**American University of Armenia**
**College of Health Sciences**

# Investigation of Obstacles for Early Detection of Developmental Dysplasia of the Hip in Children A Qualitative Research Study

**Master of Public Health Thesis Project**
**Utilizing Professional Publication Framework**

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## Acronyms and Abbreviations

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|---|---|
| CDH | Congenital dislocation of the hip |
| DDH | Developmental dysplasia of the hip |
| FD | Family doctor |
| GoA | Government of Armenia |
| IAC | Information Analytic Center |
| IPOG | Institute of Perinatology, Obstetrics and Gynecology |
| PHC | Primary Health Care |
| RA | Republic of Armenia |
| UCH | University Children's Hospital |

## Abstract

Developmental dysplasia of the hip (DDH) is a disorder that requires early detection and especially early treatment. It is responsibility not only orthopedists, but also health practitioners and parents to help to prevent a delay in diagnosis of DDH.

The aim of this study is to explore the knowledge and attitudes of neonatologists, pediatricians/FDs, as well as mothers of children with DDH regarding DDH, in order to reveal possible obstacles for early detection of this disorder. This study will help to investigate the problem regarding DDH detection in Armenia more profoundly and from different sides: from neonatologists', pediatricians'/FDs', and mothers' points of view.

The qualitative research method has been chosen as more feasible and appropriate for this study. Twenty-two face-to-face in-depth interviews were conducted from June to August 2007 in Yerevan. Six of them were with neonatologists, 6 with pediatricians/FDs, and 10 with mothers of children with DDH.

This study was the first qualitative study that explored the situation of DDH in Armenia. The results of the study showed insufficient level of mothers' knowledge regarding DDH and lack of awareness. Mothers considered doctors responsible for late detection/treatment of this disorder and suggested starting improvements from maternity hospitals. Doctors' level of knowledge was not high, although they could describe diagnosing procedures and referral mechanisms. Doctors did not consider DDH their responsibility and preferred to rely on orthopedists for its detection. Doctors supposed DDH was diagnosed timely but thought that it could be missed in villages. The suggested ways for improvement of DDH management in Armenia, by doctors' opinion, should increase parents' knowledge and awareness.

Based on the results of the study it is proposed to conduct further research in this field. A quantitative study might help to figure out the true prevalence of DDH in Armenia as well as prevalence of late detected cases. The study shows necessity of training for doctors regarding DDH risk factors, early diagnosis, and examination skills. It is suggested improving doctors' and parents' awareness on DDH problem in Armenia.

# 1. Introduction

Developmental dysplasia of the hip (DDH) is a disorder that requires early detection and especially early treatment (5,7,9,10). It is the responsibility of orthopedists, health practitioners, and parents to help to prevent a delay in diagnosis of DDH.

The usual treatment of DDH, if it is diagnosed early, is conservative, the main point of which is to let the joint develop in the correct position. If diagnosis is delayed, the patients have to undergo a surgical treatment and a long period of rehabilitation. This is why it is very important to diagnose DDH and begin treatment as soon as possible after birth when the regenerative ability of the joint is high. Late diagnosis, especially after walking age, can lead to high complication rates leading to a deformation of the hip joint (10).

### 1.1 Background Information and Literature Review

Developmental dysplasia of the hip (DDH) is a condition that occurs because of abnormal development of the hip joint. For normal development, it is necessary that the head of the femur be located deeply in the acetabulum, otherwise the growth of the acetabulum will be disturbed, and it becomes shallow. Physiological laxity of joints in neonates facilitates dislocation of the hip (2,19). With time, anatomical changes progress, the capsule of the joint becomes narrow, and reduction of the hip is possible only after surgical operation (2).

Previously DDH was called congenital dislocation of the hip (CDH) but this term did not reflect the large spectrum of conditions such as subluxation, dislocation, instability of the hip, and dysplasia of the acetabulum (1). The American Academy of Pediatrics suggested replacing CDH with developmental dysplasia of the hip (DDH) as a more appropriate and accurate term (2,8,9).

The incidence of DDH is about 1-2 cases per 1000 newborns (2,3,4,10) in the world, but it varies in different countries from 1.5 to 20 per 1000 births (5,6). For example, in Sweden, the incidence is 5.6 per 1000 newborns (24) and in some regions of Saudi Arabia it is 3.5 per 1000 live births (18). In several countries the introduction of ultrasonographic screening programs increased the reported incidence of DDH in newborns (1 case per 100 newborns) because ultrasonographic methods can detect even instability of the hip joint, which is not always detectable at birth (2,7).

DDH is rare in China (3,4,20) and among African blacks (3,4,17), but its prevalence is high among Native Americans (3,22,23) and in other regions where the practice of swaddling is common (2,4,10). In Central European countries the prevalence of DDH among newborns varies between 2-20% (4,10). In Northern Europe and North America, the prevalence is between 0.2% and 2.0 % (4).

DDH is more common in females than in males. According to several studies, 80% of patients with DDH are females (3,4,11). The left hip is more frequently affected (60% of cases) than the right one (20%). Bilateral DDH is observed approximately in 20% of cases (4,10).

The etiology of DDH has not been fully understood. Among risk factors for development of DDH, family history is the most important. The risk of DDH increases by 6% in the case of an affected sibling, by 12% in the case of an affected parent, and by 36% when both a parent and a sibling have DDH (2,4,10). Other risk factors, besides female gender and family predisposition, are breech presentation at delivery (16-23%), first-born baby, oligohydramnios, congenital hyperextension of the knees, joint laxity, and several orthopedic malformations associated with dislocation of the hip such as cerebral palsy, myelomeningocele, arthrogryposis, and torticollis (2,4).

A factor that is of no small importance and contributes to development of DDH in infants is the positioning of the hips after birth. DDH is more common in cultures that practice swaddling and wrapping of newborns (2,4,10). In swaddling, the hips are forced into adductive position that increases the risk of developing DDH in not fully formed joints.

Early diagnosis of DDH is mostly based on physical examination. The main signs are observed by the Ortolani and Barlow maneuvers, widely used in the world in examining infants before 3 months of age (2,4,5,10,11). The purpose of these maneuvers is to “provoke” displacement of the femoral head from the acetabulum. These signs become negative as a child gets older and limited abduction in the hip joints becomes the most reliable sign of DDH in children of 3 months and over, as well as the Galeazzi sign for unilateral DDH (2,4,5,10). The Galeazzi sign is described as an observed difference in the levels of the knees at flexed position and the shortening of a leg. The other sign that may cause suspicion and is apparent in case of unilateral DDH is asymmetric skin folds (2,4,5,10). Ultrasonography and radiography help to confirm the diagnosis of DDH and supplement physical examination of the hip joints.

Treatment of DDH depends on the age of the child and the type of abnormality (instability, subluxation, dislocation, acetabular dysplasia). Orthopedists define the late detected case as case revealed after 3 months of age (2,4,6).

Usually from birth to 6 months age of the treatment is conservative (4,10). The Pavlik harness, which maintains immobilization of the hips in the corrected position but allows some range of motion in the hip joint, is applied on average for 6 weeks full time and 6 weeks part time. The success rate for treatment with the Pavlik harness is rather high; 95% for subluxations and acetabular dysplasia and about 80% in cases with definite dislocation (10,12).

If the hip is not stabilized in 3 weeks, closed reduction is performed that is also a treatment of choice for patients at age of 6 months and older. This procedure implies reduction and reposition of the hip under general anesthesia and under radiographic guidance with subsequent immobilization in a spica cast. The duration of treatment in a cast is about 12 weeks (4,10). Then the cast is changed to an abduction brace, which is worn for 6 months.

Open reduction of the hip is performed if the previous treatments are not successful or in late-diagnosed cases. It involves surgical removal of barriers for reduction of the joint. After the reduction, the cast is applied for 6-8 weeks. This treatment requires a course of hospital rehabilitation lasting about 4 weeks. Pelvic reconstructive surgeries are the next stage in treatment of unsuccessful reductions and are also used in older children (10,13).

The main complications of the treatments of DDH are avascular necrosis of the femoral head, femoral nerve palsy, redislocation, and complications involved in surgical procedures and anesthesia (4,10,13).

Specialists agree that early diagnosis of DDH is crucial for effective treatment. Early diagnosis and treatment of DDH may have successful results with low rates of complications and without surgical intervention (2,4,6,10,13). At the same time, the experience of other countries shows that treatment of early-diagnosed cases is more cost-effective than for delayed cases, which mainly require surgical treatment (15,16). Late diagnosis and late treatment of DDH often lead to significant long-term morbidity and disability. Untreated DDH may cause limp, pain, and complications development in older ages. Osteoarthritis of the hip joint is a threatening complication that may develop in a mature age (25-30 years) (4,10). About 10% of all replacements of the hip joint in the world are due to DDH (14).

### 1.2 Developmental Dysplasia of the Hip in Armenia

To the best of our knowledge, research on DDH has not been done in Armenia previously. Moreover, the National Center of Health Statistics does not collect data on DDH routinely. The following information about DDH in Armenia was supplied by the Department of Pediatric Orthopedics and Trauma at the University Children's Hospital #3 in Yerevan and the Chief of the department, Dr. G. Koloyan[1].

The number of delayed and late detected cases of DDH is believed to be rather high in Armenia (Dr. Koloyan, personal communication, April 2007). According to data from the Pediatric Orthopedic Department at UCH #3 in the period from January 2003 to January 2007, only 9 cases (7%) out of 137 patients with a diagnosis of DDH were referred timely (before or at the age of 3 months). These patients were treated with conservative methods. The majority of patients (71%) were diagnosed at or after the walking age (8 months-18 months), when conservative treatment is not so effective. These children had to undergo closed reduction with general anesthesia followed by wearing of special braces for several months. About 1/3 of patients with DDH admitted to the hospital were children of three years of age and older and underwent surgical treatment (Appendix1). Based on previous studies, the rate of complications is the highest in this group (4,10,14).

According to another source that collects and analyzes information on disability in the Republic of Armenia, annually about 20 children of different ages are registered as physically disabled because of DDH (Information Analytic Center "Nork", Yerevan, letter of inquiry # 592; 16.07.2007). This database contains information on only registered disabled persons (Mr. H.

[1] **Garen Koloyan, MD,** is the Head of Pediatrics and Pediatric Surgery Chair #2, Yerevan State Medical University, the Chief of Pediatric Trauma and Orthopedic Department, University Children's Hospital #3, Yerevan, member of the European Pediatric Orthopedic Society and the Pediatric Orthopedic Society of North America.

Chobanyan, IAC "Nork", the director, personal communication, 16.07.2007). The proportion of disabled children with DDH among all children registered as physically disabled for the first time in the current calendar year is about 2% (1.47% in 2003; 2.6% in 2006). The proportion of DDH in the subgroup of congenital anomalies is about 20% for the period from 2003 to 2006 (Appendix 2).

According to the Ministry of Health, in Armenia, the examination for DDH should be performed after birth by neonatologists in maternity hospitals, by pediatricians or family doctors (FD) during newborn check-ups, and at the age of 3 months by orthopedic surgeons in polyclinics (Dr. G. Avagyan[2], personal communication, May 2007). But, in reality, a small percentage of newborns are examined for DDH. DDH continues to be missed at physical examinations in the early months, when treatment is most effective (25). It is possible to detect the majority of DDH cases at birth and treat them safely and successfully (10).

### 1.3 Conceptual Framework

According to information obtained from Dr. Koloyan, the main problem of DDH in Armenia is its late detection and delayed treatment. He highlighted two major factors that contribute to this problem. First, DDH cases are missed by doctors: by neonatologists in maternity hospitals and by pediatricians or FDs at routine check-ups. Second, parents present their children to specialists late. Each of these factors may have its possible reasons (Appendix 3). The hypothesized factors that may contribute to the problem of late detection of DDH in children are the following:

[2] **Gayane Avagyan, MD, PhD,** is the leading specialist of the department of Mother and Child Healthcare of the division of Healthcare Management at the Ministry of Health of the Republic of Armenia.

1). Doctors' knowledge and lack of awareness. The influence of these factors is very significant (26,27,28,29). Lack of knowledge and skills as well as lack of awareness on this disorder and its consequences can be causes for missing DDH cases at the examination or avoiding examination of the hips at all.

2). Lack of equipment. Equipment, which can facilitate diagnosis or confirm the diagnosis of DDH, such as X-ray machines and ultrasonographs can be mentioned by doctors as reasons for missing DDH cases, especially in neonates (2,7).

3). Accountability. General practitioners rely on narrow specialist and consider them responsible for not only treatment but also detection and diagnosis of DDH (6,26).

4). No guidelines. Doctors could mention absence of clear guidelines as a justification of failure to examine or diagnose DDH.

The hypothesized factors that may contribute to the problem of delayed referral to doctors by parents are the following:

1). Parents' knowledge and lack of awareness (30). This factor includes not only a level of general knowledge about childcare but it embraces the level of education as well as the willingness to understand and know more about health related issues.

2).Socio-economic status.

3). Access to care (location, availability of specialists).

The last two factors are closely related to each other. In spite of free health care for children up to seven, out-of-pocket payments are still very common in Armenia (31). Economic conditions of the family can be a cause of late visits to doctors, especially in remote rural areas, where lack of specialists and equipment complicate access to health care (31).

4). Social environmental factors. This group of factors includes social problems such as opinion of family members, number of children in the family, etc.

### 1.4 Goal of the Study and Research Questions

There is no previous research in the field of DDH in Armenia. However, the available information suggested that DDH management is very poor in Armenia and the majority of cases are referred to the doctors when the risk of complications is very high.

The aim of this study is to explore the knowledge and attitudes of neonatologists, pediatricians/FDs, as well as mothers of children with DDH regarding DDH, in order to reveal possible obstacles for early detection of this disorder. This study will help to investigate the problem regarding DDH detection in Armenia more profoundly and from different sides: from neonatologists', pediatricians'/FDs', and mothers' points of view.

The research questions of the study are the following:

1. What are doctors' attitude and level of knowledge on DDH?
2. What are mothers' attitude and knowledge on DDH?
3. What are the main obstacles for diagnosis of DDH among neonatologists and pediatricians/FDs in polyclinics?
4. What are the reasons for late referral to doctors from mothers' point of view?

## 2. Methods

The qualitative research method has been chosen as more feasible and appropriate for this study (33,34). This design will help to investigate the problem more profoundly and understand

the attitude of participants. This approach is more acceptable, when the underlying problem has never been investigated and it can be used to test a new framework (33,34).

### 2.1 Study Design and Study Population

The study populations were neonatologists, pediatricians/FDs, and mothers of children with DDH. Neonatalogists were chosen because they perform the examination of newborns after birth in maternity hospitals. Pediatricians/FDs represent the “first line” of primary health care (PHC) providers and carry out the surveillance of children from third day of life to adolescence (15 years). Mothers were selected as more available source of information and usually they spend more time with children, especially with infants, than other family members.

The inclusion criterion for doctors was: neonatologists and pediatricians/FDs, who were currently working in Yerevan. The inclusion criteria for mothers were the following: mothers of children diagnosed with DDH at any age and who completed treatment or are still undergoing treatment in the Department of Pediatric Orthopedics and Traumatology at the UCH # 3 in Yerevan.

### 2.2 Sampling Procedure and Data Collection

Sampling was based on feasibility and location. The researcher contacted mothers of patients with DDH in the hospital during their treatment or their visits to doctors for consultations in the Department of Pediatric Orthopedics and Traumatology at the UCH #3 in Yerevan. Eleven mothers were asked to participate, one of them refused because of child anxiety and crying. All face-to-face interviews, except one, took place in the UCH # 3. One mother preferred to meet out of the hospital because her child was sent home after a closed reduction.

Two maternity hospitals (Institute of Perinatology, Obstetrics, and Gynecology (IPOG) and Maternity Hospital #2) in Yerevan were selected based on convenience and their location. Seven neonatologists were approached at their working places; face-to-face interviews with six of them were completed. One neonatologist refused to participate motivating refusal with being busy. Pediatricians or FDs were interviewed in their polyclinics. Polyclinics that were easy to reach for the interviewer were chosen for data collection.

Twenty-two face-to-face in-depth interviews were conducted from June to August 2007. Six of them were with neonatologists, 6 with pediatricians/FDs, and 10 with mothers of children with DDH. Interviews with mothers took 20-25 minutes and with doctors 30-40 minutes. One interviewer conducted all interviews and hand written notes were taken.

**2.3 Study Instruments**

Semi-structured in- depth interview guides with open-ended questions were developed separately for doctors and mothers (Appendixes 4, 5). The guides were pre-tested with two mothers, 2 pediatricians, and 1 neonatologist to avoid any misunderstanding of questions.

The main domains for doctors' interviews include questions regarding doctors' general knowledge about DDH/CDH[3], the causes of the disorder, the ways of diagnosing and appropriate time for diagnosing, referral mechanisms, as well as questions about their attitude towards the DDH problem. Doctors were asked about their opinion for improvement of DDH management in Armenia.

The main domains for mothers' interviews include questions regarding their general knowledge about DDH/CDH before and after it was diagnosed in their children, the time of

[3] The terms DDH and CDH were used interchangeable. Although the term DDH is accepted worldwide, for this study CDH was used as more familiar and well known for interviewees.

referral to doctors for treatment, as well as about their attitude towards the DDH problem. They were asked about their opinion regarding factors for late referral for treatment and ways for improvement of DDH management in Armenia.

### 2.4 Data Analysis

All the notes were transcribed and translated from Armenian into English. Data analysis was done by hand through systematic review of transcripts. Data was coded using codes and labels (34). Several tactics were used during the analysis: noting patterns and themes, noting relations between variables, making comparisons, and simple counting (34). Interviews of mothers and doctors were analyzed separately. After preliminary analysis, the revealed themes were compared. One researcher did all interviews and data analysis.

## 3. Ethical Considerations

The study protocol was reviewed and approved by the Institutional Review Board of the American University of Armenia (Appendix 6). Permissions were received from the heads of healthcare facilities, where the interviews were conducted. Two consent forms, separately for mothers and for doctors, were developed. Before each interview, an oral consent form was presented to the interviewee. Written notes were taken during the interviews.

## 4. Results

Twenty-two interviews were completed for this study: 6 with neonatologists, 6 with pediatricians/FDs, and 10 with mothers of patients with DDH.

All participating doctors except one were females. The working experience of neonatologists varied between 11 and 35 years with an average of 22 years. For pediatricians the mean years of experience was 19 years with the range from 6 to 36 years.

The majority of mothers delivered in hospitals without complications after a normal pregnancy. One of them mentioned that delivered after Caesarian section and there was one case of premature birth. One woman delivered with attendance of a midwife only in the regional healthcare post (FAP). All children were girls; five of them were first-born babies. Three mothers had high school (university) education, one mentioned specialized nursing school, five mothers had secondary (ten grades) education, and one completed only eight grades. Four mothers were residents of Yerevan; others were from different regions of Armenia. One woman had two children with DDH. Four children out of 11 had bilateral DDH. The average time of diagnosis was about 12 months. Only one patient was diagnosed at the age of 3.5 months.

### 4.1 Doctors' Interviews

The qualitative data are presented according to research questions and themes revealed during the analysis.

***1. Situation with CDH in Armenia***

Doctors were asked to characterize the situation with DDH/CDH in Armenia or at least in their facility. All of them mentioned that this disorder is very rare in their practice. Some of the doctors stated that the number of CDH cases decreased over the last years.

*"I am working here almost 11 years but I did not meet any patient with congenital dislocation. I have not met even suspicious case."*

*"I would not say that the situation is terrible and it [CDH] is widespread. No, of course, there are some cases but not so many"*

*"The situation was worse before, it [CDH] was diagnosed later. There were many limping people on the streets. Now is better, but that is only in Yerevan; in regions, it is worse… I would not say that it is a problem in our hospital. There were years we did not diagnose any case. "*

The explanations for less frequent occurrence of CDH were different. Some of the doctors mentioned diapers ("Pampers") or swaddling lessening as a factor for reducing cases with CDH. A few said that it is due to improvements in antenatal care or because of timely diagnosis and treatment.

*"The care of pregnant women improves. There are some required checkups and tests for pregnant women. If they do all of them the baby will born healthy."*

*"The number of cases has decreased because swaddling decreased. It was grandmothers mistake that they bound legs very tightly."*

*"By the way, "Pampers"-s help. And as I know the same position is created at treatment. "Pampers" are worn immediately after birth that is why, maybe, I have not met the dislocation."*

***2. Doctors' knowledge on CDH***

In order to assess the level of doctors' knowledge they were asked about causes of DDH/CDH, ways and means of diagnosis, treatment, and consequences of untreated CDH.

The majority of doctors emphasized the role of pregnant woman nutrition and mentioned calcium deficiency as the main cause of CDH. Among other causes often were mentioned infections and traumas during the pregnancy. More than half of respondents said that CDH is a consequence of the delivery process. Familial predisposition or inheritance appeared in the half of the interviews and three respondents talked about the role of presentation at

pregnancy and delivery or mentioned swaddling as causal factor. One of the doctors said about predisposition of females to CDH.

*"Causes?... Calcium deficiency, maybe infections at the period of fetus development, fetopathy… Foot presentation. It [CDH] can happen at foot presentation, can be mechanical as a complication of delivery."*

*"Immaturity, prenatal infections, foot presentation. Maybe one pulls the baby at legs and the dislocation develops. Mother's malnutrition, calcium deficiency. A healthy child can be born and our grandmothers, you know, like to do exercises or swaddle and wrap tightly."*

*"Prenatal problems, inheritance. A grandmother of my patient had CDH. It can be mother's infections, or when the fetus is overweight and there is no enough space… It is a congenital malformation and not acquired, so that one pulls and develops a dislocation… Mothers' care for babies. In the past, we swaddled and now we keep a baby free in "Pampers"."*

The overwhelming majority described the diagnostic maneuvers used for the CDH diagnosis. Many of them mentioned limited abduction, asymmetry of skin folds, "click", and shortening of leg as signs of the CDH. Some of the doctors said that abduction is painful. A few mentioned that CDH might be confused with physiological muscular hypertonus in newborns. All respondents reported the importance of X-ray diagnostics for conformation of diagnosis. One doctor mentioned delayed walking and limp as diagnostic signs.

*" …if abduction is painful and baby is crying, it points to CDH. X-ray is necessary to confirm the diagnosis."*

*"We mandatory check for congenital malformations at the first examination of newborn. There are special methods to check. We look how large the legs are opened, the "click" symptom, then we turn the baby on the belly and look at symmetry of skin folds on both sides."*

The question about treatment mostly addressed the curability of CDH and factors that can affect it. All doctors said that CDH is curable and almost all of them mentioned the role of timely detection and treatment. Some of interviewees pointed out the appropriate time for start of treatment. Many of them think that treatment should be started before walking; a few of them said that the more appropriate time is immediately after birth, and all of them agreed that the sooner it starts the better will be the results.

*"It is 100% curable, if it is diagnosed early. For example, my brother's daughter. They achieved great results just after one month of treatment."*

*"It is completely retrievable thing; of course it depends on time of referral. The earlier, the better."*

*"All these [treatment] need to be done before the child starts to walk, before 1 year of age."*

Among the possible consequences, doctors point out the limp and duckling walk. Less frequently mentioned were spinal problems and subsequent posture disorders, and disability. Many of the interviewed doctors emphasized the psychiatric and social consequences for patient with untreated CDH.

*"Limp, duckling walk. Besides, from esthetic side it is not desired for those persons. You know, a person should be healthy for education, study, and work. And it is some kind of "stigma".*

*"Limp, might be problems with further pregnancy. It might have social consequences, too… Why be in a role of handicapped?"*

The doctors were asked to characterize their colleagues' level of knowledge on CHD and necessity of any training in this field. All the doctors agreed that training would not hinder, especially if they gain new knowledge. Some of them characterized knowledge of Armenian doctors as fair, others as very good. Few of participants hesitated or avoided judging their

colleagues. Two of them expressed the view that there is a difference in knowledge of doctors in urban and rural areas.

*"The level of knowledge is fair. All know the symptoms and there is no any complexity"*

*"Our doctors know about it [CDH] but at what extend… That is a question."*

*"It depends on doctors. In cities the level of knowledge is good but in rural areas, in villages it is not."*

***3. Responsibility***

The questions on the issue of responsibility were not clearly included in the interview guide. Respondents discussed them during their interviews. Some of the doctors put the responsibility for treatment results, delayed treatment, and consequences on parents; diagnosis and treatment were the orthopedists' responsibility. A few said that they are responsible for it. Several interviewees blamed social and economic conditions. Among others were mentioned gynecologists in women consultations and family members, who do not pay enough attention to the care of pregnant women.

*"If it is a curable and preventable disease, then we are blamed, we: neonatologist, orthopedist, polyclinic, and parents. First, doctors are blamed and then parents, because they might not adhere or follow. But it is just my opinion. A parent might not believe in diagnosis…"*

*"Mothers should be consistent; if she is obliging and she follows the treatment, and "does not close the eyes to it", the results will be better."*

*"I send to orthopedist for diagnosis and treatment, because they are engaged in it."*

*"I do not consider it [CDH] my pathology. Orthopedists see more cases and patients apply to them directly."*

***4. Reasons for late detection/treatment***

Among reasons for late diagnosis and treatment doctors mentioned mothers' "inconsistency", mothers' lack of knowledge and unawareness. Some of respondents linked delayed detection with the low level of doctors' knowledge and doctors' deficiency emphasizing that these problems existed only in rural areas. Two of respondents mentioned non-affordable healthcare services in Armenia as possible explanation for late referral for treatment. Only one doctor mentioned that lack of equipment in healthcare facilities might contribute to the problem. However, the majority of doctors said that CDH is diagnosed timely.

***5. Patients referral***

All the doctors were asked about referral procedures and almost all of them clearly described them. But, as one of the neonatologists said, they described "the protocol", because they did not often see patients with CDH.

***6. DDH as a public health problem***

Controversial results were obtained on the question, would they consider CDH a. Some of the doctors agreed that CDH is a public health problem, because *"it is a health problem"*. Several of respondents did not consider CDH a public health problem, because *"it is rare"* and *"it is not so common"*.

***7. Ways for improvement***

Among ways to improve the management of CDH in Armenia, the doctors mentioned seminars conducted by orthopedists. They also suggested increase parents' awareness and change parents' attitude towards CDH problem in order to increase on time referral to doctors.

**4.2 Mothers' Interviews**

***1. Mothers' knowledge***

In order to assess mothers' knowledge on DDH/CDH they were asked to tell what they knew about DDH/CDH before and after the diagnosis of DDH in their children. Almost all of them said that they had not even heard about it. Only one mother, who was a nurse, said that she knew some details about it. On the question what knowledge was gained after diagnosis, a few of them mentioned heredity as a main cause of CDH, swaddling as a possible and predisposing factor, and calcium deficiency. One of the mothers mentioned that CDH is more frequent in girls. The most common answers were "Don't know" and "Nothing". Two of the mothers said that they saw a child with CDH previously (a relative, a neighbor).

*"Well, doctors say it is genetic, but I don't know where it is come from. I even draw up a family tree."*

*"I don't understand what congenital (inherent) means… Doctors say, either the baby stays in the same position for a long time or moves very quickly in the womb."*

***2. Responsibility***

According to some mothers, doctors are responsible for late detection of CDH cases. Several mothers pointed out not only doctors in polyclinics< but also doctors in maternity hospitals.

*"This is a professional duty of doctors in maternity hospitals. They take it very easy."*

*"It was mentioned in my medical record that my first baby was born with CDH. I said about it to doctors but they did nothing."*

A few mothers mentioned that parents are responsible for late detection and treatment, but this opinion prevailed among mothers from rural areas.

***3. Reasons for late detection/treatment***

Among reasons for late diagnosis and delayed treatment, the majority of mothers mentioned insufficient level of doctors' knowledge. More then the half of interviewed mothers mentioned mothers' unawareness about this disorder, and only two of them said that financial problems were the cause for late referral to doctors.

*"Parents should take a baby to the doctors. I had no idea of this disease; otherwise I would take my baby to doctor earlier."*

*"Parents should be informed about it [CDH]. We noticed the disorder only when she started to walk. And pediatricians do not perform their duties properly."*

***4. Treatment start***

Mothers were asked when they start the treatment and the majority of them said that they started treatment in a week after diagnosing of DDH in their children.

***5. Examination by doctors***

All the respondents mentioned that pediatricians examined their children and several of them reported visits to narrow specialists in polyclinics (surgeon, neuropathologist).

***6. DDH as a public health problem***

More than a half of interviewed mothers would consider CDH a public health problem because *"it is very common"*. A few of them did not think about CDH as a problem because *"it is curable"*.

***7. Ways for improvement***

Among ways for improvement of CDH management in Armenia, mothers suggested improving doctors' knowledge in this field but the majority of them separated pediatricians in polyclinics and doctors in maternity hospitals. Almost all mothers mentioned that changes should

be started from maternity hospitals. Another way for improvement is to increase mothers' awareness about this disorder.

## 5. Discussion

The purpose of this study was to explore knowledge and attitude of pediatricians/FDs, neonatologists, and mothers' regarding DDH. The results of interviews with pediatricians/FDs and neonatologists were reported together because the responses were similar in terms of their knowledge and attitude. The themes identified during the analysis touch the hypothesized factors contributing to the problem of DDH in Armenia.

Summarizing the results of the study, by mothers' opinion, the existing level of doctors' knowledge and their unawareness are the main reasons for late detection of DDH cases. Some doctors support this opinion but they think that is a problem only in remote rural areas. On the other hand, doctors consider mothers' "inconsistency" as a major cause of late detection and delayed treatment of DDH. The majority of doctors could not correctly mention risk factors or causes of DDH. Many of them did not understand a pathological process and described factors such as calcium deficiency or infections at pregnancy that did not play role in pathogenesis of DDH. The majority of doctors did not see patients with this disorder, and could not correctly mention causes of DDH, although they could describe all procedures for its diagnosis and clearly explain the stages of patients' referral. Such hypothesized factors as lack of equipment and absence of guidelines were not supported by the respondents' opinions.

The issue of doctors' responsibility/accountability often emerged in mothers' interviews and it materialized in doctors' attitude towards the problem of DDH. Doctors do not consider it

their responsibility and they rely on narrow specialists in diagnosis. They think that DDH is timely diagnosed in Yerevan and it is missed in villages.

In general, such factors as access to health care and social problems have limited contribution to the problem of DDH. Three mothers and two doctors mentioned financial problems among possible causes for late referral to doctors.

According to results of the study, parents did not postpone treatment of their children and started it in a week after diagnosis. The assumption of delayed diagnosis due to parents' unawareness and lack of knowledge may be supported by the findings of the study, because mothers refer to doctors, when they notice some signs, for example, limping, or shortening of the leg. Unfortunately, very often it happens late, when the child starts to walk.

All interviewed mothers reported examinations of their children done by pediatricians before the diagnosis of DDH. This result may be interpreted in two ways. First, pediatricians do not examine baby's hips, and second, doctors fail to see pathology.

Suggesting ways for improvement, the respondents answered in accord with their suppositions who is responsible for late detection and delayed treatment of DDH cases. The interviewed mothers suggested increasing doctors 'knowledge and the doctors proposed to improve mothers' awareness and increase their level of knowledge.

### 5.1 Limitations

The study limitations are typical for the majority of qualitative studies (33,34). The study was conducted among ten mothers and twelve doctors and the results of the study cannot be generalized for the entire population. Only one researcher collected the data and did the analysis, which may introduce interviewer bias. The transcripts were translated from Armenian into

English. The translation may affect the meaning of statements or eliminate the sense given in the native language.

The strengths of the study are the chosen design of the study and systematic approach used during the data analysis. Design of the study allowed investigating of the problem from different sides and presenting the findings, which are “close to the truth” (33,34).

### 5.2 Conclusions

This study was the first qualitative study that explored the situation of DDH in Armenia. The results of the study show insufficient level of mothers’ knowledge regarding DDH and lack of awareness. Mothers’ considered doctors responsible for late detection/treatment of this disorder and suggested starting improvements from maternity hospitals. All mothers reported that they started treatment within a week after diagnosis conformation.

Doctors’ level of knowledge was not high, although they could describe diagnosing procedures and referral mechanisms. Doctors did not consider DDH their responsibility and preferred to rely on orthopedists for its detection. Mothers’ inconsistency was mentioned as a factor for late diagnosis and delayed treatment of DDH in children. Doctors supposed that DDH was diagnosed timely but thought that it could be missed in villages. The suggested ways for improvement of DDH management in Armenia, by doctors’ opinion, should increase parents’ knowledge and awareness.

## 6. Recommendations

Considering the results of the qualitative study among doctors and mother of children with DDH the following is recommended:

- To conduct seminars and lectures regarding DDH in order to improve doctors' knowledge on DDH risk factors, pathogenesis and modern methods of diagnosis.
- To provide doctors with continuous training to improve their practical knowledge and skills in early diagnosis of DDH.
- To increase parents' knowledge and awareness regarding DDH providing them with materials and advising to visit doctors timely.
- The results of this study might be used to develop questionnaire and to conduct quantitative study to assess the situation regarding DDH in Armenia and to obtain results that are more generalizable.
- To conduct a quantitative study to reveal prevalence of DDH in Armenia, as well as prevalence of late detected cases.
- To conduct a comparative study in order to evaluate situation on DDH in rural and urban areas of Armenia.

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## Appendix 1. DDH cases by treatment groups (2003-2006), UCH#3, Yerevan

| | Ambulatory treatment | Closed reduction | Open reduction | Pelvic plastic surgery |
|---|---|---|---|---|
| 2003 | 6(12.0%) | 21(42.0%) | 10(20.0%) | 13(26.0%) |
| 2004 | 2(4.6%) | 24(55.7%) | 7(16.2%) | 10(23.5%) |
| 2005 | 11(16.9%) | 35(53.8%) | 8(12.4%) | 11(16.9%) |
| 2006 | 10(17.5%) | 28(49.1%) | 8(14.0%) | 11(19.4%) |
| Total | 29(13.5%) | 108(50.2%) | 33(15.3%) | 45(21.0%) |

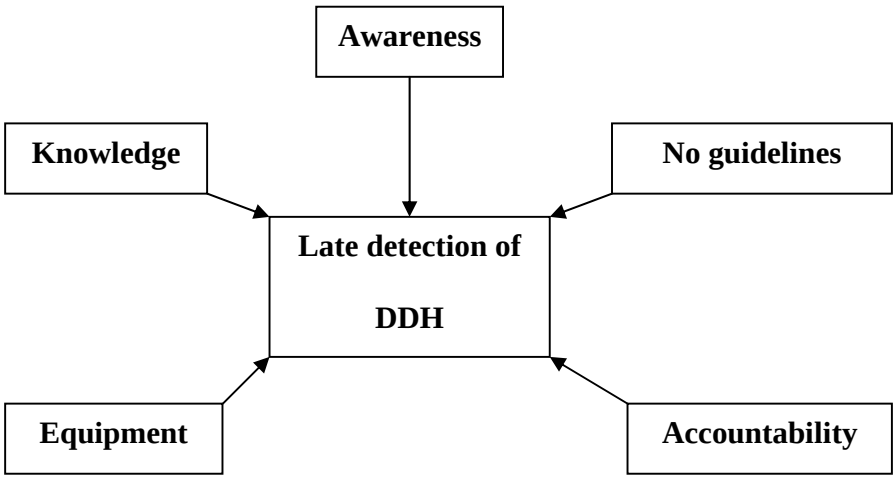
## Appendix 2. Indices of disability due to DDH in Armenia, 2003-2007.

2003-2007ÃÃ. ÁÝÃ ³ óùáõÙ µÝ ³ ÍÇÝ ÏáÝù ³ ½¹ñ ³ ÛÇÝ Ñá¹ ³ Ë ³ Ë ï Ç å ³ ï × ³ éáí ³ é ³ ç ³ ó ³ Í Ñ ³ ßÙ ³ Ý¹ ³ ÙáõÃÛáõÝÝ»ñÇ óáõó ³ ÝÇßÝ»ñ

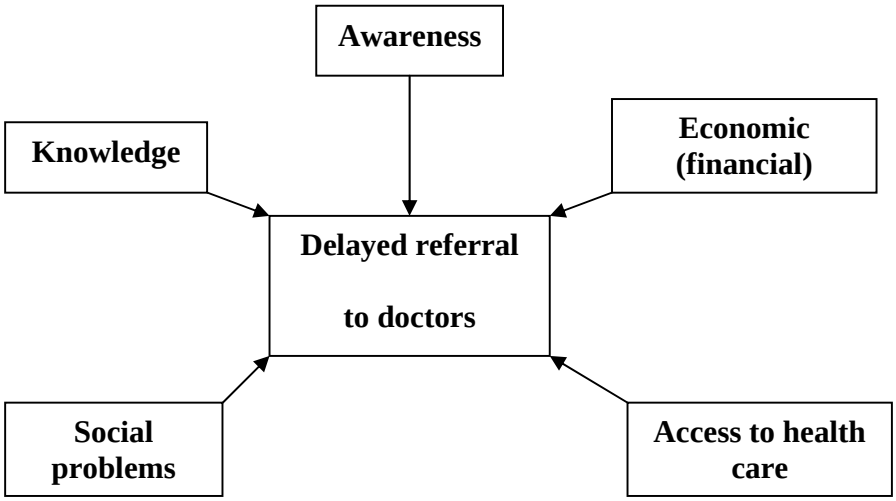
| î ³ ñ»ÃÇ í Á | ²é ³ çÝ ³ ÏÇ Ñ ³ ßÙ ³ Ý¹ ³ Ù × ³ Ý ³ ãí ³ ÍÝ»ñ | ÀÝ¹ ³ Ù»ÝÁ | ³ Û¹ Ãí áõÙ' »ñ»Ë ³ Ý»ñ | ³ Û¹ Ãí áõÙ' µÝ ³ ÍÇÝ Ñá¹ ³ Ë ³ Ë ï áí | Ð ³ ßÙ. »ñ»Ë ³ Ý»ñ ï »ë ³ Ï ³ ñ ³ ñ ÏßÇéÁ Ñ ³ ßÙ ³ Ý¹ ³ Ù × ³ Ý ³ ãí ³ ÍÝ»ñÇ Ù»ç | Ð ³ ßÙ. »ñ»Ë ³ Ý»ñ ï »ë ³ Ï ³ ñ ³ ñ ÏßÇéÁ Ñ ³ ßÙ ³ Ý¹ ³ Ù × ³ Ý ³ ãí ³ ÍÝ»ñÇ Ù»ç Áë ï ÑÇí . ¹ ³ ëÇ | Ð ³ ßÙ. »ñ»Ë ³ Ý»ñ ï »ë ³ Ï ³ ñ ³ ñ ÏßÇéÁ Ñ ³ ßÙ ³ Ý¹ ³ Ù × ³ Ý ³ ãí ³ ÍÝ»ñÇ Ù»ç Áë ï Ýá½áÉá · Ç ³ ÛÇ |
|---|---|---|---|---|---|---|---|
| 2003 | ÀÝ¹ ³ Ù»ÝÁ | 14346 | 1432 | - | 9,98% | - | - |
| | ³ Û¹ Ãí áõÙ` µÝ ³ ÍÇÝ ³ ÝÏ ³ ÝáÝáõÃÛáõÝÝ»ñ ½ ³ ñ · ³ óÙ ³ Ý ³ ñ ³ ï Ý»ñ ¨ Ó¨ ³ Ë ³ Ë ï áõÙ ³ ÛÇÝ ³ ñ ³ ï Ý»ñ | 214 | 89 | 21 | 41,59% | 9,81% | 23,60% |
| 2004 | ÀÝ¹ ³ Ù»ÝÁ | 13871 | 1218 | - | 8,78% | - | - |
| | ³ Û¹ Ãí áõÙ` µÝ ³ ÍÇÝ ³ ÝÏ ³ ÝáÝáõÃÛáõÝÝ»ñ ½ ³ ñ · ³ óÙ ³ Ý ³ ñ ³ ï Ý»ñ ¨ Ó¨ ³ Ë ³ Ë ï áõÙ ³ ÛÇÝ ³ ñ ³ ï Ý»ñ | 255 | 122 | 23 | 47,84% | 9,02% | 18,85% |
| 2005 | ÀÝ¹ ³ Ù»ÝÁ | 15751 | 1223 | - | 7,76% | - | - |
| | ³ Û¹ Ãí áõÙ` µÝ ³ ÍÇÝ ³ ÝÏ ³ ÝáÝáõÃÛáõÝÝ»ñ ½ ³ ñ · ³ óÙ ³ Ý ³ ñ ³ ï Ý»ñ ¨ Ó¨ ³ Ë ³ Ë ï áõÙ ³ ÛÇÝ ³ ñ ³ ï Ý»ñ | 310 | 157 | 19 | 50,65% | 6,13% | 12,10% |
| 2006 | ÀÝ¹ ³ Ù»ÝÁ | 15181 | 653 | - | 4,30% | - | - |
| | ³ Û¹ Ãí áõÙ` µÝ ³ ÍÇÝ ³ ÝÏ ³ ÝáÝáõÃÛáõÝÝ»ñ ½ ³ ñ · ³ óÙ ³ Ý ³ ñ ³ ï Ý»ñ ¨ Ó¨ ³ Ë ³ Ë ï áõÙ ³ ÛÇÝ ³ ñ ³ ï Ý»ñ | 231 | 78 | 17 | 33,77% | 7,36% | 21,79% |

## Appendix 3. Conceptual Framework.

**A. Hypothesized factors for doctors (neonatologists & pediatricians/FD).**




**B. Hypothesized factors for mothers.**


Awareness
Knowledge
Economic (financial)
Delayed referral to doctors
Social problems
Access to health care

## Appendix 4. Interview guide for doctors

### In-depth interview guide for doctors (English)

**Section 1.**

1. When did you graduate the Medical University?
2. How long have you practiced as a doctor?

**Section 2.**

1. Let's talk about congenital dislocation of the hip (CDH) in children.
    - In your opinion, how common/prevailing is it in Armenia?
    - How would you characterize the situation with CDH in Armenia.
2. Tell me, please, about causes of CDH.
    - In your opinion, what else can contribute to development of CDH in children?
3. Tell me, please, about CDH diagnosing.
    - Describe the means/ test for CDH diagnosis you use (or that exist) in your facility.
4. What is important for CDH diagnosis?
5. What do you usually do if you suspect CDH in a child?
6. Tell me about treatment/curability of CDH.
    - What can affect treatment results?
7. In your opinion, what consequences untreated CDH can has?
8. Do you consider CDH a public health problem and explain why?
    - Do you think, it is a problem that requires more attention?
9. What do you think should be done to improve management of CDH in Armenia?
10. In your opinion, what is the level of knowledge on CDH among Armenian doctors?
11. Do you think that our doctors need any training in this field?
    - What kind of training do they need?

Do you want to add something?

*Thank you for your participation and for your time*.

### In-depth interview guide for doctors (Armenian)

´ ³ÅÇÝ 1.

1. ºñµ »ù ³ í ³ ñ ï »É µÅßÏ ³ Ï ³ Ý Ñ ³ Ù ³ Éë ³ ñ ³ ÝÁ:
2. ø ³ ÝÇ ï ³ ñÇ »ù ³ ßË ³ ï áõÙ áñå »ë µÅßÇÏ:

´ ³ÅÇÝ 2.

1. ºÏ »ù Ëáë»Ýù »ñ»Ë ³ Ý»ñÇ Ùá ï ÏáÝù- ³ ½ ¹ ñ ³ ÍÇÝ Ñá ¹ Ç µÝ ³ ÍÇÝ Ñá ¹ ³ Ë ³ Ë ï Ç Ù ³ ëÇÝ:

- Ò»ñ Ï ³ ñÍÇùáí, áñù ³ Ýáí ¿ ³ Ûݠï ³ ñ ³ Í í ³ Í Ð ³ Û ³ ë ï ³ ÝáõÙ:
- ÆÝãå»ë ÏÝÏ ³ ñ ³ ·ñ»Çù ´Ð-Ç Çñ ³ íÇ× ³ ÏÁ Ð ³ Û ³ ë ï ³ ÝáõÙ:

2. ÆÝã Ï ³ ë»ù ´Ð-Ç å ³ ï × ³ éÝ»ñÇ Ù ³ ëÇÝ:
   - Ò»ñ Ï ³ ñÍÇùáí, ¿É ÇÝãÁ Ï ³ ñáÕ ¿ Ýå ³ ë ï »É ´Ð-Ç ½ ³ ñ· ³ óÙ ³ ÝÁ »ñ»Ë ³ Ý»ñÇ Ùá ï :
3. ä ³ ï Ù»ù ´Ð-Ç ¹Ç ³ ·Ýá½Ù ³ Ý Ù ³ ëÇÝ:
   - ÆÝãåÇëÇ ÙÇçáóÝ»ñ, ÑÝ ³ ñ ³ íáñáõÃÛáõÝÝ»ñ »ù û· ï ³ ·áñÍáõÙ Ï ³ Ù ·áÛáõÃÛáõÝ áõÝ»Ý Ó»ñ µáõÅÑ ³ ë ï ³ ï áõÃÛáõÝáõÙ ´Ð ¹Ç ³ ·Ýá½»Éáõ Ñ ³ Ù ³ ñ:
4. ÆÝãÁ ÏÏ ³ ñ¨áñ»Çù ´Ð ¹Ç ³ ·Ýá½»Éáõ Ñ ³ Ù ³ ñ:
5. ÆÝã ù ³ Û»ñ »ù Ó»éÝ ³ ñÏáõÙ »ñ»Ë ³ ÛÇ Ùá ï ´Ð Ï ³ ëÏ ³ Í»Éáõ ¹»åùáõÙ:
6. ä ³ ï Ù»ù, ËÝ¹ñáõÙ »Ù ´Ð-Ç µáõÅÙ ³ Ý ¨ µáõÅ»ÉÇáõÃÛ ³ Ý Ù ³ ëÇÝ:
   - ÆÝãÁ, Ò»ñ Ï ³ ñÍÇùáí, Ï ³ ñáÕ ¿ ³ ½¹»É µáõÅÙ ³ Ý ³ ñ¹ÛáõÝùÝ»ñÇ íñ ³ :
7. Ò»ñ Ï ³ ñÍÇùáí, ÇÝã Ñ» ï ¨ ³ ÝùÝ»ñ Ï ³ ñáÕ ¿ áõÝ»Ý ³ É ãµáõÅí ³ Í ´Ð-Á:
8. ¸áõù Ñ ³ Ù ³ ñáõÙ »ù ´Ð-Á Ñ ³ Ýñ ³ ÛÇÝ ³ éáÕÇáõÃÛ ³ Ý åñáµÉ»Ù: ´ ³ ó ³ ï ñ»ù Ò»ñ å ³ ï ³ ëË ³ ÝÁ:
   - Ò»ñ Ï ³ ñÍÇùáí ³ Ûë åñáµÉ»ÙÁ å ³ Ñ ³ ÝçáõÙ ¿ ³ í»ÉÇ ß ³ ï áõß ³ ¹ñáõÃÛáõÝ Ñ ³ ÝñáõÃÛ ³ Ý ÏáÕÙÇó:
9. Ò»ñ Ï ³ ñÍÇùáí, ÇÝã Ï ³ ñ»ÉÇ ¿ ³ Ý»É ´Ð-Ç Çñ ³ íÇ× ³ ÏÁ µ ³ ñ»É ³ í»Éáõ Ñ ³ Ù ³ ñ:
10. Ò»ñ Ï ³ ñÍÇùáí, ÇÝãåÇëÇÝ »Ý Ñ ³ Û µÅßÏÝ»ñÇ ·Ç ï »ÉÇùÝ»ñÁ ´Ð-Ç Ù ³ ëÇÝ:
11. ÆÝãå»ë »ù Ï ³ ñÍáõÙ, Ù»ñ µÅßÏÝ»ñÁ Ï ³ ñÇù áõÝ»Ý áñ¨¿ ¹ ³ ëÁÝÃ ³ óÝ»ñÇ Ï ³ Ù í»ñ ³ å ³ ï ñ ³ ë ï Ù ³ Ý ³ Ûë áÉáñ ï áõÙ:
    - ÆÝãåÇëÇ í»ñ ³ å ³ ï ñ ³ ë ï Ù ³ Ý Ï ³ ñÇù Ýñ ³ Ýù áõÝ»Ý:

    ò ³ ÝÏ ³ ÝáõÙ »ù áñ¨¿ µ ³ Ý ³ í»É ³ óÝ»É:

*ÞÝáñÑ ³ Ï ³ ÉáõÃÛáõÝ Ò»ñ Ù ³ ëÝ ³ ÏóáõÃÛ ³ Ý ¨ ï ñ ³ Ù ³ ¹ñ ³ Í Å ³ Ù ³ Ý ³ ÏÇ Ñ ³ Ù ³ ñ:*

## Appendix 5. Interview guide for mothers.

**In-depth interview guide for mothers (English)**

**Section 1.**

1. How many children do you have? How many of them have CDH?
2. Did you deliver in hospital?
    a. Did you have normal pregnancy/delivery?
3. Is there family history of CDH in your family?

**Section 2.**

1. What education did you get?
2. What did you know about CDH before it was diagnosed in your child? What do you know now about it?
3. At what age was CDH diagnosed in your child and where the diagnosis was confirmed?
4. After diagnosis, when did you start the treatment?
   - Were there any obstacles to start treatment immediately after diagnosis?
5. Do you visit polyclinic regularly?
   - Did pediatrician examine your child before the diagnosis of CDH?
6. During your visits to polyclinic for regular checkups, was your child examined by surgeon, orthopedist or neuropathologist.
   - Did they suspect something?
7. Did you practice swaddling and how long?
8. In your opinion what are the reasons for delayed diagnosis of CDH?
9. Do you consider CDH a public health problem and explain why?
   - Do you think that more attention should be paid to this problem?
10. What do you think should be done to improve management of CDH in Armenia?

Do you want to add something?

*Thank you for your participation and for your time.*

**In-depth interview guide for mothers (Armenian)**

´ ³ ÅÇÝ 1.

1. ø ³ ÝÇ »ñ»Ë ³ áõÝ»ù: ø ³ ÝÇëÝ »Ý ï ³ é ³ åáõÙ ´Ð-á í:
2. ¸áõù ÍÝÝ ¹ ³ µ»ñ»É »ù ÍÝÝ ¹ ³ ï ³ ÝÁ:
3. Ì ÝÝ ¹ ³ µ»ñáõÃÛáõÝÁ/ÑÕÇáõÃÛáõÝÁ ÁÝÃ ³ ó»É »Ý ÝáñÙ ³ É:
4. Ò»ñ ÁÝ ï ³ ÝÇùáõÙ Ï ³ ´Ð-Ç Å ³ é ³ Ý · ³ Ï ³ ÝáõÃÛáõÝ:
5. ÆÝã ÏñÃáõÃÛáõÝ »ù ë ï ³ ó»É:

´ ³ ÅÇÝ 2.

1. ÆÝã ·Ç ï »Çù ´Ð-Ç Ù ³ ëÇÝ ÙÇÝã¨ Ó»ñ »ñ»Ë ³ ÛÇ Ùá ï ³ ÛÝ ³ Ë ï áñáß í »ÉÁ: ÆÝã ·Ç ï »ù ÑÇÙ ³ :

2. àñ ï ³ ñÇùáõÙ ¿ ³ Ë ï áñáßí »É ´Ð Ò»ñ »ñ»Ë ³ Û Çá ï ¨ áñ ï »Õ:
3. ² Ë ï áñáßí »Éáõó Ñ» ï á, »ñµ »ù ëÏë»É µáõÅáõÙÁ:
   - Î ³ ÛÇÝ ³ ñ¹ Ûáù å ³ ï × ³ éÝ»ñ Ñ» ï ³ Ó · »Éáõ µáõÅáõÙÁ:
4. ¸ áõù ³ Ûó»É»É »ù å ûÉÇÏÉÇÝÇÏ ³ :
   - ØÇÝã¨ ´Ð ¹Ç ³ · Ýá½»ÉÁ Ò»ñ »ñ»Ë ³ ÛÇÝ ½ÝÝ»É ¿ñ Ù ³ ÝÏ ³ µáõÛÅÁ:
5. äáÉÇÏÉÇÝÇÏ ³ ³ Ûó»É»ÉÇë ½ÝÝ»É ¿ ³ ñ¹ Ûáù Ò»ñ »ñ»Ë ³ ÛÇÝ Ù ³ ÝÏ ³ Ï ³ Ý íÇñ ³ µáõÛÅÁ, ûñÃáå »¹ Á Ï ³ Ù Ý¨ ñáå ³ ÃáÉá · Á:
   - Üñ ³ Ýù áñ¨Çó» µ ³ Ý Ï ³ ëÏ ³ Í »É »Ý:
6. ´ ³ ñáõñ»É »ù Ò»ñ µ ³ ÉÇÏÇÝ ¨ áñù ³ Ý Å ³ Ù ³ Ý ³ Ï:
7. Ò»ñ Ï ³ ñÍÇùá í, áñáÝù »Ý ´Ð-Ç áõß ³ Ë ï áñáßÙ ³ Ý å ³ ï × ³ éÝ»ñÁ:
8. ¸ áõù Ñ ³ Ù ³ ñáõÙ »ù ´Ð-Á Ñ ³ Ýñ ³ ÛÇÝ ³ éáÕçáõÃÛ ³ Ý åñáµÉ»Ù: ´ ³ ó ³ ï ñ»ù Ò»ñ å ³ ï ³ ëË ³ ÝÁ:
   - Ò»ñ Ï ³ ñÍÇùá í ³ Ûë åñáµÉ»ÙÁ å ³ Ñ ³ ÝçáõÙ ¿ ³ í »ÉÇ ß ³ ï áõß ³ ¹ñáõÃÛáõÝ Ñ ³ ÝñáõÃÛ ³ Ý ÏáÕÙÇó:
9. Ò»ñ Ï ³ ñÍÇùá í, ÇÝã Ï ³ ñ»ÉÇ ¿ ³ Ý»É ´Ð-Ç Çñ ³ íÇ× ³ ÏÁ µ ³ ñ»É ³ í »Éáõ Ñ ³ Ù ³ ñ:

ò ³ ÝÏ ³ Ýáõ Ù »ù á ñ¨¿ µ ³ Ý ³ í »É ³ óÝ»É:

*ÞÝáñÑ ³ Ï ³ ÉáõÃÛáõÝ Ò»ñ Ù ³ ëÝ ³ ÏóáõÃÛ ³ Ý ¨ ï ñ ³ Ù ³ ¹ñ ³ Í Å ³ Ù ³ Ý ³ ÏÇ Ñ ³ Ù ³ ñ:*

## Appendix 6. Consent forms

### American University Of Armenia
### Institutional Review Board # 1/Committee On Human Research
### College Of Health Sciences Subcommittee For Student Theses

**CONSENT FORM (1)**
**for doctors**

Title of Research Project:

**Investigation of Obstacles to Early Detection of Developmental Dysplasia of the Hip**

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Explanation of Research Project:

Hello, I am Marina Tiroyan. I am a student of the Public Health Program at the American University of Armenia. This is a research project, which is studying neonetologists' and pediatricians/family physicians' attitude and approach in regards to congenital dislocation of the hip.

You are invited to contribute to this study because you are a neonatologist (pediatrician or family physician). You are asked to participate in an interview, which will take about 40 minutes.

If you do not mind, I will take notes during the interview in order not to lose any information.

There is no risk for you as a participant in this study. You will not receive any benefit from the participation. Your personal experience and participation could make a valuable input for this study. The only inconvenience will be your time spent on interview.

Your participation in the study is voluntary. You have the right not to participate or drop out from the interview anytime. Your decision will not affect you or your job.

All the information will be kept confidential. Only researcher will have access to data. Any information that may identify you is not required. The collected information will be reported only as aggregate data. All the data will be stored for 3 years and then destroyed.

If you have any questions about the study or interview you can contact me **Marina Tiroyan 010 62 46 20.**

If you believe that you have not been treated fairly, you may contact **Dr. Yelena Amirkhanyan at the AUA at 51 25 68.**

## American University Of Armenia
## Institutional Review Board # 1/Committee On Human Research
## College Of Health Sciences Subcommittee For Student Theses

### CONSENT FORM (2)
### for mothers

Title of Research Project:

**Investigation of Obstacles to Early Detection of Developmental Dysplasia of the Hip**

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Explanation of Research Project:

Hello, I am Marina Tiroyan. I am a student of the Public Health Program at the American University of Armenia. This is a research project, which is studying doctors' and mothers' attitude and approach in regards to congenital dislocation of the hip.

You are invited to contribute to this study because your child was diagnosed with congenital dislocation of the hip. You are asked to participate in an interview, which will take about 40 minutes. If you do not mind, I will take notes during the interview in order not to lose any information.

There is no risk for you as a participant in this study. You will not receive any benefit from the participation. Your personal experience and participation could make a valuable input for this study. The only inconvenience will be your time spent on interview.

Your participation in the study is voluntary. You have the right not to participate or drop out from the interview anytime. Your decision will not affect you or your child followed treatment.

All the information will be kept confidential. Only researcher will have access to data. Any information that may identify you is not required. The collected information will be reported only as aggregate data. All the data will be stored for 3 years and then destroyed.

If you have any questions about the study or interview you can contact me **Marina Tiroyan 62 46 20.**

If you believe that you have not been treated fairly, you may contact **Dr. Yelena Amirkhanyan at the AUA at 51 25 68.**

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Ð³Û³ëï³ÝÇ²Ù»ñÇÏÛ³ÝÐ³Ù³Éë³ñ³Ý
Ð³Ýñ³ÛÇÝ²éáÕç³å³ÑáõÃÛ³Ýü³ÏáõÉï»ï

**Ð³Ù³Ó³ÛÝáõÃÛáõÝ (1)**
**Բժշկների համար**

**ÎáÝù-³½¹ñ³ÛÇÝ Ñá¹Ç½³ñ·³óáÕ ¹Çëå É³½Ç³ÛÇ áõß³Ë ï áñáßÙ³Ý å³ï×³éÝ»ñÇ Ñ»ï³½áïáõÙ**

´³ñ¨Ò»½: ºë, Ø³ñÇÝ³ îÇñáÛ³ÝÝ»Ù ª Ð³Û³ëï³ÝÇ³Ù»ñÇÏÛ³Ý Ñ³Ù³Éë³ñ³ÝÇ Ð³Ýñ³ÛÇÝ³éáÕç³å³ÑáõÃÛ³Ýü³ÏáõÉï»ïÇ áõë³ÝáÕ: ²Ûë Ñ»ï³½áïáõÃÛáõÝÁ áõëáõÙÝ³ëÇñáõÙ ¿ Ý»áÝ³ï áÉá·Ý»ñÇ¨ Ù³ÝÏ³µáõÛÅÝ»ñÇ/ÁÝï³Ý»Ï³Ý µÅßÏÝ»ñÇ í»ñ³µ»ñÙáõÝùÝ áõ Ùáï»óáõÙÁ ÏáÝù-³½¹ñ³ÛÇÝ Ñá¹Ç µÝ³ÍÇÝ Ñá¹³Ë³Ëï Ç í»ñ³µ»ñÛ³É:

¸áõù Ñ³íÇñí»É »ù Ù³ëÝ³Ïó»Éáõ ³Ûë Ñ»ï³½áïáõÃÛ³ÝÁ, áñáíÑ»ï¨ ¸áõù Ý»áÝ³ï áÉá·»ù (Ù³ÝÏ³µáõÅ/ ÁÝï³Ý»Ï³Ý µÅÇßÏ): Ò»½³ÝÇó ËÝ¹ñíáõÙ ¿ Ù³ëÝ³Ïó»É Ñ³ñó³½ñáõÛóÇ, áñÁ Ï ï¨Ç Ùáï³íáñ³å»ë 40 ñáå»: ºÃ» ¹»Ù ã»ù, »ë Ñ³ñó³½ñáõÛóÇ ÁÝÃ³óùáõÙ ·ñ³éáõÙÝ»ñ Ï³Ý»Ù, áñå»ë½Ç áñ¨¿ ï»Õ»Ï³ï íáõÃÛáõÝ ãÏáñÇ:

¸áõù ³ÝÓ³Ùµ áñ¨¿ û·áõ ï Ï³Ù íÝ³ë ã»ù áõÝ»Ý³ ³Ûë Ñ»ï³½áï áõÃÛáõÝÇó: Ò»ñ ÷áñÓÝ áõ Ù³ëÝ³ÏóáõÃÛáõÝÁ ß³ï ³ñÅ»ù³íáñ »Ý ³Ûë Ñ»ï³½áï áõÃÛ³Ý Ñ³Ù³ñ: ²ÛÝ Ò»½³ÝÇó Ï å³Ñ³ÝçÇ ÙÇ³ÛÝ Å³Ù³Ý³Ï:

Ø³ëÝ³ÏóáõÃÛáõÝÁ ³Ûë Ñ»ï³½áï áõÃÛáõÝáõÙ Ï³Ù³íáñ¿: ¸áõù Ï³ñáÕ »ù Ññ³Å³ñí»É Ù³ëÝ³ÏóáõÃÛáõÝÇó Ï³Ù ¿É ÁÝ¹Ñ³ï»É ³ÛÝ ó³ÝÏ³ó³Í å³ÑÇÝ: Ò»ñ áñáßáõÙÁ áã ÙÇ Ï»ñå ãÇ ³Ýñ³¹³éÝ³ Ò»ñ Ï³Ù Ò»ñ ³ßË³ï³ÝùÇ íñ³:

²ÙµáÕç ë ï ³óí³Í ï»Õ»ÏáõÃÛáõÝÝ»ñÁ Ù³ï ã»ÉÇ »Ý ÉÇÝ»Éáõ ÙÇ³ÛÝ Ñ»ï³½áï áõÇÝ, û·ï³·áñÍ í»Éáõ »Ý ÙÇ³Ý³Ûë Ñ»ï³½áï áõÃÛ³Ý Ñ³Ù³ñ¨ Ï å³Ñí»Ý ·³Õï ÝÇ: Ò»ñ³ÝÓÁ å³ñ½»Éáõ áñ¨¿ ï»Õ»ÏáõÃÛáõÝ ãÇ å³Ñ³Ýçíáõù: ¼»ÏáõÛóáõÙ

Ýßí»Éáõ »Ý ÙÇ ³ÛÝ ³Ù÷á÷ ï íÛ³ÉÝ»ñ: ê ï ³óí ³ Í ï »Õ»ÏáõÃÛáõÝÝ»ñÁ Ï å ³Ñå ³Ýí»Ý ³ÝÓ»éÝÙË»ÉÇ 3 ï ³ñí ³ ÁÝÃ³óùáõÙ, áñÇó Ñ» ï á ÏáãÝã ³ óí»Ý:

ºÃ» ¸áõù áñ¨ù Ñ³ñó»ñ áõÝ»ù Ñ» ï ³½á ï áõÃÛ³Ý Ï ³Ý Ñ³ñó³½ñáõÛóÇ í»ñ³µ»ñÛ³É Ï ³ñáÕ »ù ¹ÇÙ»É Ø³ñÇÝ³ îÇñáÛ³ÝÇÝ` Ñ» ï ¨Û³É Ñ»é³ Ëáë³Ñ³Ù³ñáí 62 46 20.

ºÃ» ¸áõù Ñ³Ù³ñ»ù, áñ Ò»ñ ÝÏ ³ ï Ù³Ùµ ³Ý³ñ¹³ ñ í»ñ³µ»ñÙáõÝù ¿ óáõó³µ»ñí»É, Ï ³ñáÕ »ù ¹ÇÙ»É Ð²Ð ºÉ»Ý³ ²ÙÇñË³ÝÛ³ÝÇÝ` Ñ» ï ¨Û³É Ñ»é³ Ëáë³Ñ³Ù³ñáí 51 25 68:

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## Ð³Û³ë ï ³ÝÇ ²Ù»ñÇÏÛ³Ý Ð³Ù³Éë³ñ³Ý
Ð³Ýñ³ÛÇÝ ²éáÕç³å³ÑáõÃÛ³Ý ü³ÏáõÉ ï» ï

## Ð³Ù³Ó³ÛÝáõÃÛáõÝ (2)
**Մայրերի համար**

### Îáÿù-³½¹ñ³ÛÇÝ Ñá¹Ç½³ñ·³óáÕ ¹ÇëåÉ³½Ç³ÛÇ áõß³Ë ï áñáßÙ³Ý å³ ï×³éÝ»ñÇ Ñ» ï ³½á ï áõÃÛáõÝ

´³ñ¨ Ò»½: ºë, Ø³ñÇÝ³ îÇñáÛ³ÝÝ »Ù ª Ð³Û³ë ï ³ÝÇ ³Ù»ñÇÏÛ³Ý Ñ³Ù³Éë³ñ³ÝÇ Ð³Ýñ³ÛÇÝ ³éáÕç³å³ÑáõÃÛ³Ý ü³ÏáõÉ ï» ï Ç áõë³ÝáÕ: ²Ûë Ñ» ï ³½á ï áõÃÛáõÝÁ áõëáõÙÝ³ëÇñáõÙ ¿ µÅßÏÝ»ñÇ ¨Ù³Ûñ»ñÇ í»ñ³µ»ñÙáõÝùÝ áõ Ùá ï »óáõÙÁ ÏáÝù-³½¹ñ³ÛÇÝ Ñá¹Ç µÝ³ÍÇÝ Ñá¹³Ë³Ë ï Ç í»ñ³µ»ñÛ³É:

¸áõù Ññ³íÇñí»É »ù Ù³ëÝ³ Ïó»Éáõ ³Ûë Ñ» ï ³½á ï áõÃÛ³ÝÁ, áñá íÑ» ï ¨ Ò»ñ »ñ»Ë³ÛÇ Ùá ï ³Ë ï áñáßí»É¿ µÝ³ÍÇÝ Ñá¹³Ë³Ë ï : Ò»½³ÝÇó ËÝ¹ñáõÙ¿ Ù³ëÝ³ Ïó»É Ñ³ñó³½ñáõÛóÇ, áñÁ Ï ï ¨Ç Ùá ï ³ íáñ³å»ë 40 ñáå»: ºÃ» ¹»Ù ã»ù, »ë Ñ³ñó³½ñáõÛóÇ ÁÝÃ³óùáõÙ ·ñ³éáõÙÝ»ñ Ï³Ý»Ù, áñå»ë½Ç áñ¨¿ ï »Õ»Ï³ ï íáõÃÛáõÝ ãÏáñÇ:

¸áõù ³ÝÓ³Ùµ Ï³Ù Ò»ñ »ñ»Ë³Ý áñ¨¿ û·áõ ï Ï³Ù íÝ³ë ã»ù áõÝ»Ý³ ³Ûë Ñ» ï ³½á ï áõÃÛáõÝÇó: Ò»ñ ÷áñÓÝ áõ Ù³ëÝ³ ÏóáõÃÛáõÝÁ ß³ ï ³ñÅ»ù³ íáñ »Ý ³Ûë Ñ» ï ³½á ï áõÃÛ³Ý Ñ³Ù³ñ: ²ÛÝ Ò»½³ÝÇó Ï å ³Ñ³ÝçÇ ÙÇ³ÛÝ Å³Ù³Ý³ Ï:

Ø³ëÝ³ ÏóáõÃÛáõÝÁ ³Ûë Ñ» ï ³½á ï áõÃÛáõÝáõÙ Ï³Ù³ íáñ¿: ¸áõù Ï³ñáÕ »ù Ññ³Å³ñí»É Ù³ëÝ³ ÏóáõÃÛáõÝÇó Ï³Ù ¿É ÁÝ¹Ñ³ ï»É ³ÛÝ ó³ÝÏ³ó³Í å³ÑÇÝ: Ò»ñ áñáßáõÙÁ áã ÙÇ Ï»ñå ãÇ ³Ýñ³¹³éÝ³ Ò»ñ íñ³ Ï³Ù Ò»ñ »ñ»Ë³ÛÇ Ñ» ï ³·³ µáõÅÙ³Ý íñ³:

²ÙµáÕç ë ï ³óí³Í ï »Õ»ÏáõÃÛáõÝÝ»ñÁ Ù³ ï ã»ÉÇ »Ý ÉÇÝ»Éáõ ÙÇ³ÛÝ Ñ» ï ³½á ï áÕÇÝ, û· ï ³·áñÍ í»Éáõ »Ý ÙÇ³Ý ³Ûë Ñ» ï ³½á ï áõÃÛ³Ý Ñ³Ù³ñ¨ Ï å³Ñí»Ý ·³Õ ï ÝÇ: Ò»ñ Ï³Ù Ò»ñ »ñ»Ë³ÛÇ ³ÝÓÁ å³ñ½»Éáõ áñ¨¿ ï »Õ»ÏáõÃÛáõÝ ãÇ å³Ñ³Ýç íáõÙ: ¼»ÏáõÛóáõÙ Ýßí»Éáõ »Ý ÙÇ³ÛÝ ³Ù÷á÷ ï íÛ³ÉÝ»ñ: ê ï ³óí³Í ï »Õ»ÏáõÃÛáõÝÝ»ñÁ Ï å³Ñå³Ýí»Ý ³ÝÓ»éÝÙË»ÉÇ 3 ï ³ñí³ ÁÝÃ³óùáõÙ, áñÇó Ñ» ï á ÏáãÝã³óí»Ý:

ºÃ» ¸áõù áñ¨ù Ñ³ñó»ñ áõÝ»ù Ñ» ï ³½á ï áõÃÛ³Ý Ï³Ý Ñ³ñó³½ñáõÛóÇ í»ñ³µ»ñÛ³É Ï³ñáÕ »ù ¹ÇÙ»É **Ø³ñÇÝ³ îÇñáÛ³ÝÇÝ`** Ñ» ï ¨Û³É Ñ»é³ Ëáë³Ñ³Ù³ñáí **62 46 20.**

ºÃ» ¸áõù Ñ³Ù³ñ»ù, áñ Ò»ñ ÝÏ³ ï Ù³Ùµ ³Ý³ñ¹³ñ í»ñ³µ»ñÙáõÝù ¿ óáõóáµ»ñí»É, Ï³ñáÕ »ù ¹ÇÙ»É Ð²Ð ºÉ»Ý³ ²ÙÇñË³Ý Û³ÝÇÝ` Ñ» ï ¨Û³É Ñ»é³ Ëáë³Ñ³Ù³ñáí **51 25 68**: