

Chapter 4

**Introducing video recording in primary care midwifery for research
purposes: procedure, dataset, and use**

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ABSTRACT

Background Video recording studies have been found to be complex, however very few studies describe the actual introduction and enrolment of the study, the resulting dataset and its interpretation. In this paper we describe the introduction and the use of video recordings of health care provider (HCP)-client interactions in primary care midwifery for research purposes. We also report on the process of data management, data coding and the resulting data set.

Methods We describe our experience in undertaking a study using video recording to assess the interaction of the midwife and her client in the first prenatal consultation, in a real life clinical practice setting in the Netherlands. Midwives from six practices across the Netherlands were recruited to videotape 15-20 intakes. The introduction, complexity of the study and intrusiveness of the study were discussed within the research group. The number of valid recordings and missing recordings were measured; reasons not to participate, non-response analyses, and the inter-rater reliability of the coded videotapes were assessed. Video recordings were supplemented by questionnaires for midwives and clients. The Roter Interaction Analysis System (RIAS) was used for coding as well as an obstetric topics scale.

Results At the introduction of the study, more initial hesitation in cooperation was found among the midwives than among their clients. The intrusive nature of the recording on the interaction was perceived to be minimal. The complex nature of the study affected recruitment and data collection. Combining the dataset with the questionnaires and medical records proved to be a challenge.

The final dataset included videotapes of 20 midwives (7-23 recordings per midwife). Of the 460 eligible clients, 324 gave informed consent. The study resulted in a significant dataset of first prenatal consultations involving recording 269 clients and 194 partners.

Conclusion Video recording of midwife-client interaction was both feasible and challenging and resulted in a unique dataset of recordings of midwife-client interaction. Video recording studies will benefit from a tight design, and vigilant monitoring during the data collection to ensure effective data collection. We provide suggestions to promote successful introduction of video recording for research purposes.

BACKGROUND

Video recording of health care-provider (HCP)-client communication has become an accepted part of health care education and research. In education, video recording provides feedback on work habits by assessing communication during clinical performance. In research, video recording enables the assessment of communication performance or intervention fidelity as well as the confirmation of best practices in health care provider-client communication by observing daily practice, often in combination with other research measures such as questionnaires [1,2,3].

In the Netherlands, nearly 80% of all pregnant women start obstetric care in a midwifery practice [4]. In the first prenatal consultation, the midwife provides health education on a large number of important topics, e.g. on health life style such as smoking, drinking, weight gain, and on infectious diseases. In 2007, midwives became the primary counselors for prenatal screening for congenital anomalies [4]. To date, no research has considered how midwives counsel clients in practice, how they provide health care education during a consultation, or what topics are addressed during the first consultation. We felt video recorded HCP-client interaction in midwifery practices would be an ideal approach to studying these complex interactions.

We anticipated that the use of video recordings for research purposes in health care practice would be complex; however, very few studies describe the actual introduction and enrolment of the study, the resulting dataset and its interpretation. From a number of studies on video recording we extracted three elements that seem to shape the feasibility of a video recording study: introduction of the study, complexity of the data collection and intrusion of the video camera. A good *introduction* is crucial to the feasibility of the study. Both client and health care worker need to be briefed adequately in order to enhance participation [2]. *Complexity* of the data collection refers to additional questionnaires that need to be completed, filling in of forms such as non-participant forms, and managing the actual recording. It has been found that a more complex research protocol results in reduced participation [2].

A third element to consider is the potential *intrusive nature* of the camera for both the health care worker and the patient. The actual recording could act as an intervention. However, there is little evidence that care providers behave differently when on camera [5] and in practice, the majority of patients do not object to being video recorded, as long as there are careful privacy and safety procedures [2,6,7].

We found little information in the literature on the construction of a meaningful data set in terms of *quantity*: e.g. about how many recordings should be made in total and per health professional, how many health professionals should be included to allow for generalizability of the observations. It is our impression that the challenges encountered with the complex and time-consuming nature of video recording may in the end determine the amount of data collected rather than realising a predefined number of recordings.

In this report, we use a framework made of the elements extracted from the literature: introduction, complexity and intrusion, to which we have added *quantity* as a fourth important element to consider in planning and implementing video recording studies. This is the first study in which midwife-client interactions in primary care midwifery practices in the Netherlands were video recorded. The purpose of the study was to gain insight into the midwife-client interaction in relation to the quality of care provided by midwives. There are very few papers recounting the complex recording process. This paper describes the introduction of video recording in midwifery practices for research purposes, the coding process, and the resulting dataset. Analyses of observational data are described in separate papers [8,9].

METHODS

The video study focused on the interaction of the midwife and her client in the first prenatal consultation. The study was embedded in the DELIVER study, a large scale multi-centre multidisciplinary prospective national survey into the quality and provision of primary midwife led care in the Netherlands in which twenty midwifery practices and their clients participated [10-12]. The design of the DELIVER study, including the video recordings of first prenatal consultations, was approved by the Institutional Review Board of the VU University Medical Centre as well as by the Medical Ethical Committee of the VU Medical Centre, Amsterdam, the Netherlands, supplemented by consent from all participating midwives.

Data collection: quantity of video recordings

In order to have an adequate sample to perform quantitative analysis and to develop consistency around our observations of communication for each midwife and across the group, we aimed to obtain at least 15-20 recordings per midwife and to include at least 6 practices across the country. The number of recordings was also based on the fact the sometimes the first recording needs to be discarded due to getting acquainted with video recording [13] and sometimes technical problems are encountered rendering the recording unusable. At recruitment for the DELIVER study, all twenty DELIVER practices, which were purposively sampled from the north, east, west, and south region of the Netherlands were automatically asked to participate in the video recording study, even though we anticipated that would be more than sufficient for our video data collection. All midwives in a practice were requested to participate; however in larger practices the number was set at a maximum of 6 midwives, to limit the relative influence of one practice on the entire dataset. In all participating practices, midwives decided which of them participated.

Midwives were eligible to participate if they: (1) had a work contract at the midwifery practice; (2) were fully qualified midwives (e.g. not student-midwives); and (3) if prenatal counseling consultations were part of their usual work.

Clients were eligible if they: (1) were new to counseling about prenatal congenital anomaly tests for the current pregnancy; (2) waived their right not to know about prenatal anomalies tests; (3) were aged 18 years or older; and (4) were able to read Dutch or English.

Data collection was carried out between June 2010 and May 2011.

Data management

All video recordings were digitalized, analyzed in The Observer XT version 7.0 [14]. Coded data were transported to the statistical software package SPSS 20.0 (SPSS inc., Chicago, IL). Data from the analysis of the video recordings were entered in SPSS 20.0 together with the questionnaire data. Through anonymous patient numbers, data from the video recordings were connected to the questionnaire data and the medical record files of the DELIVER study.

Introduction of video recording research

Practices were first approached by phone, followed by written information to those who agreed to consider participation, and finally a visit was made to explain the study procedure. For the recording, participating midwives received a camera, empty tapes, and a recording protocol. They were made familiar with the actual recording of the consultation: setting up of the camera, starting and stopping recording, camera angle, changing of tapes, completion of the study forms, etc. Researchers were not present at the actual recordings but could be reached by phone.

Midwives also received questionnaires, information leaflets for clients and informed consent forms. Practice assistants who did the initial recruitment, received protocol instructions from the midwives.

Enrolment of clients

The enrolment procedure for this study is described as a flow chart in Figure 1. Pregnant women and their partners were recruited from all consecutive new clients at the six midwifery practices involved. Eligible clients received information about the study and were invited to participate. Interested clients signed an informed consent form prior to the consultation, which stated that they could withdraw at any time during or after the consultation without consequences.

If clients declined to participate in the study, the practice assistant recorded reasons for refusal of participation as well as the clients' age, parity, level of education and ethnicity.

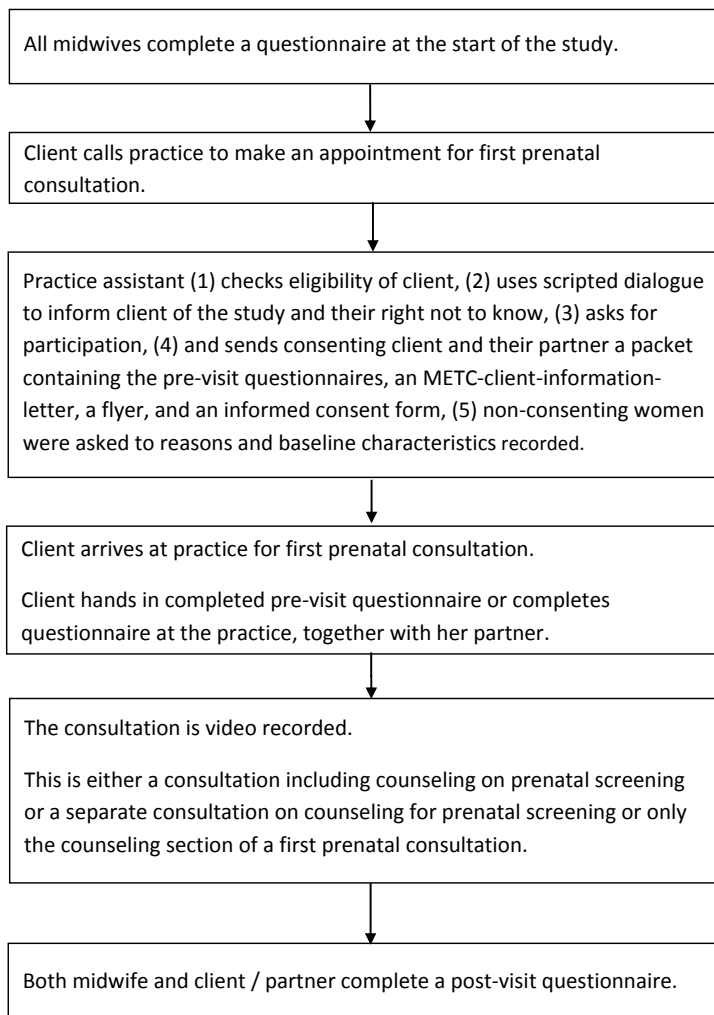


Figure 1 Flowchart for video recording study.

Questionnaires

To supplement the recordings, we collected demographic information and background characteristics from midwives, clients, and their partners. We asked participants to complete the QUOTE ^{prenatal} questionnaire twice, once before and once after the recorded consultation. This questionnaire focuses on clients’ preferences and experiences regarding prenatal counseling for congenital anomaly tests [15]. On request, an English version of the questionnaire was available.

The midwives completed the midwives’ version of the QUOTE ^{prenatal} including items on the midwife-client relationship once, at the start of the study to assess their views on appropriate

counseling for prenatal congenital anomaly tests [16]. To assess their reflections on daily practice, midwives completed the same questionnaire again at the end of each recorded consultation.

The video recording

The midwife positioned the unmanned camera to show her full face, in line with protocol instruction; the client and her partner were usually seen from behind or from the side. The recording was started before the client entered the consultation room. The midwife recorded the identification numbers of the practice, national registration of herself and the number of the client on video before the client entered. The midwife notified the client and her partner that the video had started recording. The tape was turned off at the end of the (counseling part of the) consultation.

Approach to analyses

Coding

Coding of the recordings

For the purpose of analysing the collected data, a valid and reliable coding scheme was used to quantify the data. The best known and most frequently used coding scheme for HCP-patient interaction during the patient visit is the Roter Interaction Analysis System (RIAS). RIAS is also the most extensive coding scheme available [17-19]. Coding was done in two separate runs for verbal and nonverbal behaviour, respectively.

In the coding for communication a distinction was made between point events and state events. Point events refer to a straightforward count of occurrences, e.g. does a midwife inform the client of her risk of having a child suffering from a congenital abnormality and if so, how often is the theme discussed. The occurrence is noted and therefore the frequencies can be counted. No time indication is given. State events refer to elements in the communication that are linked to a time indication, e.g. client-directed gaze or the duration of the prenatal counseling.

Coding of the recordings for verbal behaviour

The main focus of the coding was on *verbal behaviour* related to prenatal counseling for congenital anomaly tests. The RIAS is applied to the smallest unit of expression or statement to which a meaningful code can be assigned. These units are assigned to mutually exclusive and exhaustive categories that reflect the content and form of the dialogue. RIAS has demonstrated levels of reliability and concurrent validity [17,19].

Furthermore, for the purpose of the study, we developed an obstetric topics scale to code each topic addressed during the intake to allow for all relevant components of a first prenatal consultation to be addressed in the analyses, inclusive aspects of prenatal counseling for congenital anomaly tests. The main categories of this obstetric topic scale were: family history (including family genetics, consanguinity), obstetric history, pregnancy-related health and well-being, life style (smoking, alcohol, drugs, weight, nutrition), infectious diseases, use of medication, counseling and philosophy of life and physical examination. An open category was used to note remarkable occurrences such as “the video-recording could not be used because another consultation was recorded on top of it”.

Coding of the recordings for nonverbal behaviour

For *nonverbal behaviour*, the affect or emotional context of the dialogue, the Global Affect Measure (GAM), which is part of RIAS, and client-directed gaze were rated. The GAM ratings are based on overall affective impressions of the health care provider on such dimensions as dominance, friendliness, attentiveness, and hurrying or rushing. Impressions of the clients are based on dimensions such as emotional distress, assertiveness, and friendliness. Ratings of the GAM were assigned for both the midwife and client (and her partner) on scales from low to high (scale 1-6). Ratings of “3” or “4” are considered “average” affect (www.riasworks.com).

Client-directed gaze is the time the midwife looked directly into the pregnant woman or her partner’s face. Client-directed gaze has previously been found to facilitate a discussion about psychosocial issues [20] and is thus an important factor of communication.

Approach to establishing coding reliability

Before observing and coding the videotapes, three researchers and three research assistants participated in a RIAS course. These coders were split in two teams: one team with two researchers (JG, MP) and one research assistant (KvA) coded the content of the first prenatal consultation, GAM and client-directed gaze. The second team with one researcher (LM) and two research assistants (LG and VS) coded the communication of the prenatal counseling only, with a distinction between verbal and nonverbal behavior using the RIAS. At the start of the coding process, coders of each team compared three coded tapes, adjusted unclear items and made a final coding model. The team coding the content started the coding process, the other team followed. To establish inter-rater reliability, within each team, the coders compared in total approximately 10% of the tapes with each other, and continued to do so, on a regular basis using also a coding memo to exchange coding experiences, to check and maintain consensus. Coders used direct entry software, The Observer XT version 7.0-computer system, which is especially designed for coding behavioural interactions from video recordings [14], and coded directly from the digitized videotaped sessions.

Dataset

Descriptive statistics were used to report characteristics of the participating practice, the midwives, clients (and partner) and the first prenatal consultation recordings. The participating and non-responding clients were compared using t-tests to examine differences in age and chi square tests to examine differences in parity, level of education and ethnicity. Proportions were used to identify the relative contribution of the practices and midwives to the total dataset.

RESULTS

Introduction: feasibility of the study

Six of the twenty practices that participated in the DELIVER-study were asked to participate. They were selected on the basis of regional coverage, size of the practice and the client characteristics within the different areas. When two declined, two other DELIVER practices in the same region were approached, and they agreed to participate.

Per practice two to six midwives agreed to be recorded, in two practices one or more midwives refused to participate. In the six practices, recordings were made of 22 midwives and unintentionally of two non-midwife ultrasound specialists who provided prenatal counseling. The recordings from the ultrasound specialists were excluded from the data because the focus was on midwives. Correctly recorded videotapes per midwife ranged from 2 to 24. If less than seven complete recordings were made of an individual midwife, the recordings of this midwife were excluded. In the research team it was decided that this number was considered too low to give a valid impression of the midwife's client communication skills. The increased awareness of being recorded may have prompted a tendency towards 'best behaviour' for midwives or may have increased self-consciousness. This could have affected the first recording when adjustment takes place. However, we found no discernible learning curve with regards to the content and the amount of information given in the first recorded video consultation were compared to all other recorded video consultations. First recordings were therefore not discarded [9].

Dataset

Quantity

An overview of the data collection is given in Table 1. The table shows that video recordings from 20 midwives were taken into the analyses. The number of midwives per practice ranged from one to five midwives, and recordings ranged from 7 to 23 per midwife.

Table 1 Data collection: practices, midwives and recordings.

Practice code	Midwife code	Recordings/clients per midwife	% Recordings per practice	% Recordings per midwife
1	1	20		7.4
	2	19		7.1
	3	19		7.1
	4	15		5.6
Subtotal		73	27.1	
2	5	14		5.2
	6	12		4.5
Subtotal		26	9.7	
3	7	14		5.2
	8	16		6.0
	9	12		4.5
	10	11		4.1
Subtotal		50	18.6	
4	11	12		4.5
	12	11		4.1
	13	16		6.0
	14	23		8.6
Subtotal		62	23.1	
5	15	9		3.3
	16	11		4.1
	17	8		3.0
	18	11		4.1
	19	12		4.5
Subtotal		51	19.0	
6	20	7	2.6	2.6
N=6	N=20	N=269		

Of the 460 eligible clients (pregnant women approached to participate), 324 (70.4%) agreed, resulting in the same number of video recordings, since each client was recorded once. Of 269 (58.5% of all approached clients), the video recording could be used for analyses and were included in the resulting dataset. A flow chart summarizing the number of clients approached, down to the final number of recordings included in the dataset, including description of the reduction of numbers can be found in Table 2.

Three types of recordings were made: a whole routine first prenatal consultation including counseling ($N=191$), a recording limited to the counseling part of the consultation ($N=71$), and a separate counseling consultation ($N=7$).

Table 2 Inclusion and exclusion of clients and recordings.

460	Eligible clients
- 136	Did not agree to participate for various reasons
324	Agreed to participate, total number of recordings made
	<i>Exclusion grounds for recordings:</i>
- 19	Failed recordings
- 7	Recording stopped /halted
- 1	Partner withdrew from study for privacy reasons
- 2	No unique code
- 2	Unmatched second recording
- 1	Consultation of 38 weeks gestation
- 18	Recordings from ultrasound specialists
- 4	Too few recordings per midwife
269	Total number of recordings in final dataset

Adequacy and representativeness of sample

The sample characteristics are described on three levels: for the midwives, for the clients and for the recordings, respectively in Table 3, 4 and 5.

The mean age of the 20 participating *midwives* was 32.8 years (range 23 to 54 years), with a mean of years of work experience of 8.3 years (range: just started to 33 years). Demographic and professional characteristics of the midwives are shown in Table 3.

Data on background characteristics of *clients* are shown in Table 4. Data on background characteristics of clients were available for 89.6% ($N=241/269$) and data on background characteristics for partners were available for 88.1% ($N=171/194$). The mean age of the pregnant women was 29.2 years, (range 20 to 40 years) and the mean age of partners was 31.8 years (range 18 to 47 years).

Recordings were combined with questionnaires and with medical records. The latter was complicated and resulted in a large reduction in numbers of matched data; a match of 54 of 269 (20%).

Data on the *recordings* of the consultations are summarised in Table 5, which contains information on the number of recordings and on the duration of the different recordings.

Twelve tapes could not be coded on client-directed gaze because of the angle of the recording and for one tape only RIAS coding was done, due to administrative error of the coders, no other coding was undertaken. The intake consultations, including prenatal counseling ($N=191$), lasted on average 39.55 minutes and ranged from 11.08 minutes to 95.58 minutes. The counseling part of these consultations lasted on average 9.48 minutes and ranged from 1.92 minutes to 25.12 minutes.

Table 3 Demographic and professional characteristics of midwives and of the Dutch midwifery population^a.

Characteristics	Midwives N=20 (%)	The Dutch midwifery population N=2612(%)
Age (years)		
≤ 29 years	10 (50)	< 40 years = 1644 (63)
≥ 30 years	10 (50)	> 55 years = 198 (7.6)
Gender		
Male	-	43 (1.6)
Female	20 (100)	2569 (98.4)
Ethnicity^b		
Dutch	14 (70)	Not available
Non Dutch – Non Western ethnicity	2 (10)	
Non Dutch – Western ethnicity	4 (20)	
Place of graduation		
Amsterdam	8 (40)	641 (25)
Groningen	1 (5)	147 (6)
Maastricht	3 (15)	660 (25)
Rotterdam	3 (15)	638 (24)
Abroad	4 (20)	523 (20)
Missing	1 (5)	3 (0.1)
Year of graduation		
≤ 2003	9 (45)	Not available
≥ 2004	11 (55)	
Work experience (years)		
≤ 2 years	4 (20)	Not available
3 – 11 years	12 (60)	
≥ 12 years	4 (20)	
Religious background		
None believers	11 (55)	Not available
Believers	9 (45)	

^a [25].^b In the Netherlands, ethnic origin is defined by country of birth of a person's parents. If one of the parents (or both of them) of a person is born outside the Netherlands, this person is non-Dutch [26].

Table 4 Characteristics of pregnant women and (if available) their partners.

Characteristics	Pregnant women N=241* (%)	Partner N=170* (%)
Gender		
Male	-	168 (99.4)
Female	241 (100.0)	1 (0.6)
Age (years)		
≤ 25 years	44 (18.5)	21 (12.6)
26 – 30 years	108 (45.4)	45 (26.9)
31 – 35 years	73 (30.7)	69 (41.3)
≥ 36 years	13 (5.5)	32 (19.2)
Highest level of education		
Up to high school	115 (47.9)	88 (52.1)
Higher vocational education / university	125 (52.1)	81 (47.9)
Occupation		
School	12 (5.1)	4 (2.4)
Paid job	198 (84.6)	158 (94.0)
Unemployed	12 (5.1)	2 (1.2)
Disabled	1 (0.4)	3 (1.8)
Housewife / Husband	11 (4.7)	1 (0.6)
Marital status		
Single	11 (4.6)	4 (2.4)
Divorced	0 (0.0)	0 (0.0)
Married / Partner	227 (95.4)	164 (97.6)
Ethnicity^a		
Dutch	184 (77.0)	135 (80.8)
Non-Dutch	55 (23.0)	32 (19.2)
Religious background		
None	112 (47.1)	80 (47.9)
Christian	102 (42.9)	78 (46.7)
Muslim	22 (9.2)	7 (4.2)
Other	2 (0.8)	2 (1.2)
Pregnancy duration		
≤ 11 weeks	204 (92.3)	147 (94.2)
≥ 12 weeks	17 (7.7)	9 (5.8)
Parity		
Nullipara	98 (41.2)	92 (55.1)
Multipara	140 (58.8)	75 (44.9)

*Due to missing and inapplicable answers the N can vary from variable to variable.

^a In the Netherlands, ethnic origin is defined by country of birth of a person's parents. If one of the parents (of both of them) of a person is born outside the Netherlands, this person is non-Dutch [26].

Table 5 Characteristics of the video-taped consultations.

	N (%)	Minutes (SD in minutes)
Number of videos analysed		
number of content analyses	268 (99.6)	
number of RIAS analyses	269 (100.0)	
number of integrated consultations	191 (71.0)	
number of separate counseling consultations	7 (2.6)	
number of integrated consultations only counseling on tape	71 (26.4)	
analysis of client-directed gaze	253 (94.1)	
analysis of GAM	245 (91.1)	
Duration		
overall duration of video-tapes	269 (100.0)	31.33 (16.68)
duration of first consultation including counseling	191 (71.0)	39.55 (11.11)
overall duration of counseling	269 (100.0)	9.21 (4.26)
duration of counseling part the first consultation	191 (71.0)	9.49 (4.37)
duration of counseling if only counseling was video-taped	71 (26.4)	8.49 (3.91)
duration of separate counseling consultations	7 (2.6)	8.89 (4.40)

Information on clients declining participation

Non-response information was available from five of the six participating practices, from 136 pregnant women, not from their partners. These five practices provided 97.5% data. We only found a significant difference for parity: the percentage of multiparas in the non-participant group (75.6%) was higher compared to the percentage multiparas among participants (59.9%), Chi-square test for independence (with Yates Continuity Correction) was $p=0.003$. No significant differences were found for age or ethnic origin. Education level was only noted in 15.4% of the cases, thus a statistical comparison could not be made. The main reasons noted to refuse participation were: client just does not want to participate; partner refuses to participate, client has a difficult (medical) history.

Reliability of the recordings

Inter-rater reliability of content and non-verbal communication

Inter-rater reliability between the observers was tested for each scoring item in the protocol for 26 out of 268 video consultations (9.7%); the Kappa coefficient per item ranged from 0.31 to 0.78 (mean 0.56) indicating moderate to very good agreement [21]. Regarding client-directed gaze the inter-rater reliability was calculated on a random sample of 10.3% ($N=26$) of the video-tapes for which this coding was possible ($N=253$); the Intraclass Correlation Coefficient (ICC, single measures) ranged from 0.64 to 0.92 indicating moderate to very good agreement.

Inter-rater reliability of RIAS

Inter-rater reliability was calculated on a random sample of 9.7 % ($N=26$) of the study videotapes ($N=269$). Intraclass correlation (ICC) was used to measure the inter-rater reliability for midwife, client and partner categories with a mean occurrence greater than 2% (i.e. any occurrence had to be at least 2% of the total), which proved to be adequate [22,23]. The ICC was rated as Kappa.

Coding categories for midwives had a substantial mean ICC (ICC single measures) of 0.62 (Range = 0.58 – 0.65). The average ICC of client coding categories (ICC single measures) was moderate with 0.53 (Range = 0.30 – 0.56) and the mean ICC of partner categories (ICC single measures) was good with 0.71 (Range = 0.59 – 0.82). The partner category consisted of only one category, namely backchannels. The mean ICC of the counseling topic was also almost perfect with 0.99 (Range = 0.99 – 1.00).

DISCUSSION

In this paper, we describe the introduction and resulting dataset of video recordings in a naïve population: primary care midwifery. Midwives in the Netherlands, unlike many other health professionals, had not yet been exposed to video recording as a tool for research. Also, in the recorded first prenatal visit, there is no established relation between the midwife and her client, which may require more effort to gain trust needed to consent to the recording. Because of the new situation for both midwives and their clients and because there are very few papers recounting the complex recording process, in this paper, we describe the Introduction process. In addition, we report on the data coding procedure and the resulting dataset in terms of quantity and quality.

The use of recordings for research purposes posed a number of challenges. These challenges are described in terms of the framework introduced earlier: the *introduction* in the practice setting, the *complexity* of the associated data collection including data-linking, the possible *intrusiveness* of the camera, and determining the needed *quantity* of the recordings.

For the *introduction*, we identified the need to ensure commitment of health care providers to the research prior to enrolling the practice group as part of the study. Despite initial consent, some practices and midwives did not agree to participate. Voiced reasons for non-participation at practice level were not video-related (i.e. not convenient for the practice at the moment, on grounds of a pregnant colleague and, not convenient for fear that clients would decide to change to a different practice). Because we wanted to limit the relative contribution of a larger practice on the dataset, this provided midwives in larger practices with an opting out option. In the end, the practices that agreed to participate turned all out to be larger practices (≥ 4 midwives) and in these practices, not all midwives agreed to participate. This was left at the discretion of the practice; it could be that individual midwives

did not participate because recording was unfamiliar to them or for practice management reasons.

Second, an introductory period provided opportunity to adjust to the recording process, allowing for necessary changes to be made to the initial protocol. In our study, the provision of a word-by-word script to invite clients to participate in the study proved to be crucial for commitment of midwives to the study and for recruitment of clients. A subsequent change to the protocol related to the recording. Depending on the preference of the practice, three different recordings could be made: a complete first prenatal consultation; only the counseling part within the first prenatal consultation; or for practices that provided a complete, separate session for prenatal counseling, recording of that session only. This change resulted in a recording of the entire first prenatal consultation for most practices, even though the initial focus of the study was on counseling for congenital anomalies. And since all first consultations are likely to be similar in content, this avoided cross-practices comparison issues, which allowed for an extension of our research focus to include all the health education aspects that are included in the first consultation.

Finally, we feel that an introductory period may also increase feelings of control for the midwives and their assistants and enhance cooperation.

With regards to *complexity* of the data set, a meticulous description of the recording process, and close monitoring of the data collection by researchers is necessary to prevent loss of data. For example in our study, the 19 failed recordings (table 2) may have been prevented if early check-ins and additional assistance with technical aspects of taping were addressed; 18 sessions taped by non-midwife counselors may have been avoided if we included the credential of who was recording on the clinician data collection form. In studies such as ours, where the video data are to be linked to other data sets, careful attention must be paid to the unique identifiers that will allow the linkages. In our study matching the data with medical records resulted in a considerably reduced sample.

The coding system used seemed appropriate, although the complexity of the data coding could negatively influence the results through low ICC's especially for rare coding categories. The *intrusive nature* of video recording did not appear to be a problem and may reflect the fact that participating midwives were less concerned about being recorded. Midwives who agreed to participate quickly got used to being recorded and even reported on the fact that being taped itself was already an insightful experience [24]. Even though we were working in a situation where clients would be meeting their midwife for the first time in this pregnancy, client participation was high with nulliparous women being more inclined to participate, suggesting that lack of an established HCP-client relationship was not a barrier to participation in our study.

In terms of *quantity*, the video study has resulted in a dataset consisting of 269 video recordings of first prenatal consultations, involving 269 clients, 194 partners and 20 midwives

from 6 practices, providing unique insight into the communication skills of midwives, with no evidence of it acting as an intervention [9]. The relative contribution of a single midwife and of a practice on the total varied a lot in our sample, which may hamper subsequent analyses. We were not able to record the initially set goal of 15-20 recordings per midwife; instead we required midwives to have recorded a minimum of seven interactions in order to be included in the study. Closer monitoring may have assisted in meeting our original goal and resulted in a more balanced data set in terms of recordings per midwife and participating midwives per practice.

Limitations

Overall, our results indicate that our sampling efforts were adequate. Our purposeful sampling appears to have been adequate. Our sample of midwives compares well to the national sample (table 3). For the client sample, on-going monitoring may have better balanced the number of multiparous women.

Video recording as a method may exclude some clients or lead to refusal from others (e.g. clients with personal issues or for example a medical history of miscarriages) and this may lead to bias and reduced generalisability of the results. This may however depend on the research question, e.g. if the focus of the study was on women with personal issues or with a history of miscarriages.

Since there was no clear-cut information on cut off points for inclusion for the number of practices, midwives (per practice) and recordings per midwife, we made arbitrary choices. Future research may provide better underpinning for these decisions.

Conclusions

Video recording in midwifery practice has resulted in a unique database of 269 recordings, involving 269 clients, 194 partners and 20 midwives from 6 midwifery practices on midwife-client interaction of primary care midwives in the Netherlands, supplemented with additional data gathered through questionnaires and linked medical records.

The implementation of a video recording study requires a tight design, careful attention and vigilant monitoring during the data collection in order to ensure a satisfactory end result.

Author contributions

LM, JG and MP conducted the data collection and analysis. ES initiated and coordinated the DELIVER study. EH supervised the DELIVER study. SvD designed and supervised the video observation study. All authors participated in discussing the design of the study and developing the research protocols and questionnaires. ES drafted the manuscript, and all authors read and corrected draft versions of the manuscript and approved the final manuscript.

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