

# Parent reported outcomes of infant chiropractic care in a teaching clinic and private practices utilizing the United Kingdom Infant Questionnaire (UKIQ): A survey

By Hazel Mellars, MSc, Jasper Durville, MSc, Rogier Koel, MSc, Agnes Laan, MSc, Kristoffer Sandhauge, MSc and Joyce Miller, DC, PhD

## Authors:

Hazel Mellars, MSc, Private animal chiropractic practice, Dorset, UK  
Jasper Durville, MSc, Balgrist University Hospital, Zurich, Switzerland  
Rogier Koel, MSc, Private practice, Groningen and Borger Netherlands  
Agnes Laan, MSc, Private practice, Velp, Netherlands  
Kristoffer Sandhauge, MSc, private practice, Oslo, Norway  
Corresponding author: Joyce Miller, DC, PhD  
contact: jmiller@aecc.ac.uk; usajoycemiller@gmail.com

## ABSTRACT

**Objective:** There have been few investigations into parent report of outcomes for chiropractic care for infants. The goal of this survey was to implement an infant outcomes instrument in a teaching clinic along with private chiropractic practices to observe the demographic profile of patients and any unique observations in outcomes. **Method:** Infants aged up to 12 months presenting to the AECC University College (AECC) teaching clinic and to private chiropractic practices in the UK were eligible for inclusion. Mothers completed valid and reliable questionnaires which measured characteristics before and after chiropractic care. **Results:** A total of 479 infants from the AECC were included, and 19 from private clinics. Of these, 297 (61%) completed follow up forms at the teaching clinic and 15 (79%) completed follow up forms in the private clinics. The most common complaint for patients presented to the teaching clinic was a feeding problem (40%) compared to private clinics where the main complaint was a difficult birth (27%). The AECC had a mean satisfaction score of 9.5/10 (10 being completely satisfied) and the private clinics had a mean satisfaction score of 8.3/10. Scores of Parent Global Impression of Change (PGIC) showed that at least 86% of infants improved. There were no adverse events. **Conclusion:** Overall the parents in this study reported high satisfaction with the care their infant received, along with improvement in their infant's complaints. However, there were insufficient numbers from private clinics to make any representative conclusions about similarities or differences between a teaching clinic and private chiropractic clinics. Implementation of a parent report of outcomes in infant practice was feasible.

**Key words:** PROMs (patient reported outcome measures), infants, chiropractic, outcomes instrument

## Introduction

Infants use more health care than any other age group.<sup>1</sup> Symptoms such as excessive crying, feeding or sleeping account for approximately 47% of problems at clinical presentation in the first five months of life.<sup>1</sup> Parents access chiropractors regularly for these issues and the use of complementary and alternative medicine (CAM) continues to rise across the globe and millions of treatments are delivered annually.<sup>2</sup> Nevertheless, research is scant for such care, and often questioned.<sup>3</sup> Although medical referrals for chiropractic care are high,<sup>4</sup> satisfaction with chiropractic care for children has rarely been studied.<sup>5</sup> Patient satisfaction has become widely used in order to gain a better understanding of treatment quality in all types of clinical practice and its importance has been recognized by several authors.<sup>6</sup> Also, there are few prospective studies concerning adverse events

in chiropractic treatment for infants, although chiropractic care for children is generally considered safe.<sup>7,8,9</sup>

It is a public expectation that all practitioners deliver evidence based care of high quality and this should be available profession-wide. In other words, regardless of specific techniques used by practitioners to treat their pediatric patients, treatment outcomes should be reproducible across the profession. Research may have revealed a growing interest for CAM therapy and growing evidence of patient satisfaction but has yet to prove if the outcomes are equivalent across practices. It is natural for a patient to expect the same results from therapists practicing the same discipline. Is the chiropractic profession able to deliver treatments interchangeably and achieve an equal

standard of care? Variations between clinics and even therapists in the same clinic can be significant.<sup>2</sup>

In order to address the general lack of research in chiropractic care for infants, a research protocol was designed to implement a parent reported outcomes measure (PROM) into routine chiropractic clinical practice in a teaching clinic along with private clinics during a thirteen week time period.

## Methods

This was an observational study using a Parent Reported Outcomes Measurement (PROM), the United Kingdom Infant Questionnaire (UKIQ), a reliable, valid instrument for the infant patient.<sup>10</sup> Since PROMs have become more important in measuring healthcare quality than outcomes such as physiological reports,<sup>11</sup> but have seldom been used for infant care, it was decided to implement this in practice. The aim of this project was to test the practicality of usage of an infant PROM in chiropractic clinical practice, both in a teaching clinic and in private practice. It was decided to test for feasibility of incorporation into practice and to look for any variability in presentations or outcomes between a teaching clinic and private clinics (Box 1).

### The research questions:

1. Is a parent reported outcomes instrument feasible to implement in chiropractic clinical practice?
2. Is there a different demographic profile (age, gender, type of birth, complaint) in infants attending a chiropractic teaching clinic vs a chiropractic private clinic?
3. In infant patients who attend a chiropractic clinic, is there a difference in outcomes (by parent report) at baseline/intake versus follow-up in a teaching vs private clinic?

Box 1. The research questions.

In order to answer the research questions, private chiropractic practices were recruited through a pediatric conference, asking for volunteers. Only those clinics in the UK that expressed an interest were invited to participate in the study, and 15 volunteers were contacted via email. Those that replied were sent hard-copies of the United Kingdom Infant Questionnaire (UKIQ) intake and follow-up forms, plus an accompanying letter with instructions in order to implement the questionnaires in a consistent manner. The questionnaire was also introduced into the AECC University College (AECC) teaching clinic, where receptionists were asked to distribute the UKIQ together with the other routine forms on the first patient visit. The student interns were then instructed to hand completed questionnaires in to the research supervisor. Private clinics were given self-addressed envelopes to return the surveys at the end of the test trial. They were given contact

information if there were any questions or a need for more forms.

Mothers were asked to complete the 12-question instrument at initial presentation at either the teaching chiropractic clinic, or a private chiropractic clinic. Then a 13-question questionnaire was completed at the 4th treatment visit/follow up, or at the time of discharge from care, whichever occurred first. The first twelve questions were identical at presentation and follow-up. The thirteenth question was the Parent's Global Impression of Change (PGIC), a gold standard reference used to document change over treatment time.<sup>12</sup> Collection of demographic data included: age, gender, type of birth, place of birth, feeding type, infant complaint, medications taken, sleeping preferences, any recommendation for chiropractic care and which healthcare providers had previously seen the infant for the current complaint.

Inclusion criteria were: English-speaking mothers who presented their infant to a chiropractic office and that the age of the infant was up to 12 months of age. The exclusion criteria were: parents who could not speak English, child over the age of 12 months, or those who did not wish to participate. Parents signed a consent form to be included in research before being asked to complete the questionnaire.

Completed questionnaires from the AECC University College teaching clinic were stored in a locked cupboard within a locked room to preserve safety and confidentiality. A reminder email was sent to the private chiropractic participants to encourage them to continue using the questionnaires for as long as possible, and a final reminder was sent with a set deadline date of return. Questionnaires from the private chiropractic clinics were returned via the postal service in batches and stored in the same secure area.

Feasibility of implementation was tested by number of clinics that enrolled in the study and the number of intake and follow-up forms returned in the time period. The other research questions were tested by results of the intake and follow-up forms collected in the AECC clinic and those returned by mail from the private clinics.

After both the intake and follow-up questionnaire were collected, the data were entered into Microsoft Excel®. A data key was developed relating to the Excel spreadsheet, so it was clear which column referred to which question in the questionnaire. From Excel, descriptive statistical analysis was completed to calculate percentages and means of demographic variables. For comparisons of outcomes between the private clinics and the AECC teaching clinic, descriptive statistics were used to analyze the data. The AECC Director of Research assisted the team in data analysis, using SPSS V. 21®.

The study was approved by the AECC Research Ethics Sub-Committee. All data were completely confidential. There was no way to identify any specific patient from any of the data collected in the forms. Only the members of the research team were able to access the questionnaires as they were stored in a locked room, which was only accessible by authorized people, all in line with the Data Protection Act (1998).

## Results

Six private clinics provided 19 questionnaires, an average of 3.2 per clinic whereas the teaching clinic provided 479. There were 297 follow up questionnaires (60.6%) from the AECC teaching clinic and 15 from the private clinics (78.9%). Even though the number of responses was low from private clinics, and thus may not warrant further analysis, the results are depicted in tables in order to learn as much as possible from the data. Table 1 shows the characteristics of the child on presentation to the clinics. Tables 2 and 3 show intake and exit scores for the two types of clinics. Table 4 shows global impression of change and Table 5 shows side effects. Tables on following pages.

There were 1,004 complaints for 474 infants at the AECC (on average 2.1 complaints per infant). Private practices had 32 complaints for 18 infants (on average 1.8 complaints per infant).

In general, patients in the private clinics were slightly older, sicker, had more medically assisted births and had seen more medical clinicians prior to presentation at the chiropractor. At least 86% of the parents reported improved symptoms in the baby and were highly satisfied. There were no adverse events and side effects were mild.

## Discussion

The purpose of this research was to test the feasibility of implementation of an infant outcomes instrument in chiropractic practice, in a teaching clinic and in private clinics. The second purpose was to collect the profile of infants who are presented to chiropractors and what the parents report regarding their care outcomes. These goals were essentially met. However, the response rate from private clinics was too low to form representative samples for statistical comparison. However, the over-all number of infant data collected was approximately 500, so the parent report of outcomes may be representational of infant patients that are presented to chiropractors.

It is important for all clinicians to evaluate the outcomes in the patients that they serve. Outcome measures have been used in chiropractic care for many years and are considered an important part of modern practice.<sup>12</sup> However, the purpose of this study was primarily to determine feasibility of using a wide variety of practitioners to complete parent reports.

If data collection of outcomes could be found feasible in a spectrum of clinics, this could become a key part of patient-centred care for infants, as has been shown for adults.<sup>13</sup> The underlying theory of this application is that regular, ongoing feedback from patient reported outcome measures (PROMs) to clinicians will enable both practitioners and patients to reflect on whether the treatment provided is working,<sup>14</sup> a key part of patient-centred care.

The private clinics provided far fewer questionnaires than the teaching clinic. However, the private clinics provided a higher follow-up rate than the teaching clinic, possibly indicating that invested clinicians monitor the patient's follow-up more closely than interns, or possibly that private clinics offer shorter episodes of treatment. Nevertheless, research participation is essential in the endeavor to answer important research questions. Is there a gap between clinical practice and clinical research? It would seem that the challenge with clinician's participation in clinical research is not isolated to research carried out by the chiropractic profession. Medical research has found that there are barriers to practice research in the Western medical model. For example, in a study of barriers to practice research, 37% of German General Practitioners (GPs) responded, similar to the response rate in this study of 40%. While nearly all GP respondents considered the research important, over half (56%) would not participate in future research projects.<sup>15</sup> Some of the barriers were time constraints, lack of staff and training, worry about the impact on doctor-patient relationship, concern for patients, lack of rewards and recognition.<sup>16</sup> Some clinicians may feel overwhelmed by research requests.<sup>17</sup> Further, additional work may be challenging to take on in today's healthcare environment; something that may be especially true for non-researchers.<sup>18</sup> Even with a great respect for research, time constraints can hinder clinicians in reading and implementing research,<sup>19</sup> let alone participating in it.

Researchers must take full responsibility for the failure of private practice clinicians to participate. Motivation driven by the research group has been recognized as more important when recruiting than financial incentives, the research topic, or research experience.<sup>20</sup> Attention should be paid to factors that may promote participation in future research projects. By seeking clinicians supportive of research, giving clear instructions, establishing expectations (including amount of time required), and maintaining frequent contact combined with several reminders, might have lead to higher participation. Ensuring clinicians have a better understanding of how the information provided will be put to use, could promote participation.<sup>21</sup> The time frame may have been too short for the practitioners to establish a research rhythm in their practices. More time could have improved the responses in this study.

DEMOGRAPHIC PROFILE	TEACHING CLINIC (n=479)	PRIVATE CLINIC (N=19)
Mean Age	7.2 weeks	10.9 weeks
Mode (most common age)	3 weeks	8 weeks
Age Range	0-47 weeks	1-45 weeks
Gender	56% Male	74% Male
Mean maternal age	32 years	36 years
Maternal age range	17-47	30-49
<b>Referral</b>		
from any health care Practitioner	73.5%	23.5%
Friends & family	25.4%	76.5%
<b>Per cent assisted birth</b>	65%	84%
<b>How baby fed</b>		
Breast fed	53.6%	68.4%
Formula fed	26.5%	26.3%
Both	19.9%	5.3%
Presenting complaints	N; %	N: %
Crying	147; 31%	5; 26%
Feeding	188; 39.7%	3; 16%
Sleeping	116; 24.5%	3; 16%
Uncomfortable supine	153; 32.3%	4; 21%
Unable to turn head both sides	36; 8%	5; 26%
Difficult birth	127; 27%	6; 32%
Head shape	72; 15%	0; 0%
Check-up	132; 28%	3; 16%
Tongue-tie	3; 0.6%	1; 5%
Other MSK	18; 4%	1; 5%
Reflux	4; 0.8%	1; 5%
Wind	7; 1.5%	0; 0%
Weight	1; 0.2%	0; 0%
<b>Preferred Sleep Position(s)</b>		
Back	270; 57%	13; 68%
Front	94; 19.8%	5; 26%
Right	100; 21.1%	3; 16%
Left	83; 17.5%	5; 26%
Upright	23; 7.6%	1; 5%
On parent's chest	4; 0.8%	0; 0%
<b>Medications given</b>	62%	58%
Mean number medications per child	2	2.5
Largest number of medications per child	7	6
<b>Other clinicians seen for same condition</b>	Teaching Clinic	Private Clinic
GP	69; 21.9%	9; 47.4%
Paediatrician	17; 5.4%	2; 10.5%
Consultant	9; 2.9%	0; 0%
Midwife	113; 35.9%	2; 10.5%
Hospital	18; 5.7%	3; 15.8%
Lactation consultant	49; 15.6%	2; 10.5%
Chiropractor	21; 6.7%	5; 26.3%
Physiotherapist	4; 1.3%	0; 0%
Osteopath	6; 1.9%	1; 5.3%
Health visitor	65; 20.6%	2; 10.5%
Tongue tie specialist	9; 2.9%	0; 0%
Homeopath	0; 0%	1; 5.3%
Dietician	0; 0%	1; 5.3%

Table 1. Demographic profile of infants presented to chiropractic clinics, n=498. Key: Mothers could select more than one presenting complaint and sleep position.

AECC	Intake N; mean score	Follow up N; mean score (%change)
Feeding	455; 3.5	283; 1.2 (66%)
Sleeping	475; 3.8	283; 1.6 (58%)
Crying	457; 3.7	282; 1.4 (62%)
Crying time	456; 3.5	283; 1.5 (57%)
Consolability	474; 3.8	283; 1.6 (58%)
Supine	456; 4.3	283; 1.5 (65%)
Pain	466; 4.2	282; 1.6 (62%)
Maternal Depression	456; 2.3	282; 0.7 (70%)
Quality of life	453; 2.7	281; 1 (63%)
Head turning to both sides	450; 3.5	281; 1.4 (60%)
Tummy time	470; 4.9	281; 6.5 (33%)
Satisfaction	N/A	97; 9.5

Table 2: Mean change in scores (0-10) of complaints at the AECC teaching clinic.

Private	Intake N; mean score	Follow up N; mean score (%change)
Feeding	18; 2.4	14; 2.4 (0%)
Sleeping	18; 3.3	14; 2.6 (21%)
Crying	18; 3.7	14; 2.4 (35%)
Crying time	18; 3.3	14; 2.0 (39%)
Consolability	18; 3.8	14; 2.9 (24%)
Supine	18; 4.2	13; 3.0 (29%)
Pain	18; 4.1	14; 1.9 (54%)
Maternal Depression	19; 1.9	14; 1.2 (37%)
Quality of life	19; 2.4	14; 2.1 (13%)
Head turning to both sides	19; 5	14; 2.8 (44%)
Tummy time	18; 2.7	14; 3.6 (33%)
Satisfaction	N/A	14; 8.3

Table 3: Mean change in scores (0-10) in the intake) and follow up questionnaires at the private clinics (N=19).

	AECC (N=274)	Private (N=14)
1. Worsened	2; 0.7%	1; 7.1%
2. No change	5; 1.8%	1; 7.1%
3. A little better	9; 3.3%	2; 14.4%
4. Moderately better	17; 6.2%	3; 21.4%
5. Better and a definite improvement	156; 57%	6; 42.9%
6. Completely better, like a different baby	85; 31%	1; 7.1%

Table 4: Parent Global Impression of Change (PGIC) scores at the AECC teaching clinic (N=274) and at the private clinics (N=14).

	AECC (N=171)	Private (N=13)
Adverse event	0	0
Side effects	8; 4.7%	4; 30.8%
No side effects	163; 95.3%	9; 69.2%
1	Slightly more unsettled after treatment	Bit more fractious after treatment
2	Not described by parent	Little fussy after treatment, however, hard to tell as medi- cation had increased as well
3	Crying a little more	Increased crying in evenings and during treatment
4	Grumpy, irritable in the evening of treatment	In last few days she has rejected the bottle, gets very distressed
5	Sometimes a bit more agitated on the same day of treatment	
6	Grumpy following day	
7	Small amount of crying, settled quickly	
8	Sleeps better	

Table 5: Number of adverse events and side effects recorded at the AECC teaching clinic and at the private clinics, including the reported side effects.clinics (N=14).

It is impossible to place any emphasis on the private care results when using such low numbers (n) as low numbers when averaged, tend to skew the means. However, in general, the differences between the teaching clinic and private clinics were small. Satisfaction rates of care were very high in both types of clinics. Likewise, more than 85% of parents reported improvement in their child's condition in both types of clinics. Satisfaction rates are generally linked to improvement.<sup>5</sup>

Whether there was a difference in actual practice between the clinics is unknown. Across professions, services tend to be delivered somewhat differently between providers. In manual therapy, a uniform and identical approach to musculoskeletal complaints is unlikely. There are variations in patient demographics, including presenting complaints and diagnosis prevalence that may lead to some clinicians



being more experienced with certain presenting complaints and required therapy.<sup>22</sup> Pohlman and her colleagues also reported several demographic differences between chiropractors offering chiropractic pediatric treatment.<sup>23</sup> Factors such as amount of time spent in direct patient care, treatment techniques, employment of chiropractic assistants, weekly work hours, number of patients, age, and degrees held all may be implicated in the types of care on offer. Furthermore, the teaching clinic offers a specialist interdisciplinary breastfeeding clinic which might serve to attract those types of cases, possibly explaining why the presentation of babies with suboptimal breastfeeding was so high.

Assisted birth presentations were over-represented in both clinics. At the AECC, 65% had assisted births, compared to the private clinics with 84%. In the UK, 59% babies studied had a normal vaginal birth in NHS hospitals.<sup>24</sup> The population presenting to these clinics have approximately double the rate of assistance than the average baby in the UK. It was therefore reasonable that birth trauma was such a common complaint, the most common complaint in the private clinics. Parents (and clinicians as there were many medical referrals to both clinics) seemed to recognize that when there has been a strain or physical stress on the baby, that musculoskeletal type of care, such as chiropractic care, might be helpful. There were more medical referrals to the teaching clinic, probably because it is known in the community. Virtually all of the infants had visited one or more types of medical practitioners before presentation at the chiropractic clinics, indicating shared care was the norm.

As a consequence of their medical treatment, both clinics saw about a third of infants using two or more types of medication. One baby presented had used seven medications. There is wide concern in medicine about the over-use of off-label prescriptions in the pediatric population, considering the lack of evidence for safety and efficacy required by regulatory standards.<sup>25</sup> It is important that all clinicians observe the patient for possible side effects of medications.<sup>26</sup> According to the World Health Organization, over the counter medicines are also readily accessible, but their use for children is generally not evidence-based and often inappropriate.<sup>27</sup>

Adverse events in chiropractic care for children are rare.<sup>7,8,28</sup> In this research, no adverse events were reported. There were, however, mild side effects such as increased crying for less than a day and better and more sleep. Chiropractic treatment appears to cause fewer side effects when delivered by qualified chiropractors than by students.<sup>8</sup> However, the opposite was found in this study. At the AECC, 5% of infants reported a side effect, compared to

31% at the private practice clinics, which could be due to the differing age group or level of birth trauma, or else an artifact of the small numbers. It is known that about a third of adults experience mild side effects with chiropractic care. It will be interesting to determine with larger samples whether this occurs with infants as well.

One of the main objectives for current chiropractic research is to document any benefits for public health for our patients. A key public health issue for infants is Back-to-Sleep.<sup>29</sup> Despite the importance of supine sleep, just under half of AECC-treated infants and about a third in the private clinics did not sleep supine, and commonly presented for this concern. This is important because the "Back to Sleep" campaign, which educates parents that their infants should sleep supine, has been successful by decreasing mortality from sudden infant death syndrome (SIDS) by more than half.<sup>30</sup> According to Public Health England (2015), it is a leading cause of infant mortality, and current advice for safer sleeping is to have the infant sleep supine.<sup>29</sup>

Infants may not sleep supine due to discomfort in their musculoskeletal system<sup>31</sup> along with their inability to turn their head both ways. These issues are key areas for chiropractic treatment to be beneficial in the support of public health. There were excellent improvements in supine sleep, complaints of infant pain, ability to rotate the head in both directions and crying time and consolability along with breastfeeding in this study, all key elements in public health support for infants.

### Limitations

The low return of surveys in private practices was likely due to lack of research experience and time constraints and poor support. Hence, the results from the private clinics may not be applicable to the wider population. There are many impediments to implementation of outcome instruments in private practice and researchers can assist in resolution of those issues. There were no reported problems with the instruments implemented in this study.

### Conclusion

In this study of outcomes of chiropractic care for infants presented to a teaching clinic and to private clinics showed very high satisfaction ratings from the parents along with good improvements in the infants' complaints with no adverse events. The UKIQ is a promising tool for measuring outcomes in a conservative practice. Because private practices participated at a low level, further efforts should be made, including better training, more time and electronic questionnaires to encourage higher response rates. Measuring outcomes is a key component of patient centered care. In this study, parents reported that chiropractic care was both safe and effective for their infant.

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