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Research article

What do keepers prioritise when evaluating animal welfare? A content analysis of primate caregiver perspectives on welfare

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Abstract
Assessing the welfare of captive primates is essential for optimising their welfare outcomes. Various frameworks, such as the Five Domains Model, are used to evaluate welfare, yet challenges remain due to individual differences and variety in past experiences between animals. Caregivers play a crucial role in welfare assessments, offering valuable insights through daily observations. However, little research has explored what welfare indicators caregivers prioritise when making their assessments. This study employed conventional content analysis to examine 141 free-text responses from 15 caregivers across five primate sanctuaries, identifying key themes in welfare evaluations. Free-text responses were justifications of welfare ratings and related to a welfare assessment of a particular individual. Seven themes were identified: social interactions, behaviour, physical health, mental state, environment, recovery from past experiences, and nutrition. Social factors were the most frequently mentioned, with all caregivers emphasising the importance of group dynamics and relationships in their assessments. Behavioural indicators, physical health, and mental state were also commonly referenced, highlighting the multidimensional nature of welfare assessments. Notably, few caregivers mentioned choice and control in the environment, despite its established importance in welfare science. Understanding caregivers' perspectives provides valuable insights for refining welfare assessment tools, ensuring they align with both scientific frameworks and practical considerations, and that welfare scores are consistent between raters.

Introduction

Assessing the welfare of captive primates is essential for ensuring positive welfare outcomes in captivity. Welfare assessments are necessary to monitor physical and mental health, identify potential environmental stressors, and implement improvements that enhance overall quality of life (QoL) (Lambeth et al. 2013; Baker et al. 2014; Brando and Buchanan-Smith 2018). These assessments are typically based on established frameworks (described below) that define the scope of welfare for captive primates. These frameworks provide a standardisation of the range of welfare-related behaviours included in assessments. However, beyond the standardised tools, individual raters may try to include personal opinions, beliefs and previous experience as important factors that affect their judgements. Therefore, research to better understand what expert keepers prioritise when assessing animal welfare is needed. The current study investigates the ways in which evaluators of the welfare of captive primates might explain and justify their ratings.

Existing Frameworks

One of the earliest and most influential frameworks for assessing welfare was the Five Freedoms of Animal Welfare, developed in the late 1960s by the Farm Animal Welfare Council in response to growing concerns about the treatment of intensively farmed animals (Farm Animal Welfare Council 1994; Fathurahman and Jamilah 2019). These freedoms include freedom from hunger and thirst; freedom from discomfort; freedom from pain, injury, and disease; freedom from fear and distress; and freedom to express normal behaviour. These freedoms provided a foundational, resource-based (i.e. welfare is rated based on resource availability and quality) approach to evaluating welfare (Farm Animal Welfare Council 1994; McCulloch 2013). Although originally designed for farm animals, the Five Freedoms have since been applied to a variety

of captive species, including zoo-housed primates (Mäekivi 2018). However, as the field progressed, it became evident that more comprehensive and nuanced assessment tools were required. For instance, the Five Domains Model (Mellor and Reid 1994; Mellor and Beausoleil 2015; Mellor and Burns 2020) expands on the Five Freedoms by incorporating subjective experiences and emotional states, evaluating nutrition, environment, physical health, behaviour, and mental state to provide a more holistic understanding of welfare. Other welfare measures, such as Qualitative Behavioural Assessment (QBA) (Wemelsfelder and Lawrence 2001), focus on the interpretation of animal emotional expression in the present moment, while the incorporation of physiological indicators like cortisol levels (Stockman et al. 2011; 2012) further strengthen welfare assessments. Nevertheless, assessing animal welfare remains challenging due to individual differences between animals in terms of behaviour, coping strategies, and life histories (Richter and Hintze 2019). Despite these complexities, the ongoing refinement of welfare assessment methods remains crucial to improving care, enrichment, and overall welfare outcomes for captive primates.

Contributors to welfare

Welfare assessments aim to evaluate multiple aspects of an animal's physical and psychological state, and therefore commonly incorporate a range of behavioural, social, health, and environmental indicators. These indicators have been shown to provide complementary information about an individual's welfare and are particularly important when assessing rescued primates, whose welfare may be influenced by complex life histories. Social interactions are considered a fundamental component of welfare, as strong social bonds enhance coping mechanisms and improve resilience to stress (Kalcher-Sommersguter et al. 2013), whereas social deprivation can result in elevated cortisol levels and the expression of abnormal behaviours (Levine et al. 1985; Reinhardt and Rossell 2001). Behavioural indicators are also central to welfare assessment because both species-typical behaviours, such as grooming and foraging, and abnormal behaviours, including stereotypies and self-injury, provide valuable insight into an individual's welfare state (Wemelsfelder 2007; Gottlieb et al. 2015). In addition, physical and mental health are essential components of welfare, with the early detection of illness or injury allowing timely intervention to improve welfare outcomes (Dawkins 2006). Environmental conditions also contribute substantially to welfare, as enclosure size and environmental complexity influence opportunities for cognitive stimulation and can affect stress levels (Reinhardt et al. 1996; Reamer et al. 2010). For rescued primates, welfare recovery is often gradual, with many individuals showing improvements over time following rescue (Llorente et al. 2015). Consequently, comprehensive welfare assessments that integrate behavioural, social, health, and environmental measures are essential for monitoring rehabilitation and evaluating long-term welfare outcomes.

Caregiver assessment validity

Caregivers play a vital role in assessing welfare as they engage in daily observations of the animals in their care. Therefore, the familiarity of caregivers with the focal animals may allow for a nuanced interpretation of welfare (Hammerton et al. 2019; Williams et al. 2019). Additionally, caregiver ratings of primate welfare have been shown to be reliable between raters and stable over time (Robinson et al. 2017; 2018). Methods used to assess welfare by caregivers may include behavioural assessments, health monitoring, and qualitative evaluations (Lambeth et al. 2013; Baker et al. 2014; Laméris et al. 2021). Qualitative measures are useful, as they focus on subjective caregiver impressions rather than strict quantitative measures (Wemelsfelder 2007). A method that may be used to gain insight into these qualitative measures is content analysis (Berelson 1952), which helps researchers systematically identify recurring themes in caregiver responses (Vaismoradi et al. 2013; Kyngäs 2020), providing valuable insights into the factors caregivers prioritise when assessing welfare. At present, we are not aware of any published studies that have explored which welfare factors caregivers consider most important or how caregivers' assessments align with established welfare models.

While much research has focused on welfare indicators for captive primates, there is a lack of research into how caregivers think about welfare and how they prioritise particular welfare indicators when completing assessments. Understanding caregivers' perspectives is essential for improving welfare assessment practices, as caregivers make many of the daily decisions that impact animal welfare (Bacon 2023). Additionally, it is important to understand whether all raters are assessing various aspects of welfare and using welfare assessments in the same way, as well as if they have differing levels of animal welfare knowledge, to ensure consistency between rater scores. To address this knowledge gap, the current study uses content analysis to identify themes that caregivers consider most important in welfare assessments. Gaining an understanding of this topic may lead to improvements in the validity and reliability of welfare assessments by assuring consistency and involving users and key audiences in the development of new measures, as is often seen in human clinical practice in the form of patient and public involvement groups (Légaré et al. 2011). The main aims of the current study were 1) to gain an understanding of how caregivers assess animal welfare for a cohort of rescued primates and 2) to gain an understanding of how caregivers prioritise particular welfare indicators in their approach to welfare assessment.

Methods

Ethical approval

This study was approved by the University of Winchester's Health and Wellbeing Ethics Lead on 14 February 2023, ethical approval number HWB_REC_230105.

Study Sample

Fifteen caregivers from five participating primate sanctuaries (Table 1) were recruited for this study to assess the welfare of 45 primates (M raters per primate = 3.1, SD = 0.6) (Table 2). Please note that our sample only included sanctuaries and not zoos. Caregivers were eligible to participate only if they had provided regular care for each focal primate for at least six months. This criterion aligns with recommendations from previous research (e.g. Freeman et al. 2010; Hopper et al. 2018), which highlights the enhanced reliability of assessments conducted by observers with long-term familiarity with their primates (Greenall et al. 2022). Full details of the species, sex, and age of all primates included in the current study are presented in Supplementary Table 1.

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Data Collection

As part of a larger welfare questionnaire (Parry-Howells et al. in preparation), caregivers provided a welfare score (on a scale of worst possible welfare to best possible welfare) for primates in their care and a free-text explanation for these scores. Specifically, caregivers were instructed to "provide a reason for your overall welfare score for this primate". Data collection took place between May 2023 and February 2024 and was conducted by sending out the questionnaires to all participating caregivers. All 141 possible free-text responses were completed by caregivers. The current study is focused strictly on the free-text explanations, not the numeric welfare scores.

Table 1. Details of the location, gender, position, and years of experience of caregivers (raters) participating in the current study.

Location	Gender	Position	Length of experience with individual primates (in years)
United Kingdom	Female	Manager	6.9
United Kingdom	Male	Caregiver	4.4
United Kingdom	Female	Caregiver	2.3
United Kingdom	Female	Caregiver	4.4
Spain	Male	Manager	13.3
Spain	Male	Caregiver	7
Spain	Male	Caregiver	4
United Kingdom	Female	Caregiver	13
United Kingdom	Female	Caregiver	4
United Kingdom	Male	Manager	4.5
United States of America (Midwest)	Female	Caregiver	4
United States of America (Midwest)	Female	Manager	4
United States of America (Midwest)	Female	Caregiver	4.2
United States of America (Pacific Northwest)	Male	Manager	8.8
United States of America (Pacific Northwest)	Female	Caregiver	1.5

Note. Rater names have been replaced with letters to ensure anonymity of participants.

Content Analysis

A conventional content analysis approach was used to analyse caregivers' free-text responses, following established guidance for inductive qualitative coding (Hsieh and Shannon 2005; Elo and Kyngäs 2008). This method is commonly used when existing theory or research is limited, allowing categories to be derived directly from the data rather than imposed a priori. All responses were read repeatedly to ensure familiarity with the data. An initial phase of open coding was then conducted in NVivo 14, during which meaningful phrases were identified and assigned descriptive codes capturing key aspects of welfare-related content (e.g., references to social relationships or physical condition). Codes were developed inductively from the dataset and were not based on pre-existing coding frameworks.

Following this, similar codes were grouped into higher-order categories (themes) through an iterative process of comparison and abstraction. For example, codes relating to "quality of relationships with conspecifics" and "rank or social standing" were grouped under the broader social theme, while codes relating to abnormal behavioural expressions and enrichment use were grouped under the behaviour theme. This process resulted in a hierarchical coding framework comprising overarching welfare themes and their associated subcodes. Each segment of text could be assigned to more than one code where appropriate, as responses often contained multiple welfare considerations. Themes were not mutually exclusive at the level of participant responses, reflecting the multidimensional nature of welfare assessments.

Results

A conventional content analysis of caregivers' free-text responses identified seven themes explaining their welfare ratings for each primate (Figure 1). A summary of key themes identified by the content analysis is illustrated by Figure 2, which presents the hierarchical coding framework developed through analysis. Themes represent broad domains of welfare, with subcodes reflecting specific concepts within each domain. Categories are conceptually distinct but not mutually exclusive at the response level, as individual caregiver responses could contain references to multiple welfare domains

When explaining the rationale behind their welfare scores, all participants (100%, 15/15) referenced the social theme, which encompassed interactions between primates as well as their relationships with caregivers. Specifically, 86.7% (13/15) of participants highlighted the primates' rank or social standing within the group. Other aspects within the social theme included the primates' relationships with conspecifics and/or other primates, and whether these relationships were positive or negative (73.3%, 11/15). Additionally, most participants (73.3%, 11/15) commented on the social dynamics of the group with which the primate was housed. Other social factors noted included experiences of social isolation and/or exclusion (66.7%, 10/15), dominance or submissiveness in interactions (60%, 9/15), and the quality of relationships with caregivers (53.3%, 8/15).

Another commonly mentioned theme was the primates' behaviour, cited by 93.3% (14/15) of participants. The most frequently discussed aspect within this theme was whether the

Table 2. Summary of the species, sex, and age distribution of primates included in the current study.

Species	Total (N)	Sex		
		Male (N)	Female (N)	Age (years)
Barbary macaque *Macaca sylvanus*	1	0	1	13
Black and white colobus *Colobus guereza*	1	0	1	18
Black-headed spider monkey *Ateles fusciceps*	2	1	1	42.5 (39 – 46)
Chimpanzee *Pan troglodytes*	17	9	8	34.0 (20 – 49)
Common marmoset *Callithrix jacchus*	1	0	1	4
Common squirrel monkey *Saimiri sciureus*	1	0	F	22
Grivet monkey *Chlorocebus aethiops*	1	1	0	23
Javan Langur *Trachypithecus auratus*	1	1	0	17
Lar gibbon *Hylobates lar*	1	0	1	18
Müller's gibbon *Hylobates muelleri*	1	0	1	28
Red-faced spider monkey *Ateles paniscus*	2	1	1	25.5 (14 – 37)
Rhesus macaque *Macaca mulatta*	7	7	0	13.0 (8 – 18)
Siamang *Symphalangus syndactylus*	1	1	0	26
Tufted capuchin *Sapajust apella*	3	3	0	30.7 (23 – 36)
Vervet monkey *Chlorocebus pygerythrus*	3	2	1	19.0 (5 – 30)
White-headed marmoset *Callithrix geoffroyi*	1	1	0	2
White-throated capuchin *Cebus capucinus*	1	0	1	24

primate engaged with or derived enjoyment from enrichment (60.0%, 9/15). Abnormal behaviours or behavioural concerns, including stereotypies and self-injurious behaviours, were referenced by 53.3% (8/15) of participants in their explanations of welfare ratings. Exploratory behaviour was identified as a separate behavioural code, with 46.7% (7/15) of participants discussing whether the primate exhibited exploratory behaviour.

The third most prevalent theme identified was physical health

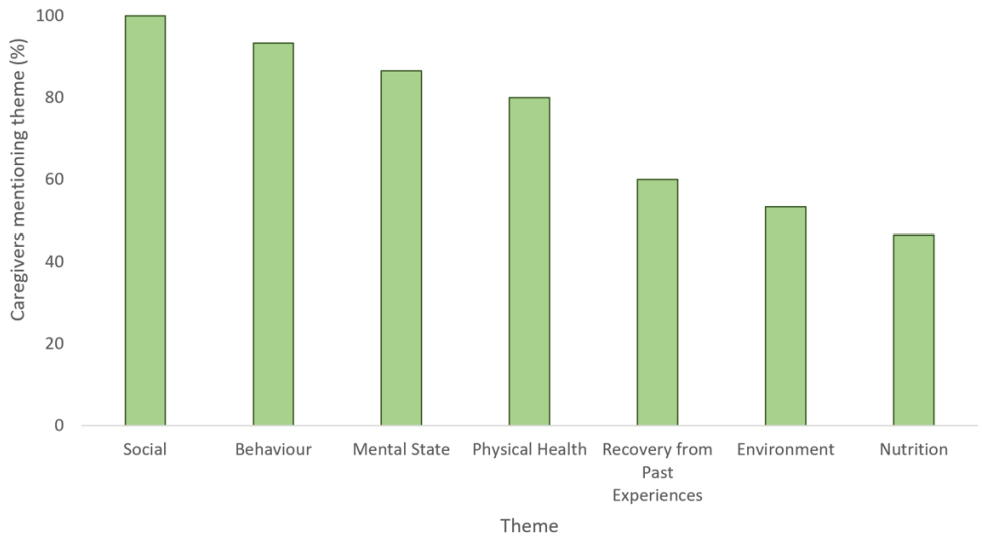

Figure 1. Percentage of caregivers (n=15) mentioning each theme as part of their welfare assessments for rescued primates.

(80%, 12/15). Within this theme, 66.7% (10/15) of participants referred to general health, using descriptions such as "overall a healthy monkey" and "detrimental health." Additionally, 53.3% (8/15) of participants mentioned specific health conditions or symptoms, including "epileptic seizures" and "she suffers from respiratory issues." The code relating to body condition was referenced by 46.7% (7/15) of participants and included details on weight, muscle tone, and body condition score.

The primates' mental state was discussed by 86.7% (13/15) of participants. The majority of participants (80.0%, 12/15) referred to personality traits in their welfare assessments, with illustrative statements such as "she has a nervous temperament" and "he is rather positive and tends to be in a happy mood." Arousal levels were mentioned by 46.7% (7/15) of participants, focusing on stress and relaxation, either generally or in response to specific stimuli such as social interactions or confinement indoors. Notably, only one participant commented on whether primates had choice and control in their daily lives.

The environmental theme was identified in responses from 53.3% (8/15) of participants. The most frequently discussed aspect within this theme was the quality of the primates' enclosures (53.3%, 8/15), with participants addressing factors such as enclosure size, cleanliness, and areas requiring improvement. Additionally, 20.0% (3/15) of participants mentioned the extent to which the environment met the primates' needs and provided them with freedom.

Another identified theme pertained to the primates' recovery, or lack thereof, from past experiences, including their adaptation to sanctuary life. This theme was referenced by 60.0% (9/15) of participants. Illustrative examples include: "he has settled into our sanctuary beautifully," "she seems to bear more emotional scars from her past," and "he has responded well to rehabilitation since being confiscated."

Finally, the theme of nutrition was mentioned by 46.7% (7/15) of participants. When discussing this theme, 20.0% (3/15) of participants referred to appetite, 26.7% (4/15) discussed issues related to overconsumption or food-related intensity, and 13.3% (2/15) commented on diet quality.

Discussion

The content analysis identified seven themes: social, behaviour, physical health, mental state, environment, recovery from past experiences, and nutrition. To the best of the authors' knowledge, this is the first study that has implemented content analysis to investigate the factors that caregivers focus on when assessing animal welfare. It can be inferred that the frequency with which each theme is mentioned indicates how important it is to the caregivers, as this "quasi-statistical" method is sometimes employed to assess the weight that participants place on particular themes (Fogarty and Ramjan 2016).

The most frequently mentioned theme by caregivers was the social theme, a finding that aligned well with existing literature. Social factors are critical for primate welfare, influencing social competence, overall welfare, and the ability to cope with stress (Reimers et al. 2007; Kalcher-Sommersguter et al. 2013). Additionally, social companionship has been identified as a key contributor to the welfare of captive chimpanzees (Angley et al. 2024). Conversely, a lack of social contact has been linked to adverse welfare outcomes. For instance, social isolation has been associated with increased blood cortisol levels (Levine et al. 1985), the development of behavioural issues (Reinhardt and Rossell 2001; Bee 2017), and reduced social competence (Freeman and Ross 2014) in primates. However, social environments are not inherently beneficial, as incompatible group compositions in captivity or unstable social relationships can also act as stressors and negatively affect welfare (Olsson and Westlund 2007). Furthermore, group-living chimpanzees (in comparison to solo and pair-housed chimpanzees) have been found to be more playful, sociable, and intelligent (Murray 1998), further highlighting the importance of social factors. Therefore, it was unsurprising that caregivers placed the greatest emphasis on social factors when assessing welfare.

The second most frequently mentioned theme was primate behaviour, encompassing aspects such as the expression of natural behaviours, abnormal behaviours, and engagement with enrichment. This finding was consistent with the literature, as

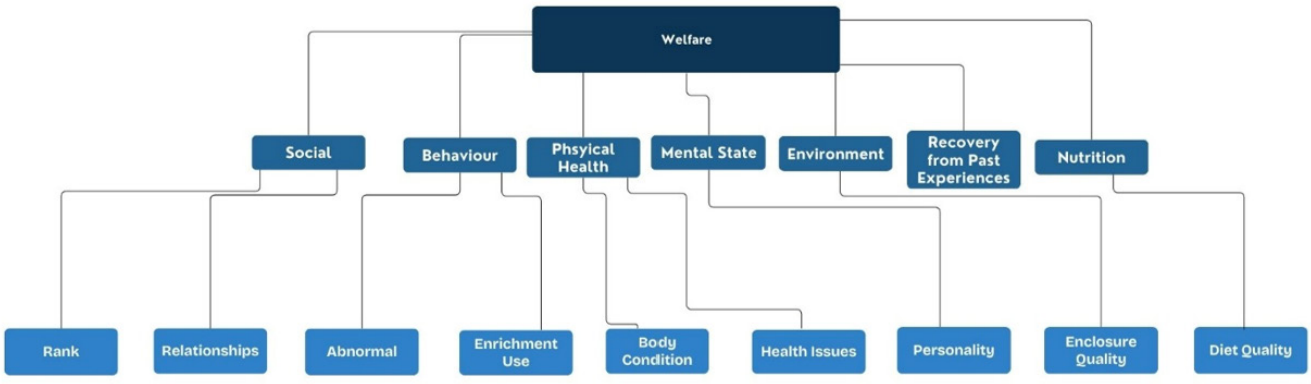

Figure 2. Hierarchical representation of caregiver responses (n=15), showing themes and a summary of key codes related to welfare assessments for rescued primates.

behaviour is widely used as an indicator of welfare in primates. Behaviour serves as an important animal-based measure, providing insight into an individual's internal state (Wemelsfelder 2007). Caregivers frequently rely on behavioural indicators to assess welfare, with agonistic (Baker 2004), stereotypic (Gottlieb et al. 2015), and abnormal behaviours (Vandeleest et al. 2011) commonly used to identify negative welfare states. Positive behavioural indicators, although less commonly utilised, include maintenance behaviours such as grooming and feeding (Volfová et al. 2019) and species-specific behaviours (Röder and Timmermans 2002; Costa et al. 2018). Given the established role of behaviour in welfare assessments, it was expected that caregivers would consider it an important factor.

The third most frequently mentioned theme was physical health, which is fundamental to the welfare of all animals (Dawkins 2006). Primate caregivers are trained to identify health issues promptly, as untreated conditions can significantly impact welfare (Harley and Clark 2019). Health indicators are often regarded as more objective and easily observable than behavioural indicators. Monitoring physical health enables caregivers to detect early signs of illness or injury that, if left untreated, could lead to negative welfare outcomes (Matthews et al. 2016). Furthermore, physical health has been recognised as a key component of QoL assessments for captive primates (Lambeth et al. 2013). Therefore, the prominence of this theme in caregivers' welfare assessments was anticipated.

The next most frequently mentioned theme was the primates' mental state, which included considerations of their general disposition and personality traits. Mental state is increasingly recognised as a crucial component of animal welfare, as it directly influences an individual's overall welfare and capacity to engage with their environment. Caregivers did not mention whether the animals had freedom from negative emotional states such as fear and distress, suggesting that they were not approaching welfare from a Five Freedoms perspective. However, the emphasis placed on mental state by caregivers supports the application of the Five Domains model in animal welfare research, as this framework is based on the inference of the mental domain from the physical domains (Mellor and Beausoleil 2015; Mellor 2017; Mellor and Burns 2020). This model acknowledges that factors such as nutrition, physical health, environment, and behaviour all contribute to an animal's affective experience, highlighting the importance of considering mental state in welfare assessments. Given the growing recognition of animal sentience and the role of emotions in welfare science, it is unsurprising that caregivers placed importance on this theme. By assessing an individual's mental state alongside physical and behavioural indicators, caregivers can develop a more comprehensive understanding of overall welfare and implement appropriate interventions when necessary.

The theme of environment was also identified by the content analysis. Previous research has demonstrated the importance of a primate's environment, particularly early-life environmental conditions, in shaping lifelong welfare outcomes. For example, primates housed in small enclosures (Reamer et al. 2010) or enclosures lacking complexity (Reinhardt et al. 1996) are more likely to develop self-directed and abnormal behaviours such as self-scratching and pacing. Furthermore, physical resources are considered to be of high importance in welfare assessments of captive animals in zoological settings (Harley and Clark 2019). Interestingly, it was encouraging that caregivers did not consider the environment to be the most critical factor, as this supports the shift from resource-based welfare assessments towards more animal-centric welfare assessments.

Caregivers also identified the extent to which primates had recovered from past experiences as an important theme. Although literature on welfare recovery in rescued primates remains relatively limited, existing studies suggest that welfare tends to improve over time (Llorente et al. 2015; Feliu et al. 2022). It is crucial for caregivers to consider an individual's past experiences when assessing their current welfare, as recovery rates vary among individuals (Llorente et al. 2015). Longitudinal welfare tracking allows caregivers to identify primates who may require additional interventions. Rehabilitation efforts, including physical or social rehabilitation, have been linked to improved welfare outcomes in primates (Martin 2002). Furthermore, similar findings have been shown in rescued dogs (Canis lupus familiaris), with rehabilitation being linked to improved behavioural and welfare outcomes (Orihel and Fraser 2008; Demirbas et al. 2017). The consideration of past experiences in welfare assessments suggests that caregivers recognise the impact of historical factors on present welfare states.

The final theme identified was nutrition. This finding is supported by recent research indicating that zookeepers prioritise the nutritional aspects of animal welfare, likely due to the extensive information available on recommended diets (Pomatti 2023). However, in contrast to previous findings, the current study found that nutrition was the least frequently mentioned theme. This discrepancy suggests potential differences in welfare assessment priorities between zookeepers and caregivers in sanctuaries, highlighting an area for further research. Furthermore, in sanctuaries, diets are typically determined by veterinarians and nutritionists rather than caregivers. As caregivers generally have little authority to modify feeding regimes, despite the considerable differences between captive and wild diets (Hammerton et al. 2019), they may feel constrained from acting on nutritional concerns and consequently rank nutrition as a lower welfare priority.

Overall, the themes identified in this study were largely consistent with existing literature regarding factors influencing primate welfare. However, an unexpected finding was that only one caregiver mentioned the importance of choice and control within the environment. Due to the limited mention of this code, it was not included as a theme in the content analysis. Given the well-documented importance of choice and control for primate welfare, and the growing trend in welfare literature to discuss the importance of agency (Bernstein-Kurtycz et al. 2014; Englund and Cronin 2023; Angley et al. 2024), this result has implications for practitioners as it may suggest a lack of educational or professional development opportunities relating to this topic. This suggests that further training may be beneficial to empower caregivers to provide opportunities for primates to experience choice and control within their environment, and, therefore, foster positive welfare outcomes.

This study employed an inductive approach to content analysis, which facilitated the identification of themes without preconceived expectations based on previous research. Such an approach has been recognised for its ability to generate novel insights and perspectives (Kyngäs 2020). Additionally, conventional content analysis provided a deeper and more nuanced understanding of caregiver responses compared to numerical welfare scores alone. This method was particularly valuable, as previous studies had not explored the rationale behind caregiver welfare ratings in this manner. Furthermore, gaining an understanding of whether raters are using a tool in the same way, as was done in this study, can help to improve the reliability of a tool by ensuring consistency between raters. The use of conventional content analysis, thus, allowed for a more comprehensive understanding of the factors influencing caregiver assessments.

Despite its strengths, conventional content analysis presents certain limitations. Firstly, the manual analysis of large datasets is time-consuming, making it less feasible for studies with extensive

sample sizes (Krippendorff 2018). Additionally, while the quasi-statistical approach used to summarise the frequency of themes can help identify patterns within the data, these frequencies should not be interpreted as equivalent to formal statistical inference and should instead be considered alongside the broader qualitative context (Fogarty and Ramjan 2016). However, the integration of content analysis with quantitative data analysis, as implemented in this study, mitigates this limitation by allowing for cross-validation between different data sources (White and Marsh 2006). While content analysis provides valuable insights into qualitative data, these limitations must be considered when determining its suitability for future research.

Conclusions

This study addressed a notable gap in the literature by investigating the factors that caregivers prioritise when assessing primate welfare. Through content analysis, seven key themes were identified: social, behaviour, physical health, mental state, environment, recovery from past experiences, and nutrition. These themes aligned with the Five Domains framework and existing literature on the contributors to welfare outcomes in captive primates. Despite its limitations, the use of conventional content analysis provided a nuanced understanding of caregiver assessments. This novel application of content analysis has significant implications for enhancing the accuracy and reliability of welfare assessments and informing best care practices. The findings also underscore the need for ongoing training among caregivers and highlight opportunities for future research to explore additional factors influencing welfare assessments. Furthermore, the application of this method in future studies would be beneficial in expanding the understanding of caregiver-based welfare evaluations.

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