



Original Article

Development and preliminary psychometric evaluation of an owner-completed measure of feline quality of life

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ARTICLE INFO

Article history:

Accepted 11 October 2017

Keywords:

Feline
Quality of life
Questionnaire development
Health-related quality of life
Healthy cat

ABSTRACT

Due to improved healthcare and pet longevity, measurement of health-related quality of life (HRQoL) is increasingly important in companion animal medicine. The aim of this study was to develop and evaluate the content and psychometric properties of an owner-completed assessment of health and quality of life (QoL) in cats for use in general veterinary clinical practice. A 23-item feline QoL measure, drafted based on findings from an online survey completed by 45 pet owners, was revised following qualitative interviews with 10 pet owners of healthy cats to assess content validity. The resulting 22-item measure was completed twice by 199 owners of healthy cats to assess the reliability and validity of the measure via psychometric evaluation, including assessment of missing data, item response distributions, item correlations, factor analysis, internal consistency, test–retest reliability, multi-trait analysis, known groups analyses and estimation of minimally important differences. There were no missing data. Responses for all items were heavily skewed due to the sample being healthy. Analysis of items and factor analysis supported deletion of six items and calculation of two domain scores and a total score. Internal consistency and test–retest reliability were strong for all domains (0.70–0.80), indicating good reliability. All but three items demonstrated strong item convergent validity (item-scale correlation > 0.40) and correlated highest with their respective domain (item discriminant validity). Significant between-group differences in scores differing according to a global impression of feline health item provided evidence of discriminative validity. Findings provide evidence that the final 16-item feline QoL measure has strong cross-sectional psychometric properties.

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Introduction

Due to improved healthcare and longevity, health-related quality of life (HRQoL) has been increasingly studied in companion animals (Niessen et al., 2010; Lynch et al., 2011; Lavan, 2013). HRQoL is considered a multi-dimensional concept (Lavan, 2013; Mullan, 2015), representing both physical (including comfort/discomfort) and non-physical factors (feelings felt by animals). Assessing these concepts in animals in a valid and reliable way is challenging (McMillan, 2000). However, measuring HRQoL can help to influence treatment decisions, and aid veterinarians and pet owners in tracking changes in HRQoL over time. The Food and Drug Administration (FDA) patient-reported outcome (PRO) guidance¹ outlines robust methods for the development and validation

of human PROs and HRQoL measures (Campbell and Fiske, 1959; Nunnally, 1994; Marquis et al., 2006; Streiner et al., 2008; Lasch et al., 2010). Such methods have been applied to companion animal HRQoL measures, using in-depth qualitative research in the target population (i.e. pet owners), to identify relevant concepts (McMillan, 2000; Niessen et al., 2010; Lynch et al., 2011), and to inform question (item) development and comprehensiveness of concepts assessed, as well as reliability and validity using statistical methods. Validity establishes whether measures assess concepts they were designed to measure; reliability indicates the accuracy of assessing responses over time (Yeates and Main, 2009).¹

Arguably, challenges in developing an animal HRQoL assessment are similar to those in developing observer-reported outcome (ObsRO) measures in non-verbal human paediatric populations (Patrick et al., 2011; Arbuckle and Abetz-Webb, 2013); there is a need to measure observable behaviours that can be accurately and consistently rated (Yeates and Main, 2009; Arbuckle and Abetz-Webb, 2013; Matza et al., 2013).

Numerous disease-specific HRQoL measures have been developed for dogs and cats (Freeman et al., 2005; Yazbek and Fantoni,

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E-mail address: sophi.tatlock@adelphivalues.com (S. Tatlock).¹ Food and Drug Administration, 2009. Guidance for Industry: Patient-reported Outcome Measures: Use in Medical Product Development to Support Labeling Claims. <http://www.fda.gov/downloads/Drugs/.../Guidances/UCM193282.pdf> (accessed 4 December 2015).

2005; Brown et al., 2007; Budke et al., 2008; Hielm-Bjorkman et al., 2009; Favrot et al., 2010; Niessen et al., 2010; Lynch et al., 2011; Noli et al., 2011; Iliopoulou et al., 2013; Lavan, 2013; Belshaw et al., 2015; Bijsmans et al., 2015); however, there is a paucity of HRQoL measures for the broad feline population (Bijsmans et al., 2015; Freeman et al., 2016). This paper describes the development and psychometric evaluation of an owner-completed measure to assess feline QoL in veterinary clinical practice.

Materials and methods

Fig. 1 provides a methodological overview of the development and validation of a feline QoL measure, including an online survey, qualitative interviews with pet owners and a quantitative observational study.

Conduct of online survey

Items were drafted following conduct of an online survey with pet owners ($n=45$) identified through veterinary networks, most of whom (75.6%) were Zoetis employees/consultants. Pet owners were asked which feline behaviours indicated healthy behaviours. Concepts most frequently reported by pet owners informed the development of a 23-item draft measure.

Development of draft 23-item feline quality of life instrument

The draft 23-item measure assessed 15 hypothesised domains: 'interest/interaction with surroundings' (4 items), 'interaction with humans', 'gastrointestinal signs', 'physical activity level', 'vocalisation', 'appetite' (2 items, respectively), 'sleeping behaviour', 'pain', 'general health', 'appearance', 'toilet habits', 'hydration', 'weight loss', 'grooming' and 'general happiness' (1 item, respectively; Fig. 2). Pet owners rated their cat's behaviour in the past 4 weeks using a five-point Likert scale. A 4 week recall period was selected, since feline behaviour was expected to be stable (Bijsmans et al., 2015), and the measure was developed to potentially track health over time (i.e. months and years). Most items were rated from 'not at all' to 'a great deal'. Responses for the overall health question ranged from 'poor' to 'excellent' and the

grooming question ranged from 'strongly disagree' to 'strongly agree'. Questions about 'appetite', 'weight loss', 'sleeping' and 'movement' were assessed on a scale from 'not at all' to 'very much'.

Qualitative assessment of the draft feline quality of life measure: Concept elicitation and cognitive debriefing interviews

The 23-item draft measure was assessed in semi-structured qualitative telephone interviews with pet owners of healthy cats ($n=10$). Sample size was chosen to maximise conceptual saturation while ensuring study feasibility and a diverse sample by feline age and breed; samples of 12 can typically achieve conceptual saturation (defined as the point at which no new concepts emerge) (Guest et al., 2006). In this instance, the sample of 10, combined with the survey of 45 pet owners, was judged likely to be sufficient to achieve saturation. A new pet owner sample was identified through veterinary networks and recruited voluntarily for the interviews. To be included, cats were defined as healthy by their owners, indicating that the cat had no pre-existing health conditions.

Interviews were semi-structured, starting with open-ended questioning to collect qualitative data on healthy feline behaviours (concept elicitation), followed by presentation of the draft questionnaire and questioning to assess item relevance and understanding (cognitive debriefing) (Patrick et al., 2007; Lasch et al., 2010). In concept elicitation, pet owners firstly described their cat's daily behaviours using open ended questions, followed by direct questioning if any behaviour identified from the online survey was not spontaneously mentioned. Next, the draft measure was cognitively debriefed using a 'think aloud' exercise with pet owners to assess understanding and relevance. Pet owners read each instruction, item and response option out-loud, while sharing their interpretation of wording and rationale for selecting each response. Pet owners also commented on potential improvements to the measure.

All interviews were audio-recorded and transcribed verbatim. Using a computer-assisted qualitative data analysis software (Atlas.Ti, Atlas.Ti Scientific Software Development), interview

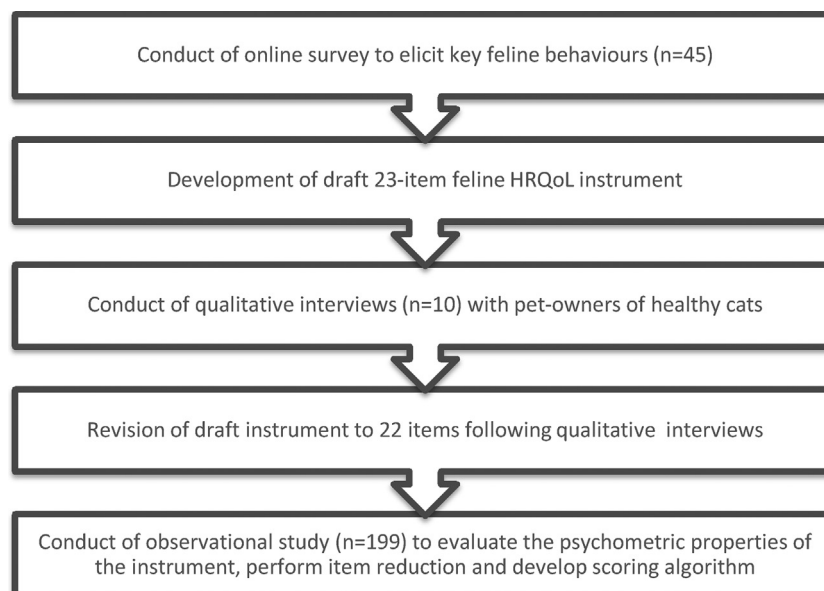


Fig. 1. Overview of methodology for online survey, qualitative interviews and quantitative observational study.

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