone, fetch the post, pick up a long grabber, help fetch washing, open doors and so much more. [Dog's name] has made life so much more fun"* (Adult with PD, 24-months post-placement).

Likewise, parent service users discussed how the assistance dog had enhanced their child's independence and provided a source of motivation to engage them in activities. Reassurance and stability for the children in stressful situations was another benefit, and children would often seek out their assistance dog when feeling overwhelmed.

*"His independence has skyrocketed; he is able to spend more time playing around the house without me and is now independently getting his shoes on and packing a day bag for his activities. We are accessing the community more frequently, motivation levels have definitely increased due to the partnership"* (Parent of child with PD, 12-months post-placement).

*"In the last year, [son with ASD] has gone to a restaurant twice (different ones), the cinema twice, Blenheim Palace, into hospital to see me, shops so many times I've lost count. Book shop and garden centre. With [dog's name] by his side, it grounds him, he feels safe"* (Parent of child with ASD, 12-months post-placement).

This also extended beyond adult and child service users, and positively impacted the lives of parents of children with ASD or a PD. Parents expressed their assistance dog had facilitated daily activities that were otherwise challenging, allowed them to access the community with their family more frequently and offered them the opportunity to have more time for themselves as their child felt calmer and safer in the presence of, or attached to, the assistance dog. For example, *"I get time out in the fresh air every day. The independence the dog has given to our son [with ASD] has freed up my time and my head space as well. We can spend more time together as a family and visit more places without having to super plan and prepare. The frustration levels have diminished and there's more laughter and fun. Having [dog's name] means going out with [child's name] is less stressful, which means in turn my stress levels have come down"* (Parent of child with ASD, 12-months post-placement).

### Enhancing psychological wellbeing and mental health

Assistance dogs were frequently perceived as being able to enhance mood and reduce stress. Service users frequently described positive experiences of how their assistance dog had influenced their current circumstances and associated mood states. For example, many adult service users referred to depression and/or anxiety, and how their assistance dog had provided a source of companionship and emotional support. Likewise, parent service users expressed their children had displayed increased calmness and decreases in stress-related behaviours.

*"His help to my emotional wellbeing has made the most difference to me, he gives me confidence to go out more and if I get worried or anxious, he rests his head on my knee. After unexpectedly losing my last assistance dog during a difficult time with the pandemic, I had become very depressed, but I now have a reason to get up every day and have another wonderful companion. Life is better with him by my side"* (Adult with PD, 6-months post-placement).

*"He's becoming a lifeline to [son's name]. He's definitely helping [son with ASD] to keep calm, keeping him safe whilst walking about, encouraging him to be a part of the world"* (Parent of child with ASD, 6-months post-placement).

### Positive impact of the human-animal bond

There was consensus for all service users that their assistance dogs constituted a reliable source of support, providing unconditional love and companionship that fostered relationships that were free from judgement and conflict. Service users frequently referred to the value of the strong human-animal bond that had developed.

*"[Dog's name] has helped my son enormously, particularly emotionally in the 6 months we have had her, they have developed such a strong bond"* (Parent of child with PD, 6-months post-placement).

*"The partnership/friendship has been life changing. I cannot stress enough how amazing, helpful, and supportive in many more ways than I expected"* (Adult with PD, 12-months post-placement).

One parent of a child with a PD spoke about the love and companionship their assistance dog had provided, highlighting how the strength of the human-animal bond had been 'life changing'. The parent service user shared a poem that their child wrote about their assistance dog: *"This is the face, that rests in my lap, needs a snack, is part of the pack. This is the face, that sniffs the air, stalks the cat, nudges the chair, and lies on the mat. This is the face, with a worried expression, that prods your arm, licks your palm. This is the face, that is full of concentration, love, determination"* (Parent of child with PD, 24 months).

### Improving wider family dynamics

In addition to the direct benefits to the service user, there was consensus that the placement of the assistance dog had fostered a more positive family dynamic for those with children with ASD or a PD. Parents frequently expressed how their assistance dog had improved the quality of life of the whole family, increased a sense of calmness and feelings of joy in the household, and enhanced the relationship between family members.

*"We have spent more time as a family, due to walks we have taken together. We have spent a lot more time outdoors, which again has been fantastic. We also spend a lot of time laughing together at [dog's name] antics, which has its own benefits. This has been a fantastic experience, and we all feel that [dog's name] fits into the family really well and brought huge benefits to both [son's name] and the whole family"* (Parent of child with PD, 6-months post-placement).

*"Unquantifiable joy on a daily basis from [dog's name] loving personality! He is a treasured member of our family. Everyone's more active and relaxed around him"* (Parent of child with ASD, 36-months post-placement).

### Increasing awareness and reducing stigma

Some adult service users expressed how public perception had become more positive, and their assistance dog had helped to reduce the stigma associated with their diagnosis.

*"When you're in a wheelchair, people often ignore you, but [dog's name] makes them feel more comfortable about talking to me now. I've regained my love of outdoors as I have someone who is happy to walk with me even if it's the same old routes"* (Adult with PD, 12-months post-placement).

*"For people in a wheelchair it can be a very lonely life, people don't talk to you but as soon as you have a dog, the chair becomes invisible, and everyone wants to say hello. This is something I was not expecting but just goes to show how amazing these dogs are"* (Adult with PD, 24-months post-placement).

It appeared that the assistance dog sometimes provided a visual cue to help the community understand the service user had a disability, and this perceived increase in awareness and understanding increased the service user's comfort in accessing the community more frequently.

*"Life in the special education needs world can be a lonely existence. Having an assistance dog has opened up new doors for us, it's raising awareness, and has improved family life for all of us"* (Parent of child with ASD, 12-months post-placement).

*"There is no hesitation, the uplifting atmosphere that has been created that I'm not feeling so isolated or guilty that I need so much help. The kids are more light-hearted rather than worrying if mummy can manage and my husband is more reassured of my safety when I am out and about in public as I have much more confidence"* (Adult with PD, 12-months post-placement).

## SATISFACTION WITH THE SERVICE

### Overall feedback about the service

All service users who provided a free-text comment about their perceived satisfaction offered positive feedback about the overall service, highlighting the value of the charity, and expressing how their assistance dog had improved their quality of life: *"Thank you to all at Dogs for Good, we will be forever grateful to you for enhancing all of our lives. I am so glad when I first saw the charity, it ignited a want and determination and a clear understanding that sometimes there are other means to be able to live a fulfilled, happy life – we are honoured to be a part of the Dogs for Good family! The charity is life changing"* (Parent of child with ASD, 6-month post-placement).

Service users frequently referred to their satisfaction with the Dogs for Good staff members and dog training provided. Both adult and parent service users expressed their gratitude for the comprehensive support, training, and visits offered from pre-dog placement to post-dog placement: *"[Staff member's name] was a fantastic trainer and supported me so much, especially in the early days when I was finding adjusting to having [dog's name] a bit difficult at times as she was unsettled for a few weeks. [Staff member's name] was always very supportive and her knowledge and understanding of the training process helped me very much. My confidence has really grown, she is always so encouraging, tries different ways of approaching things"* (Adult with PD, 6-months post-placement).

Additionally, the matching process of the service user and their assistance dog appeared to be an important factor in perceived satisfaction levels. The successful matching process ensured the service users and their respective dogs worked optimally together and appeared to facilitate a strong human-animal bond. For example, *"I wouldn't want to change her. We are very well matched. It could not have been better"* (Adult with PD, 6-month post-placement) and *"[Dog's name] has such a similar character to [son's name], they perfectly match each other, which goes to show your matching process works"* (Parent of child with ASD, 36-months post-placement).

Lastly, service users also expressed positive feedback in relation to how the charity monitored dog's welfare, an important ethical issue that must be considered both pre- and post-placement: *"I feel that Dogs for Good pay good attention to the dog's welfare. I love the training methods and ethical approach to all the dogs in training – 10/10"* (Adult with PD, 6-month post-placement).

### Challenges associated with the service

Despite the positive feedback about the service, some service users highlighted challenges they had experienced throughout the process. For example, while the matching process was perceived as successful, this was a rigorous and time-consuming process. Therefore, there could be a delay when finding a suitable placement or successor dog (a new placement due to loss or retirement of the first assistance dog), however, service users did understand the need for the time taken and indicated the rigorous matching process was a worthwhile wait.

*"The hardest part of the application process is waiting to hear if I had been matched to a dog – it would help to hear more during this period to know that the matching process is going on behind the scenes. Having been matched with a brilliant dog, I can see the effort you and the team go to"* (Adult with PD, pre-dog placement).

*"Even though it was nearly a year before a successor dog was matched with me, [staff member's name] kept in constant touch to assure me that I hadn't been forgotten and that she was always watching out at every meeting for a dog who might be perfect for me"* (Adult with PD, 12-months post-placement).

Service users who had been previously paired with an assistance dog and were awaiting placement of a successor dog often expressed how this negatively impacted their wellbeing. The responses highlighted feelings of grief not only to the loss of a beloved companion but one who also fulfilled fundamental needs for caregiving. For example, *'My quality of life has improved dramatically. It slumped drastically during lockdown, especially as my first dog passed away and I also had to "shield" at the same time. I had to wait just over a year for my successor dog, and that was a very hard time for me. I know I had to wait until a suitable match was found, but it wasn't easy, and I really struggled during that time'* (Adult with PD, 24-months post-placement).

Lastly, some service users also expressed challenges associated with dog training, especially when the placement was new and service users had difficulties adjusting to the new partnership or training the dog for specific medical needs. However, these were often resolved effectively with support from the Dog for Good staff team. For example, *"She has lots of personality but needed a lot of calming as she jumped a lot at the start and was over enthusiastic when doing things which was difficult for someone with low muscle tone. She was also quite boisterous (in a friendly way) around other people. This situation has been rectified and so we have been pleased that we have been listened to and are in a much better place with it all"* (Parent of child with PD, 6-months post-placement).

## Discussion

This longitudinal service evaluation aimed to explore the goals and expectations of being matched with an assistance dog prior to placement, and how these assistance dogs may impact the quality of life of adults with a PD and children with ASD or a PD on a permanent basis. The findings from this service evaluation demonstrate that, in the populations evaluated, the impact of assistance dogs on the lives of the humans they are placed with go above and beyond that of physical assistance. While quality of life scores did not significantly improve over time for children with ASD or a PD, qualitative data indicated that assistance dog placement did constitute an important source of emotional support to the children. Despite these benefits, there are often challenges associated with the placement of an assistance dog that should be considered in future research.

### THE RELATIONSHIP BETWEEN ASSISTANCE DOGS AND QUALITY OF LIFE

The most commonly cited expectation prior to placement related to the assistance dog's ability to promote independence and confidence with daily functioning. It was frequently expressed at various post-placement time points that these goals had been met. Existing evidence has described assistance dogs as a unique assistive aid to enhance functional ability among those with a PD (Winkle *et al.*, 2012; Vincent *et al.*, 2019), and those with ASD (Dollion *et al.*, 2022; Leung *et al.*, 2022). Subsequently, these improvements are likely to result in enhanced wellbeing and overall quality of life. This was clear from the current findings, as many service users frequently expressed how their assistance dog had enhanced their psychological wellbeing. These benefits may have been derived due to mechanisms involving attachment to or

companionship provided by the animal, as the majority of service users expressed their dog provided a reliable source of emotional support and unconditional love. The high prevalence of responses reporting emotional benefits aligns with previous research reporting the addition of an assistance dog can increase feelings of self-worth and safety while contributing to higher positive affect (Winkle *et al.*, 2012). In particular, assistance dogs have been reported to decrease anxiety and stress and increase calmness and wellbeing for children with ASD (Burrows *et al.*, 2008; Viau *et al.*, 2010) and individuals with a PD (Rintala *et al.*, 2002; Collins *et al.*, 2006; Shintani *et al.*, 2010). Therefore, findings from the current service evaluation and previous research indicate that assistance dogs may provide significant emotional and physical support to those with ASD and/or a PD.

Another commonly cited psychosocial benefit related to the development of the human-animal bond. Many service users expressed the value of companionship and unconditional love from the assistance dog. Service users often described the partnership with their assistance dog as a 'friendship', and expressed how they could not imagine their life without their dog, reflecting the perceived strength of this unique human-animal bond. This finding supports and extends insights related to potential mechanisms of benefits that have been previously identified. According to existing evidence, the companionship offered by an assistance dog may be one of the fundamental aspects underlying the positive impact of the relationship (Camp, 2001; Fairman and Huebner, 2001). However, this appeared to be an unexpected benefit for service users, as it was not frequently referred to when asked about goals and expectations prior to placement.

Other quality of life benefits were reported within a social context. For example, some service users expressed how the presence of their assistance dog had helped to increase awareness in the community and appeared to reduce stigma often associated with their or their child's diagnosis. This concept has been reported in previous research, as one study reported individuals with a PD experienced more social interaction with an assistance dog compared to those without (Hart *et al.*, 1987). Likewise, another study reported public perceptions became more positive towards children with ASD when they were with their assistance dog, subsequently increasing the parents' comfort in accessing the community (Appleby *et al.*, 2022). However, this was also not reported as an expectation prior to placement, suggesting the value of assistance dogs may extend beyond what is expected for these sub-populations. It is also noteworthy that current responses related to public perceptions were always framed positively, as other studies have reported experiences with discrimination due to being with an assistance dog in public, especially in the case of invisible disabilities or diversities (Davis *et al.*, 2004; Mills, 2017).

Quality of life benefits within a social context also extended beyond direct benefits to the service user, as they also appeared to benefit wider family dynamics. This was particularly evident for parents of children with ASD, who expressed the assistance dog had increased a sense of calmness in the household, enhanced the relationship between family members, and also offered them the opportunity to have more time for themselves. The assistance dog also appeared to reduce the strain of constant care or supervision previously required from the parent. Existing research has indicated the placement of an assistance dog into the lives of children with ASD and their families has supported overall family functioning (Lindsay and Thiyagarajah, 2021; Hellings *et al.*, 2022), as the dog is able to act as a social 'regulator' within the family unit and enhance family cohesion (Burrows *et al.*, 2008).

### CHALLENGES ASSOCIATED WITH ASSISTANCE DOG PLACEMENT

Despite the perceived benefits of an assistance dog, this service evaluation also highlighted some challenges associated with the partnership that should be considered when determining if an

assistance dog is the most appropriate support (Appleby *et al.*, 2022; Hellings *et al.*, 2022). The current service evaluation offers further considerations for families, organisations and charities regarding the placement of an assistance dog over time for service users with ASD and/or a PD and their families. The current data highlight some challenges that could be addressed to help service users and their families prepare for an assistance dog, specifically around the loss of the dog through retirement or illness, potential delays due to the matching process, and considerations around the time taken and adjustment process required when introducing and training the dog.

The loss of the assistance dog through retirement or illness is likely to cause intense feelings of grief due to the loss of their companion, but also one who fulfils caregiving and attachment needs. Previous studies have reported the grief experienced following the loss of an assistance or companion animal is similar to the grief response to losing a relative or friend (Appleby *et al.*, 2022). Moreover, this could be particularly challenging for a child with ASD who may have limited verbal skills and understanding (Burgoyne *et al.*, 2014; Appleby *et al.*, 2022). However, to date, there have been no studies exploring the long-term impacts which the loss of an assistance dog may have on an individual with ASD and/or a PD, so future research is required to consider the development of further targeted support strategies in these circumstances.

Findings from the current service evaluation also highlighted the difficulties associated with waiting for an assistance dog due to the rigorous compatibility matching process. Determinants of success in dog-owner dyads typically highlight aspects such as the age of the owner, or the number of household members (Pitteri *et al.*, 2014; Defelipe *et al.*, 2020; Lord *et al.*, 2020). However, many other factors should be considered such as personalities and skills of the human-dog dyad (Bender *et al.*, 2023a). While this process inevitably increases the success rate of compatible matches and subsequently the welfare of the dog (Bender *et al.*, 2023b), it can be time consuming and delays placement to service users. This delay was the primary reason cited for why service satisfaction ratings were not rated at the maximum score. Furthermore, if service users are waiting for a successor dog, this delay could exacerbate feelings of grief experienced from the loss of their predecessor assistance dog.

Finally, reported challenges also included the time taken to introduce and train the assistance dog and subsequent adjustment periods to the service users' lifestyle and routine, despite these not being anticipated prior to placement. Research has found that participants with an assistance dog described levels of frustration involved in this initial adjustment period of incorporating the dog into their routine and life (Camp, 2001), which could potentially be further exacerbated by specific training requirements in the current sub-populations. However, it is clear from the current responses that the continuous provision of support and advice ameliorated feelings of stress associated with these challenges. These insights into challenges could help to further inform assistance animal placement and assessment in the context of charities and organisations offering similar services.

## LIMITATIONS

We acknowledge a number of limitations to the current service evaluation. First, while questionnaires were adapted for children with ASD to complete their own questionnaires, parent-proxy reported data was more frequently collected to capture the views of children with ASD. This limited the sample of those who reported on their own behalf, so future service evaluations and research would benefit from including more self-reported data to capture the perceptions of children with ASD who may have unique experiences or face different challenges than those reported by their parents. Second, demographic data was limited and did not include data such as ethnicity, comorbid diagnoses and demographics of the dog (e.g., breed, origin), all of which could have impacted service user views. Additionally, as it was not compulsory for those placed

with assistance dogs to complete the questionnaires, there is a possibility that those who had positive experiences with their assistance dogs were more likely to share their experiences than those who had faced more significant challenges. Finally, the quality of life measure used in this service evaluation was not standardised as they had been adapted for ease of completion and appropriateness for the service users.

## CONCLUSION

This service evaluation deepens our understanding of the benefits of assistance dogs for individuals with ASD or a PD on a long-term basis. The findings suggest that in combination with the physical benefits the assistance dog is trained to provide, those with an assistance dog are likely to experience substantial psychosocial and emotional benefits from their dog's assistance and companionship, some of which may have been unanticipated prior to placement. In addition to the positive impact of the partnership, the service evaluation also identifies some of the challenges that being placed with an assistance dog may pose. These challenges are important considerations to prepare those anticipating the addition of an assistance dog into their lives and may assist charities, organisations and healthcare professionals to prepare service users prior to placement.

## CONFLICTS OF INTEREST

The authors declare no conflict of interest.

## ETHICS STATEMENT

The project was reviewed and approved as a service-related project by Dogs for Good. This was considered a service evaluation of existing data and there was no change to standard practice. All service users were provided with information sheets that explained the aims of the questionnaire and voluntary completion indicated consent.

## AUTHOR CONTRIBUTIONS

All authors contributed equally to the development of this article.

## FUNDING STATEMENT

This research received no external funding. [Two authors] are supported by the NIHR Yorkshire and Humber Applied Research Collaboration: <https://arc-yh.nihr.ac.uk/acknowledgements>.

## DATA AVAILABILITY

All relevant data are uploaded to the OSF repository and available at: <https://osf.io/sdbp9>.

## References

- Alderwick, H. and Dixon, J. (2019) The NHS long term plan. *BMJ* 364, l84. DOI: 10.1136/bmj.l84.
- Allen, B., Shenk, C.E., Dreschel, N.E., Wang, M., Bucher, A.M. *et al.* (2022) Integrating animal-assisted therapy into TF-CBT for abused youth with PTSD: A randomized controlled feasibility trial. *Child Maltreatment* 27(3), 466–477. DOI: 10.1177/1077559520988790.
- Appleby, R., Wright, S., Williams, L. and Stanley, M. (2022) Australian parents' experiences of owning an autism assistance dog. *Health & Social Care in the Community* 30(6), e4113–e4121.
- Assistance Dogs UK (2023) Available at: <https://www.assisteddogs.org.uk/> (accessed 1 June 2023).
- Bender, Y., Bräuer, J. and Schweinberger, S. (2023a) What makes a good dog-owner team?—A systematic review about compatibility in personality and attachment. *Applied Animal Behaviour Science* 260, 105857.
- Bender, Y., Matschkowski, T., Schweinberger, S. and Bräuer, J. (2023b) "An Aid with Soul" – Understanding the determinants of guide dog-owner compatibility from qualitative interviews. *Animals* 13(17), 2751. <https://www.mdpi.com/2076-2615/13/17/2751>.



- Berry, A., Borgi, M., Francia, N., Alleve, E. and Cirulli, F. (2012) Use of assistance and therapy dogs for children with autism spectrum disorders: A critical review of the current evidence. *The Journal of Alternative and Complementary Medicine* 19(2), 73–80. DOI: 10.1089/acm.2011.0835.
- Brooks, H.L., Rushton, K., Lovell, K., Bee, P., Walker, L., Grant, L. and Rogers, A. (2018) The power of support from companion animals for people living with mental health problems: A systematic review and narrative synthesis of the evidence. *BMC Psychiatry* 18(1), 31. DOI: 10.1186/s12888-018-1613-2.
- Burckhardt, C.S. and Anderson, K.L. (2003) The quality of life scale (QOLS): Reliability, validity, and utilization. *Health Qual Life Outcomes* 1, 60. DOI: 10.1186/1477-7525-1-60.
- Burgoyne, L., Dowling, L., Fitzgerald, A., Connolly, M., Browne, J. and Perry, I. (2014) Parents' perspectives on the value of assistance dogs for children with autism spectrum disorder: A cross-sectional study. *BMJ Open* 4(6), e004786. DOI: 10.1136/bmjopen-2014-004786.
- Burrows, K.E., Adams, C.L. and Spiers, J. (2008) Sentinels of safety: Service dogs ensure safety and enhance freedom and well-being for families with autistic children. *Qualitative Health Research* 18(12), 1642–1649.
- Calvo, P., Fortuny, J.R., Guzman, S., Macias, C., Bowen, J. et al. (2016) Animal assisted therapy (AAT) program as a useful adjunct to conventional psychosocial rehabilitation for patients with schizophrenia: Results of a small-scale randomized controlled trial [Psychotherapy & Psychotherapeutic Counseling 3310]. *Frontiers in Psychology* 7, 1–13. Available at: <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc13&NEWS=N&AN=2016-30789-001>.
- Camp, M.M. (2001) The use of service dogs as an adaptive strategy: A qualitative study. *The American Journal of Occupational Therapy* 55(5), 509–517. DOI: 10.5014/ajot.55.5.509.
- Carlisle, G.K. (2015) The social skills and attachment to dogs of children with autism spectrum disorder. *Journal of Autism and Developmental Disorders* 45, 1137–1145.
- Carr, E.C.J., Wallace, J.E., Onyewuchi, C., Hellyer, P.W. and Kogan, L. (2018) Exploring the meaning and experience of chronic pain with people who live with a dog: A qualitative study. *Anthrozoos* 31(5), 551–565. DOI: 10.1080/08927936.2018.1505267.
- Centers for Disease Control and Prevention (2023) Available at: <https://www.cdc.gov/index.htm> (accessed 14 January 2024).
- Clarke, V., Braun, V. and Hayfield, N. (2015) Thematic analysis. *Qualitative Psychology: A Practical Guide to Research Methods* 3, 222–248.
- Collins, D.M., Fitzgerald, S.G., Sachs-Ericsson, N., Scherer, M., Cooper, R.A. and Boninger, M.L. (2006) Psychosocial well-being and community participation of service dog partners. *Disability and Rehabilitation: Assistive Technology* 1(1–2), 41–48. DOI: 10.1080/09638280500167183.
- Crossman, M.K., Kazdin, A.E., Matijczak, A., Kitt, E.R. and Santos, L.R. (2020) The influence of interactions with dogs on affect, anxiety, and arousal in children. *Journal of Clinical Child & Adolescent Psychology* 49(4), 535–548. DOI: 10.1080/15374416.2018.1520119.
- Davis, B.W., Natrass, K., O'Brien, S., Patronek, G. and MacCollin, M. (2004) Assistance dog placement in the pediatric population: Benefits, risks, and recommendations for future application. *Anthrozoos: A Multidisciplinary Journal of The Interactions of People & Animals* 17, 130–145. DOI: 10.2752/089279304786991765.
- Defelipe, R., Savalli, C. and Otta, E. (2020) Demographics and self-reported well-being of Brazilian adults as a function of pet ownership: A pilot study. *Heliyon* 6(6), 1–6.
- Dollion, N., Grandgeorge, M., Saint-Amour, D., Hosein Poitras Loewen, A., François, N. et al. (2022) Emotion facial processing in children with autism spectrum disorder: A pilot study of the impact of service dogs [original research]. *Frontiers in Psychology* 13. DOI: 10.3389/fpsyg.2022.869452.
- Fairman, S.K. and Huebner, R.A. (2001) Service dogs: A compensatory resource to improve function. *Occupational Therapy In Health Care* 13(2), 41–52. DOI: 10.1080/J003v13n02\_03.
- Flanagan, J.C. (1982) Measurement of quality of life: Current state of the art. *Archives of Physical Medicine and Rehabilitation* 63(2), 56–59.
- Fodstad, J.C., Bauers, J., Sexton, M., Butler, M., Karlsson, C. and Neff, M. (2019) Development of an animal-assisted activity program on a pediatric behavioral health unit. *Complementary Therapies in Clinical Practice* 36, 153–157. DOI: 10.1016/j.ctcp.2019.07.001.
- GOV.UK (2018) Family Resources Survey: Financial Year 2017/18. Available at: <https://www.gov.uk/government/statistics/family-resources-survey-financial-year-201718> (accessed 16 February 2024).
- GOV.UK (2021) National Disability Strategy. Available at: [www.gov.uk/official-documents](http://www.gov.uk/official-documents) (accessed 16 February 2024).
- Gravrok, J., Howell, T., Bendrups, D. and Bennett, P. (2020) Thriving through relationships: Assistance dogs' and companion dogs' perceived ability to contribute to thriving in individuals with and without a disability. *Disability and Rehabilitation: Assistive Technology* 15(1), 45–53. DOI: 10.1080/17483107.2018.1513574.
- Hall, S.S., MacMichael, J., Turner, A. and Mills, D.S. (2017) A survey of the impact of owning a service dog on quality of life for individuals with physical and hearing disability: A pilot study. *Health and Quality of Life Outcomes* 15(1), 1–9.
- Hart, L.A., Hart, B.L. and Bergin, B. (1987) *Socializing Effects of Service Dogs for People with Disabilities*. Purdue University Press. DOI: 10.2752/089279388787058696.
- Harwood, C., Kaczmarek, E. and Drake, D. (2019) Parental perceptions of the nature of the relationship children with autism spectrum disorders share with their canine companion. *Journal of Autism and Developmental Disorders* 49, 248–259.
- Hellings, D., Joosten, A., Hatfield, M. and Netto, J. (2022) Benefits and challenges of assistance dogs for families of children on the autism spectrum: Mothers' perspectives. *Qualitative Health Research* 32(11), 1648–1656. DOI: 10.1177/1049732322111247.
- IAHAIO (2018) IAHAIO White Paper. *International Association of Human-Animal Interaction Organizations*.
- IBM Corp (2020) *IBM SPSS Statistics for Windows (Version 29.0)*. In IBM Corp.
- Isaacson, M. and Hellman, C. (2023) Examining the use of assistance dogs to enhance participation in everyday occupations for people with mobility challenges. *British Journal of Occupational Therapy* 86, 03080226231188013. DOI: 10.1177/03080226231188013.
- Janevic, M.R., Shute, V., Connell, C.M., Piette, J.D., Goesling, J. and Fynke, J. (2020) The role of pets in supporting cognitive-behavioral chronic pain self-management: Perspectives of older adults. *Journal of Applied Gerontology* 39(10), 1088–1096.
- Leung, J.Y.-L., Mackenzie, L. and Dickson, C. (2022) Outcomes of assistance dog placement in the home for individuals with autism spectrum disorder and their families: A pilot study. *Australian Occupational Therapy Journal* 69(1), 50–63. DOI: DOI: 10.1111/1440-1630.12768.
- Lindsay, S. and Thiagarajah, K. (2021) The impact of service dogs on children, youth and their families: A systematic review. *Disability and Health Journal* 14(3), 101012. DOI: 10.1016/j.dhjo.2020.101012.
- Lord, M.S., Casey, R.A., Kinsman, R.H., Tasker, S., Knowles, T.G. et al. (2020) Owner perception of problem behaviours in dogs aged 6 and 9-months. *Applied Animal Behaviour Science* 232, 105147.
- Mills, M.L. (2017) Invisible disabilities, visible service dogs: The discrimination of service dog handlers. *Disability & Society* 32(5), 635–656. DOI: 10.1080/09687599.2017.1307718.
- National Institute for Health and Care Excellence (2022) Disabled Children and Young People Up to 25 with Severe Complex Needs: Integrated Service Delivery and Organisation Across Health, Social Care and Education. Available at: [www.nice.org.uk/guidance/ng213](http://www.nice.org.uk/guidance/ng213) (accessed 16 February 2024).
- NHS (2021) Core20PLUS5 (adults) – An Approach to Reducing Healthcare Inequalities 2021. Available at: <https://www.england.nhs.uk/about/equality/equality-hub/national-healthcare-inequalities-improvement-programme/core20plus5/> (accessed 23 November 2023).
- NHS (2022) Core20PLUS5 – An approach to reducing health inequalities for children and young people 2022. Available at: <https://www.england.nhs.uk/about/equality/equality-hub/national-healthcare-inequalities-improvement-programme/core20plus5/core20plus5-cyp/> (accessed 23 November 2023).
- NHS England (2020) Autism Waiting Time Statistics – Quarter 1 to quarter 4 2019–20 and Quarter 1 (April to June) 2020–21. Available at: <https://digital.nhs.uk/data-and-information/publications/statistical/autism-statistics/q1-april-to-june-2020-21/data-quality-copy> (accessed 16 February 2024).

- NHS England (2023) A National Framework to Deliver Improved Outcomes in All-Age Autism Assessment Pathways: Guidance for Integrated Care Boards. Available at: <https://www.england.nhs.uk/long-read/a-national-framework-to-deliver-improved-outcomes-in-all-age-autism-assessment-pathways-guidance-for-integrated-care-boards/> (accessed 23 November 2023).
- O'Haire, M.E., McKenzie, S.J., Beck, A.M. and Slaughter, V. (2013) Social behaviors increase in children with autism in the presence of animals compared to toys. *PLoS One* 8(2), e57010. DOI: 10.1371/journal.pone.0057010.
- Pitteri, E., Mongillo, P., Adamelli, S., Bonichini, S. and Marinelli, L. (2014) The quality of life of pet dogs owned by elderly people depends on the living context, not on the owner's age. *Journal of Veterinary Behavior* 9(2), 72–77.
- Rintala, D., Sachs-Ericsson, N. and Hart, K.A. (2002) The effects of service dogs on the lives of persons with mobility impairments: A pre-post study design. *SCI Psychosocial Process* 15, 70–82.
- Rodriguez, K.E., Bibbo, J. and O'Haire, M.E. (2020a) The effects of service dogs on psychosocial health and wellbeing for individuals with physical disabilities or chronic conditions. *Disability and Rehabilitation* 42(10), 1350–1358. DOI: 10.1080/09638288.2018.1524520.
- Rodriguez, K.E., Greer, J., Yacilla, J.K., Beck, A.M. and O'Haire, M.E. (2020b) The effects of assistance dogs on psychosocial health and wellbeing: A systematic literature review. *PLoS One* 15(12), e0243302. DOI: 10.1371/journal.pone.0243302.
- Ryan, S. and Ziebland, S. (2015) On interviewing people with pets: Reflections from qualitative research on people with long-term conditions. *Sociology of Health & Illness* 37(1), 67–80. DOI: 10.1111/1467-9566.12176.
- Shintani, M., Senda, M., Takayanagi, T., Katayama, Y., Furusawa, K. et al. (2010) The effect of service dogs on the improvement of health-related quality of life. *Acta Medica Okayama* 64(2), 109–113. DOI: 10.18926/amo/32851.
- Tseng, A. (2023) Brief report: Above and beyond safety: Psychosocial and biobehavioral impact of autism-assistance dogs on autistic children and their families. *Journal of Autism and Developmental Disorders* 53(1), 468–483.
- UK Parliament (2022) The treatment of autistic people and people with learning disabilities: Government Response to the Committee's Fifth Report of Session 2021–22. Available at: <https://publications.parliament.uk/pa/cm5803/cmselect/cmhealth/631/report.html> (accessed 3 March 2024).
- Viau, R., Arsenault-Lapierre, G., Fecteau, S., Champagne, N., Walker, C.-D. and Lupien, S. (2010) Effect of service dogs on salivary cortisol secretion in autistic children. *Psychoneuroendocrinology* 35(8), 1187–1193.
- Vincent, C., Gagnon, D.H. and Dumont, F. (2019) Pain, fatigue, function and participation among long-term manual wheelchair users partnered with a mobility service dog. *Disability and Rehabilitation: Assistive Technology* 14(2), 99–108. DOI: 10.1080/17483107.2017.1401127.
- Walther, S., Yamamoto, M., Thigpen, A.P., Garcia, A., Willits, N.H. and Hart, L.A. (2017) Assistance dogs: Historic patterns and roles of dogs placed by ADI or IGDF accredited facilities and by non-accredited U.S. facilities. *Frontiers in Veterinary Science* 4, 1. DOI: 10.3389/fvets.2017.00001.
- Wells, D.L. (2009) Associations between pet ownership and self-reported health status in people suffering from chronic fatigue syndrome. *The Journal of Alternative and Complementary Medicine* 15(4), 407–413. DOI: 10.1089/acm.2008.0496.
- Wijker, C., Leontjevas, R., Spek, A. and Enders-Slegers, M.-J. (2020) Effects of dog assisted therapy for adults with autism spectrum disorder: An exploratory randomized controlled trial. *Journal of Autism and Developmental Disorders* 50(6), 2153–2163.
- Winkle, M., Crowe, T.K. and Hendrix, I. (2012) Service dogs and people with physical disabilities partnerships: A systematic review. *Occupational Therapy International* 19(1), 54–66. DOI: 10.1002/oti.323.
- Wright, H., Hall, S., Hames, A., Hardiman, J., Mills, R., Team, P.P. and Mills, D. (2015) Pet dogs improve family functioning and reduce anxiety in children with autism spectrum disorder. *Anthrozoos* 28(4), 611–624.