Improving Information Adequacy of Clinical Morning Reports: Development of a Structured Model in the Obstetrics and Gynecology Department

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Abstract

Background: This study was aimed to improve the information adequacy of clinical Morning Reports by developing a structured reporting model.

Methods: This study was a qualitative research conducted in three phases at the Obstetrics and Gynecology Department of three educational hospitals in northeastern Iran. After investigating the current status of MR sessions, the content of 120 reports were included extracted. The items were assigned subject groups for primary structuring while their validation getting confirmation using a two-round Delphi technique involving 10 specialists. Then, the structured model of clinical MRs was developed in two formats: structured paper-based form (SPF) and structured electronic format (SEF). The final evaluation was conducted comparing three practices of SPF, SEF, and conventional formats.

Results: All studied MR samples were found unstructured in content. From 120 collected samples, 58 items were extracted and categorized into four categories. During the first Delphi round, all existing information were preserved with varying weights. but the participating experts also suggested six additional items to be included. In the second round, 11 items with the lowest scores were removed. Results of the comparative evaluation showed that the SPF format scored highest on the preference of use, ease of archiving and retrieval, application in future research, and ease of reporting. The SEF format scored highest on the clear understanding of patient status and readability.

Conclusion: Using a standardized structured morning report based on the preference of local experts improves the quality of morning reports in various matters including efficiency, adequacy, and ease.

Introduction

Clinical education is considered as the heart of medical education with an emphasis on individualized patient-related issues (1). Much of the educational process for medical students is done in real-world settings and through interaction with patients. As such, clinical education is fundamentally different from teaching in other disciplines (2). Matching theoretical knowledge with objective examples helps the learning process and long-term memorization of teaching material. Patient-based learning helps students to correct the misconceptions of their theoretical knowledge and reinforces the right ones (3). Among the different methods of clinical education, morning report (MR) is the most widely used routine in the world (2). A standard morning report is a session attended by clinical professors, their assistants, and the interns and externs focused on presentation of selected clinical cases from the most recent admissions, particularly the ones from last 24 hours (4).

Morning reports are practiced in various ways using different locally to globally known methods. MRs cover a wide range of activities including an overall report of recent clinical events, analysis of various differential diagnosis and the choices of therapeutic, evaluation of residents' performance, assessment of the care provided to patients, identification and discussion of potential adverse events, and managing case-based controversies (5). The main purpose of MR sessions is to discuss clinical cases and, subsequently, to master how to make an informed clinical decision (6).

The MR format may vary from institute to institute, but they all share some common features. For instance, there is often a case-based presentation, during which a case is discussed from various angels and perspectives. Over the years, various learning approaches have attempted to improve the case-based presentation in MR sessions (5). Research has shown that structuring clinical report improves the quality (7), reduces ambiguity, and increases accuracy, clarity, and value of clinical documents (8). Although preparing structured clinical reports is a considerably time demanding process for physicians as compared to the choice of free-text format, evidence has shown that at the end, such reports are the most satisfying forms to medical team (9).

Literature shows little evidence regarding attempts to propose structures for morning report case presentation items, while there seems to be no doubt that a coherent structured report form with expert-agreed information items would make immersive improvements. This study was aimed to research such needs and top propose a model while testing the result for evidential assurance.

Methods

This was a qualitative study that included the investigation of information adequacy and also development, validation, and evaluation of a model to produce structured clinical morning reports conducted at the department of Obstetrics and Gynecology of three teaching hospitals in north-eastern Iran. This structured report is developed in two separate formats. The study was conducted in three phases, as follow.

Phase I: Studying current status of MR documentations

In the first phase, a survey was conducted to examine the current quality of MR documentations in the participating hospitals. For this purpose, a checklist was developed in two sections with a focus on the structure and documentation of clinical MR sessions, borrowing items from previous studies (5,10,11), followed by an expert-panel check and verification step (Table 1. Shows the characteristics of the participating experts: C01, C02).

The initially developed checklist was completed by three gynecologists and obstetricians in charge of MR session management at the time of research conduction in the three mentioned hospitals.

Table 1. The Expert-panel characteristics with identification codes

Code	Specialty	Gender	Age (Y)	Academic Degree	Related work Experiences (Y)
C01	Obstetrics and Gynecology	Female	50-60	Professor	>20
C02	Obstetrics and Gynecology	Female	50-60	Associate P.	>20
C03	Medical Informatics	Male	40-50	Assistant P.	<20
C04	Medical Informatics	Female	30-40	Assistant P.	<20
C05	Biostatistics	Male	40-50	Assistant P.	<20

A total of 120 MR reports were selected based on random sampling among the currently available reports within the report archive. All reports were in “free-text” format. Every report was thoroughly read and analyzed in order to extract informational items.

In the next stage, the list of extracted items was provided to the four members of the panel (Table 1. Involved experts: C01, C02, C03, C04). After reviewing by the panel, all extracted items were approved and subsequently classified into four thematic categories. The pre-approved list of items and categories were then shared for two rounds of enhancement and approval a modified Delphi technique as follow:

A) In the first round, all final items were assessed by ten clinical experts from the participating hospitals, none was part of the expert panel. Table 2 shows general characteristics of the experts who participated in the Delphi study. Each item was allowed to be tagged for removal or to be kept based on the agreement quotient. Accordingly, the items with greater than 75% agreement quotient were kept in the first round and were not passed to the second round. The items with 50% to 75% agreement quotient were reassessed in the second round; and items with an agreement quotient of below 50% were omitted. After the end of the first round, all extracted items obtained more than 75% agreement quotient. However, new items were also suggested by experts.

B) In the second round, clinical experts were requested to score the value of each item. Accordingly, the Likert Scale was used in a discrete and typical format of an interval scale, ranging from one (strongly disagree) to five (strongly agree). Then, the mean and standard deviation (SD) of scores for each item were calculated, and then a cut-off point was selected. The mean scores below this point were those items that were to be removed from the list.

Table 2. General information about the experts who participated in the items validation stage

Expertise	Gender	Age Group (Y)	Academic Degree	Related-work Experiences (Y)
Obstetrics and Gynecology (n=10)	Female (n=10)	50-60 (n=4) 40-50 (n=1) 30-40 (n=5)	Full Professor (n=1) Associate Professor (n=1) Assistant Professor (n=3) Resident(n=5)	>20 (n=3) 10-20 (n=2) <10 (n=5)

Phase II: Developing a Structured Model for Clinical Morning Reports

In this phase, a structured model of clinical MR was developed based on the previously validated items. This model was created in two formats: structured paper-based form (SPF) and structured electronic format (SEF).

The SPF format was developed in two parts: general and specific. In the first part, based on the opinions of the two expert panel members (Table 1. Involved experts: C01, C02), the general information items for report forms were added. The specific part included all confirmed items from the Delphi technique, like general patient information, pregnancy details information, disease background, surgical history, midwifery history, drug use history, previous hospitalization, signs and symptoms, lab information, ultrasound data, as well as an attachment option for clinical images (shown in Table 3).

In order to create the SEF format, an electronic version of the SPF was produced using a Windows-based software built using Microsoft Visual Studio 2010. Additionally, we built an MR SEF archive using Microsoft SQL Server 2008 Database and Stimulsoft Reports 2010 software.

Table 3. The obtained items from the validation stage for using in the structured clinical morning report

General Report's Information		General Patient Information			Previous Obstetric History	Disease Background	Surgical History
On-call physician name	Number of clinic visits	First name and last name	Admission date	Admission time	Gestational age	Diabetes	Uterus
Number of hospitalized patients	Number of NVD	Age	Prenatal care	LMP	Root of delivery	BP	Ovarian
Number of CS	Curettage number	EDC	Marriage family relation	Unwanted pregnancy	Pregnancy type	CVD	Others
Vacuum number	Laparotomy number	Pregnancy by medicine	MG	PG	Date	Renal disease	
VBAC number	Residents name	Ab	LC	DC	Comments	Drug addiction	
		EP	Estimation of gestational age by LMP	Estimation of gestational age by ultrasound		Smoking	
		CC	Current situation			Others	

Midwifery History	Drug Use History	Previous Hospitalization	Signs and Symptoms	Lab Information	Ultrasound Data	Others
Infertility	Drug name (Generic)	Date	AF	Date	Date	Disease progress
Curettage	Duration of use	Cause	BP	Time	Actual gestational age	Final diagnosis
Stillbirth	Drug dosage	Therapeutic care	FHR	Test name	The present of gestational age	Diagnostic measures
Repeated abortion	Discontinuation date		FH		Amniotic fluid index	Therapeutic measures
Others	Reason for Discontinuation		VB		Placenta position	
			T		Comments	
			RR			
			PR			
			TV			

NVD: Normal Vaginal Delivery, CS: Cesarean Section, LMP: Last Menstrual Period, EDC: Estimated Date Of Confinement, MG: Multigravida, PG: Prim gravida, Ab: Abortion, LC: Living Children, DC: Dead Children, EP: Ectopic Pregnancy, CC: Chief Complaint, BP: Blood Pressure, CVD: Cardiovascular Disease, AF: Amniotic Fluid, FHR: Fetal Heart Rate, FH: Fundal Height, VB: Vaginal Bleeding, T: Temperature, RR: Respiratory Rate, PR: Pulse Rate, TV: Test of Vagina

The face and content validity of the developed structured forms were checked by three members of the expert panel (Table 1. Involved experts: C01, C02, C03). As a result, some item classes were revised and some items of the initial form were merged, splitted or replaced.

Phase III: Evaluation of the proposed model

In order to evaluate the quality of proposed structure model, a questionnaire was designed consisted of two sections. Section 1 was aimed at measuring the adequacy of the finally selected items, and Section 2 was focused on the comparisonal assessment between the three clinical MR formats (conventional, SPF, and SEF), in terms of readability, clarity of patient status, ease of reporting, future research application, ease of archiving and retrieval, and preference for use. Both sections were using independent questions. The questionnaire was initially provided to the expert-panel members (Table 1. Involved experts: C03, C04, C05) for review and approval.

A total of 16 MR documents were selected based on the opinions of the consulting experts containing different scenarios. Afterward, the reports older than three months were taken into consideration.

To prepare the three formats, the same residents in charge of the original report were asked to produce the SPF format for the same patients. Later, the SEF format of each report was produced by the research team using the completed SPF content.

For final evaluation, all three formats, including the SPF, SEF, and the conventional formats were shared with the selected experts for comparison and evaluation. Overall, sixteen MR documents in three formats (n=48) were provided to 20 residents of Obstetrics and Gynecology (excluding those who participated in previous tasks) along with the questionnaire. Excel 2010 was used for the analysis of the results.

Results

Survey of Current Status

The results of the survey of the current status showed that the current MR documentation in all three hospitals was based on non-structured case-based reports reflecting on the patients' logbooks. Table 4 shows the results of the current status of clinical MR sessions and documentation at hospitals A, B, and C.

Table 4. The current status survey in hospitals A, B, and C

No.	Class	Item	Hospital		
Survey on the documentation of the sessions					
1.	Log reporting	No logging	-	-	-
		Manual	A	B	C
		Electronic	-	-	-
2.	Report analysis	Structured	-	-	-
		Unstructured	A	B	C
		Hybrid	-	-	-
3.	Report access	Manual (Available)	-	-	-
		Manual (On-demand)	A	B	C
		Online access	-	-	-
Survey on the structure of the sessions					
1.	Reporting method	Slide-based	-	-	-
		Logbook-based	A	B	C
		Case-based	A	B	C
2.	Reporter	Medical resident	A	-	-
		Medical intern	-	-	-
		Intern + Resident	-	B	C
3.	Patient selection	Head of the MR	A	-	C
		Attending resident	A	B	C
		Reporting person	-	-	C
4.	Facilitator	Fixed facilitator	A	-	C
		Interval facilitator (Faculty members)	-	B	-
		Interval facilitator (Medical residents)	-	-	-
5.	Participants	Medical residents	A	B	C
		Medical interns	-	B	C
		Medical Staggers	-	B	C
6.	Frequency of sessions	All non-holidays day	A	B	C
		Every other day	-	-	-
		Once a week	-	-	-
7.	Attendance control	Verbal control	-	-	-
		Electronic form	-	-	-
		Manual form	A	B	C
8.	Assessment	Written	-	B	-
		Verbal	-	-	C
		No assessment	A	-	-

Items extraction, validation, and categorization

58 information items were extracted from 120 reports. They were then validated and categorized by 10 experts into four categories using the two-round Delphi-technique. In the first round, all items with a score above 75% entered the second round. Experts also suggested six new items in this

round, and a total of 64 items was achieved (Table 5).

Table 5. Delphi's first-round; Experts agreement quotient and new items suggestion

Data Class	No.	Agreement Quotient (%)			Suggested Items	Final Items
		<50	50-70	>75		
1. General Patient Information	18	0	0	18	3	**21**
2. Patient History	19	0	0	19	2	**21**
3. Signs and Symptoms	14	0	0	14	0	**14**
4. Rest of Information	7	0	0	7	1	**8**
Total	**58**	**0**	**0**	**58**	**6**	**64**

In the second round, the experts scored the 64 items using a 5-point Likert Scale. An initial investigation of the assigned scores showed that the scores did not follow a scattered pattern, and therefore, calculation of the mean score was practical. Accordingly, a cut-off point of 4 was set, and the items with a lower score were omitted.

Table 6 shows the mean and standard deviation (SD) of the scores assigned to each item. “Test of Vagina” and “Fundal Height” from the “Signs and Symptoms” category and “Blood Pressure” from the “Patient History” category, were assigned the perfect score (5±0). Based on the cut-off point of 4, “Menstrual Status” (3.7±1.06), “Date of Marriage” (3.4±1.17), and “Contraceptive Methods” (3.5±1.27) from the category of "General Patient Information", “Transfusion” (3.7±1.64), “Rh Incompatibility” (3.6±1.17), and “Cause of Drug Use” (3.7±1.16) from the “Patient History” category, “Contraction” (3.9±1.6), “Infected” (3.7±1.25) and “Estimated Fetal Weight” (3.7±0.95) from the “Signs and Symptoms” category, and also “Operation Report” (3.7±1.25) and “Neonatal Information” (3.7±0.82) from the category of “Rest of Information”, were removed based on the selected cut-off.

Table 6. Delphi's second-round; Scoring the items using the 5-point Likert Scale by experts

General Information				Patient History			
No.	**Item**	**Mean**	**S.D**	**No.**	**Item**	**Mean**	**S.D**
1	First name and last name	4	0.47	22	Diabetes	4.8	0.42
2	Admission date	4.30	0.67	23	Blood Pressure (BP)	5	0
3	Admission time	4	0.82	24	Cardiovascular Disease(CVD)	4.9	0.32
4	Age	4.60	0.52	25	Renal diseases**	4.1	0.74
5	Multigravida (MG)	4.70	0.48	26	Drug Addiction	4.5	0.85
6	Living Children (LC)	4.70	0.67	27	Smoking**	4	1.05
7	Abortion	4.20	1.03	28	Transfusion *	3.7	1.64
8	Marriage family relation	4	1.05	29	Ovarian surgery	4	1.15
9	Last Menstrual Periods (LMP)	4.90	0.32	30	Uterus surgery	4.2	1.14
10	Menstrual status *	3.70	1.06	31	Curettage	4	1.15
11	Marriage Date (MD) *	3.40	1.17	32	Repeated abortion	4.1	1.10
12	Estimated Date of Confinement (EDC)	4	1.05	33	Infertility	4.40	0.84
13	Root of delivery	4.40	0.7	34	Stillbirth	4.30	0.95
14	Primigravida (PG)	4.20	1.03	35	Rh Incompatibility *	3.6	1.17
15	Contraceptive methods *	3.50	1.27	36	Drug name (Generic)	4.2	0.92
16	Chief Complaints (CC)	4.60	0.97	37	Cause of Drug Use *	3.7	1.16
17	Current situation	4.90	0.32	38	Drug dosage	4.1	1.1
18	Previous Obstetric History	4.4	0.84	39	Duration of use	4	1.41
19	Pregnancy by Medicine**	4	0.67	40	Use discontinuation date	4.2	0.92
20	unwanted pregnancy**	4.2	0.79	41	Reason for use discontinuation	4.3	0.82
21	Ectopic pregnancy (EP)**	4	0.82	42	Previous hospitalization	4	0.94
Signs and Symptoms				**Others**			
No.	**Item**	**Mean**	**S.D**	**No.**	**Item**	**Mean**	**S.D**
43	Respiratory Rate (RR)	4.1	1.10	57	Diagnostic measures	4.3	1.06
44	Blood Pressure (BP)	4.9	0.32	58	Final diagnosis	4.9	0.32
45	Pulse Rate (PR)	4.7	0.48	59	Therapeutic measures	4.9	0.32
46	Temperature (T)	4.5	0.85	60	Operation Report*	3.7	1.25
47	Test of Vagina	5	0	61	Neonatal Information*	3.7	0.82
48	Fundal Height (FH)	5	0	62	Ultrasound Data	4.7	0.67
49	Fetal Heart Rate (FHR)	4.8	0.42	63	Lab information	4.9	0.32
50	Gestational Age (GA)	4.9	0.32	64	Disease Progress**	4.3	0.67
51	Contraction*	3.9	1.6				
52	Infected *	3.7	1.25				
53	Prenatal care	4	1.15				
54	AF Amniotic Fluid	4.6	0.84				
55	Vaginal Bleeding (VB)	4.6	0.84				
56	Estimated Fetal Weight (EFW) *	3.7	0.95				

*Removed Items, **Suggested items

Structured Model of Clinical Morning Report

The structured clinical MR model was designed in two sections. The first section included general information about the MR and the second section contained patient-specific information. As can be seen in Appendix 1, the structured report consisted of 64 items classified into eleven categories based on experts’ opinions.

Model Evaluation

i. Initial Structure Evaluation

In the initial evaluation of the structured model of MR based on the face and content validity check, the “Gestational Age” item was moved from the “Signs and Symptoms” category to the “General Patient Information” category and then separated into two items of “Gestational Age with LMP” and “Gestational Age with Ultrasound”. Furthermore, the “Prenatal Care” item from the “Signs and Symptoms” category was moved to the “General Patient Information”. It should be noted that to enrich the content of the structured model, appropriate sub-items were defined by two experienced Gynecologists for the items (Table 1. Involved experts: C01, C02). Figure 1 shows the sub-items that were defined for the main items of structured form. Finally, space was added to the structured model for attaching clinical images and also entering the individual characteristics of the individual who is completing the report.

ii. Information Adequacy Evaluation

To assess the information adequacy of the structured MR, the items were assessed from the perspective of adequacy (and non-necessity on the other side) by the residents (n = 20), while allowing them to suggest their desired items. Chart 1 shows that 20% of residents (n=4) rated the adequacy level of the model as very high, 50% (n=10) as high, and 30% (n=6) as moderate. In this part, no assessor classified the items as low or very low. Moreover, 20% of residents (n=4) rated the presence of unnecessary items in the structured MR as very low, 70% (n=14) rated as low, and 10% (n=2) rated as moderate. In this part, no assessor classified the items as high or very high (in non-necessity). It should be noted that at this stage, six items were proposed by the residents in four categories, as shown in Table 7.

Table 7. Information Items Proposed by Residents

General Information	Drug use History	Signs and Symptoms	Ultrasound Data
PPH (Postpartum Hemorrhage)	Start date of use	Abdominal Examination	Non-pregnancy Ultrasound
		Pelvic Examination	
		Speculum Examination	

iii. Comparisonal Evaluation of All Three Formats

The analysis for the comparisonal evaluation of all three formats is shown in Chart 2. Based on this assessment, the SPF format scored highest on the items of “Preference for use” (50%), “Ease of archiving and retrieval” (80%), “Application in future research” (80%), and “ease of reporting” (50%). The SEF format also scored the highest on the two items including ”Clear understanding of patient status” (60%) and ”Readability” (75%). The conventional format received a lower score than the other two formats - except for the item of “Preference for use”, that had a score between the SPF and SEF (30%).

Discussion

This study was aimed to develop a structured model for clinical MR documentation and presentation in the Obstetrics and Gynecology department of three teaching hospitals to improve the overall informational and presentation quality of morning report sessions. The model was developed in two formats: Structured Paper-based Form (SPF) and Structured Electronic Format (SEF). The overall format was developed in two sections: General Information and Patient-specific Information, which included 64 items in 11 categories. The prospective users of such model are gynecological residents who are in charge of running MR sessions almost every morning.

One of the crucial problems in clinical education is the lack of standardized documentation and, consequently, weakness in evidence-based medicine (12). In the current information systems, we also face problems such as widespread data, high data volume, and poor documentation (13). Our initial review of literature, globally and nationally, showed no evidence of any proposed uniform structure for morning report documentation and presentation, though, there were similarities among the practicing countries (including Iran), such as the number of meetings over a specific period (4,5,14), the person in charge of case presentation (14–16), session facilitators (4,14,17), the person responsible for patient selection, and type of individuals regularly attending sessions (4,5,18).

One of the purposes of MR sessions is to discuss different aspects of patients’ diagnosis and therapeutic options. Therefore, avoiding unnecessary information and having adequate and accurate information about patients is undisputable (5,19). According to the back-to-back chart regarding information adequacy of the structured form (Chart 1), 70% of residents estimated the presence of adequate items as high and very high, while 90% estimated the presence of unnecessary items as low and very low. Confirming the results on both sides of the chart showed that the developed structured model reliably covers information items to patients’ presentations in the MR sessions. The result of previous similar studies also confirm the results of our study (20–22).

In this study, twenty gynecological residents were provided 16 clinical MRs in order to compare three formats including conventional forms, SPF, and SEF (n=48). The results showed that 75% of residents indicated that the SEF format has more readability and 60% considered it a format providing a clearer understanding of patient status. This result can be interpreted as the potential benefits of electronic records as compared to paper formats. In another study, two formats of structured and free-text reporting were compared evaluating 330 reports by eleven experts from the perspective of

content and clarity. The results showed that an individual's satisfaction and preference for using structured reports were significantly different from unstructured reports (23).

More than half of our residents believed that using SPF format will facilitate the reporting workflow. In a similar study, eleven experts from eight countries examined structured reports of radiology at the focus group meetings. Similar to our findings, this study concluded that workflow facilitation was a benefit of using structured reports (24). Selectivity in the creation of data elements for recording and collecting data is considered as a central part of Medicine Art (25). Therefore, selection and use of predefined datasets to generate reports can improve the workflow process of patient reports and data.

According to the results of Ganeshan's study, one of the benefits of structured reporting is its positive impact on research and facilitation of data mining (26). The results of another study have also shown that using the structured form is useful for future research (27). It has also been shown that by implementing structured reports electronically, data mining and integration with decision support systems and clinical guidelines will improve (26). In the current study, with a significant difference, 80% of residents considered the SPF format as a more appropriate option for use in future research studies, which is in line with the results of the above-mentioned studies.

Archiving, maintaining, and retrieving reports documentation is a continuous communication process between clinical care team members that provides information on patients' health care status (28). This is essential for various educational and assessment purposes during MR sessions, but is nevertheless a challenging aspect of MR sessions (5,29). This challenge was covered in our study as our initial results showed that no standard system to archive and retrieve MR documents (Table 4). In the current study, for 80% of residents, SPF format was a better option for ease of archiving and information retrieval that could meet the information needs and improve the flow of documentation. Wrenn et al. used a structured form for patients referring to the emergency department over eight months, in which the results indicated a significant improvement in archiving and retrieval (27). Since the use of electronic databases can undoubtedly lead to better archiving and retrieval of information sources (30), it seems that the reason for this paradoxical deviation in residents' attitudes towards the paper format is mostly due to its structured appearance rather than the comparable potential values of SEF format, which contains both structure and archivability.

As the results showed, the preferred format for use by half of the residents was SPF and the other half preferred the conventional format (30%) and the SET format (20%), respectively. This comparison shows that practitioners prefer to use paper forms, whether in structured or free-text formats, compared to the use of computer systems. Using computer systems to enter clinical information is more difficult and less flexible than paper forms (31) and also data entry into the structured electronic form is more time demanding process (32). It is also worth noting that there is no teaching for ten-fingers typing in the Iranian education system and most residents are no exception. This is a very important observation, which explains why a lot of time is spent on typing, which results in an unwillingness to use electronic systems which requires rapid typing. Therefore, it seems that it will not only speed up reporting, but will also increase the workload and demand more time on the part of residents.

There were some limitations in our study. First, focusing on the opinions of local experts may reduce the generalizability of the developed model universally. However, we believe that the proposed methodology will be still useful in designing a similar local model in other countries. The study had also limited view in its medical focus on gynecology and obstetrics; however, we find no reason why our core proposition of giving structures to MR documentation could not benefit other departments as well.

Future studies in this area could take more advanced steps into incorporating automatic production of structured MR from free-text reports using Natural Language Processing (NLP). For this purpose, the obtained structure in this study can be used as a strong basis particularly in the area of obstetrics and gynecology. We also recommend future researchers to apply our methods to develop similar standards for structuring MR documentation in other areas of clinical specialties.

Conclusion

Investigating the information adequacy of the reports and providing the necessary items for presentation of cases in the MR sessions can enrich the clinical content and improve the educational and research quality of the reports. From the perspectives of the experts involved in the MR sessions of the gynecology department, the structured model was more valuable than the conventional format in terms of readability, improved documentation, easier archiving and retrieval as well as a better understanding of the patient's condition

Declarations

Conflict of interest statement

There are no conflicts of interest for any of the authors.

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Ethics statement

Ethics approval and consent to participate informed consent was not required to be obtained due to the nature of the study.

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Figures

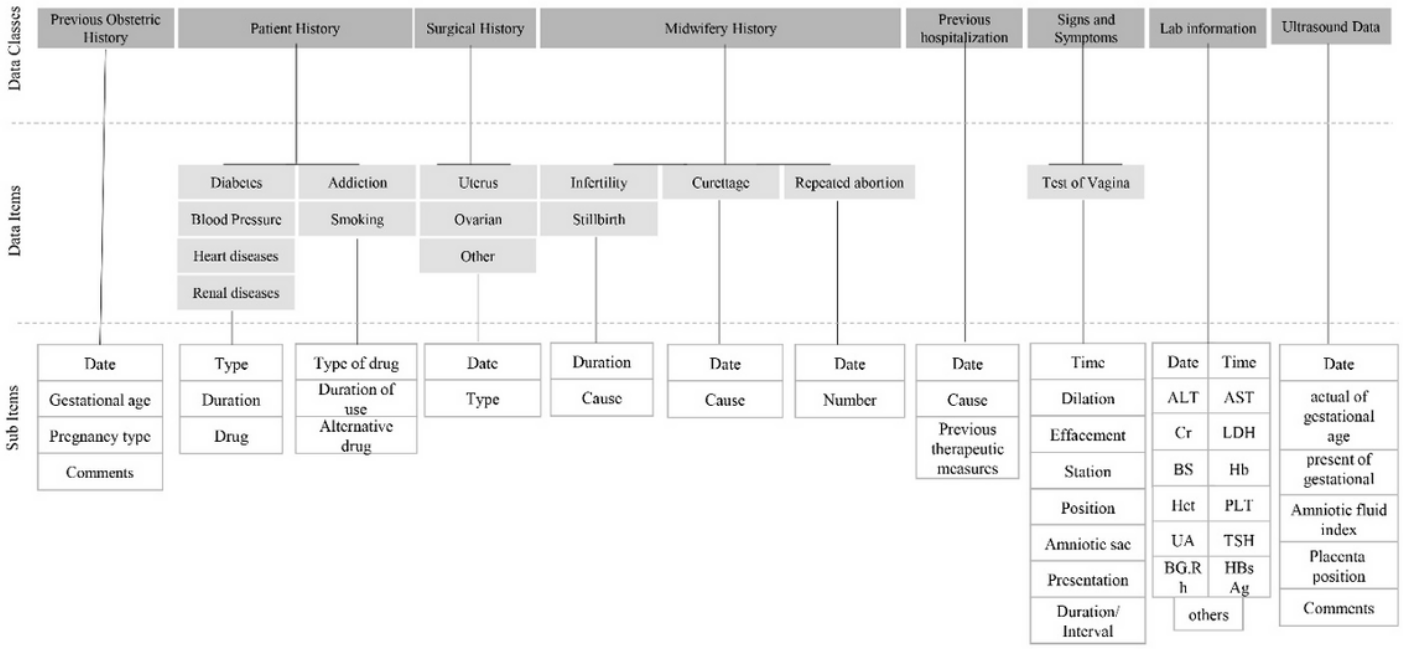

Figure 1

Defining the sub-items for structured morning report model's items by experts

Supplementary Files

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- Chart1.png

- Chart2.png
- Appendix1.docx