Artigo Original

Using the Swiss ball in labor*

Uso da bola suíça no trabalho de parto

Uso de la pelota suiza en el trabajo de parto

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ABSTRACT

Objectives: To characterize the use of the Swiss ball for the care of laboring women in obstetric care services linked to the Unified Health System in São Paulo, and to identify the characteristics of its use in assisting laboring women by nurse-midwives. **Methods:** A descriptive study based on structured interviews with 35 nurses who were providing assistance to laboring women. **Results:** We found that 100% of Normal Birthing Centers and 40.9% of obstetric centers owned the Swiss ball. The indications for the use of Swiss ball were: promoting fetal descent (32.4%), relaxation (19.7%), progression of labor (17.1%), exercise of the perineum (14.5%), pain relief (11.8%), psychological benefits and maternal movement. Nearly all of the institutions visited (96.8%) had no protocol for its use. **Conclusion:** The study found that nurses ascribe benefits to using the Swiss ball during labor. Clinical trials are needed to evaluate its effects and support the development of guidelines for its use.

Keywords: Obstetrical nursing; Exercise therapy; Natural childbirth

RESUMO

Objetivos: Caracterizar o uso da bola suíça na assistência à parturiente em serviços de atenção obstétrica vinculado ao Sistema Único de Saúde no Município de São Paulo e identificar as características de seu emprego na assistência à parturiente por enfermeira obstétricas. **Métodos:** Estudo descritivo com base em entrevistas estruturadas com 35 enfermeiras que prestavam assistência às parturientes. **Resultados:** Constatou-se que 100% dos Centros de Parto Normal e 40,9% dos Centros Obstétricos possuiam bola suíça. As indicações do uso da bola suíça foram: promover a descida da apresentação fetal (32,4%), relaxamento (19,7%), progressão do parto (17,1%), exercício do períneo (14,5%), alívio da dor (11,8%), benefícios psicológicos e movimentação materna. A quase totalidade das instituições visitadas (96,8%) não possuia protocolo para sua utilização. **Conclusão:** O estudo apontou que as enfermeiras atribuem benefícios ao uso da bola suíça no trabalho de parto. Ensaios clínicos são necessários para avaliar seus efeitos e subsidiar a elaboração de orientações para seu uso.

Descritores: Enfermagem obstétrica; Terapia por exercício; Parto normal

RESUMEN

Objetivos: Caracterizar el uso de la pelota suiza en la asistencia a la parturienta en servicios de atención obstétrica vinculado al Sistema Único de Salud en el Municipio de Sao Paulo e identificar las características de su empleo en la asistencia de la parturienta por enfermeras obstétricas. **Métodos:** Estudio descriptivo a partir de entrevistas estructuradas realizadas a 35 enfermeras que prestaban asistencia a las parturientas. **Resultados:** Se constató que el 100% de los Centros de Parto Normal y 40,9% de los Centros Obstétricos poseían la pelota suiza. Las indicaciones del uso de la pelota suiza fueron: promover el descenso de la presentación fetal (32,4%), relajamiento (19,7%), progresión del parto (17,1%), ejercicio del periné (14,5%), alivio del dolor (11,8%), beneficios psicológicos y movimiento materno. La casi totalidad de las instituciones visitadas (96,8%) no poseía protocolo para su utilización. **Conclusión:** En el estudio se señaló que las enfermeras atribuyen beneficios al uso de la pelota suiza en el trabajo de parto. Los ensayos clínicos son necesarios para evaluar sus efectos y subsidiar la elaboración de orientaciones para su uso.

Descriptores: Enfermería obstétrica; Terapia por ejercicio; Parto normal

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INTRODUCTION

Enhancing the comfort and satisfaction of women giving birth figures among care providers' most important tasks. Practices with this goal are part of a contact marked by the valuation of physiological birth and the adequate use of labor and birth care technologies, which range from modifications in labor care environments to the use of non-pharmacological practices for labor pain relief; these cause less side effects for mothers and infants and can grant women a greater feeling of control while giving birth. In-hospital environments with adequate architectonic aspects and furniture contribute to enhance feelings of calmness, control and freedom to move. Women who gave birth at these locations have displayed higher satisfaction levels, decreased use of medical interventions and greater probability of spontaneous delivery[1].

Among non-pharmacological practices, the use of acupuncture, acupressure, hypnosis, relaxation and breathing techniques, cold and heat application, aromatherapy, audioanalgesia, massage and immersion bath during labor have been studied[2-6]. Stimulating walking and active postures during labor also constitutes a comfort strategy and is associated with shorter delivery times, without harmful repercussions for mothers and infants[7].

The vertical posture and movements can reduce maternal pain, facilitate maternal-fetal circulation and fetal descent in the maternal pelvis, improve uterine contractions and decrease perineal trauma, which is why the influence of maternal posture changes during delivery has been a topic of research interest for many decades[8]. The Swiss ball is one of the strategies to enhance women's free movements while giving birth.

In 1963, the so-called "Stability ball" was developed in Italy as a child toy, and started being used for rehabilitation purposes involving children with neurological impairments in Switzerland[9-11]. That is when North American therapists started calling it the "Swiss ball". In the 1970's, it gained strength as a result of its use in rehabilitation after postural and neurological problems[10-12]. The first records about the use of the ball in Obstetrics appeared in the 1980's, at a German maternity, where midwives offered to birthing women, in order to support labor progression. These midwives believed that it helped with the descent and rotation of the fetal presenting part[10].

The Swiss ball is also known as the bobath ball, gym ball, birth ball, fit ball, ballness, prana ball, pezzi ball, stability balls, exercise balls, physio-balls, among other terms. This resource stimulates the vertical position, grants freedom to adopt different positions and permits the pelvic balance exercise due to its toy nature, which entails psychological benefits, besides its low cost.

The main benefits of Swiss ball exercises during pregnancy and labor include postural correction, relaxation and stretching and muscle strengthening. Ball exercise in the vertical (sitting) position train pelvic floor muscles, especially the levator ani and pubococcygeus muscles and pelvic fascia[9]. This position also grants parturient women freedom to change position, which contributes to their active participation in the birth process[13-15]. Light pelvic movements enhance muscle relaxation which, associated with the expansion of the pelvis, helps with the fetal presenting part's descent through the birth canal[10,16-18].

Available scientific literature on the use of the Swiss ball during labor is considered scarce. Experiments appoint, though, that its use fits into the context of public birth care policies in Brazil[14-15,19-25]. Health professionals and researchers increasingly take interest in this practice, despite the lack of a consensus on its use.

Thus, the present research goals were to characterize the use of the Swiss ball in women's health care during labor at obstetric care services affiliated with the Brazilian Health System in São Paulo City and to identify the characteristics of nurse-midwives' use of this resource in parturient care.

METHODS

Descriptive study with a quantitative approach on nurse-midwives' use of the Swiss ball during labor care at obstetric care services affiliated with the Brazilian Health System (SUS – Sistema Único de Saúde) in São Paulo City. These services were identified through the São Paulo Municipal Health Secretariat's National Register of Health Establishments. Out of 37 registered services, data were collected at 35 institutions, as two hospitals did not authorize data collection.

The study population consisted of nurses active in parturient care at public maternities in São Paulo City. At each institution, one parturient care nurse was interviewed. Data were collected between August 2009 and January 2010.

Study variables were chosen in the attempt to describe the frequency and reasons for using the ball during labor. Data were collected through structured interviews with 35 nurse-midwives, using a specific form. Statistical analysis was developed in SPSS version 16. Relative and absolute frequencies were used for descriptive data analysis. Approval for the research project was obtained from the Institutional Review Board of the São Paulo Municipal Health Secretariat (Number 153/09).

The parturient care nurses received the Informed Consent Term (ICT) with information about the study, to be signed if they agreed to participate. They were informed about the voluntary nature of their participation

and the freedom to withdraw from the research at any time. Two copies of the Request for Authorization to Develop the Research and the ICT were printed, one for the professionals and the other for the researcher.

RESULTS

The obstetric services were located in the following regions: South, 12 units (32.5%); East, nine units (24.3%); West, five units (13.5%); North, five units (13.5%) and Southeast and Center, with three units each (8.1%).

Regarding the units' characteristics, at most maternities (62.9%), labor care is delivered at the obstetric center. The remainder (37.1%) are Birth Centers (BC), from which 31.4% are in-hospital, 2.9% alongside and 2.9% freestanding units.

Up to 400 deliveries occurred per month at almost all (94.3%) institutions. At only two larger institutions, representing 5.7% of the maternities, more than 400 births happened per month. Normal birth percentages at the different birth care locations varied in terms of care models. At the in-hospital BC, normal birth frequencies varied between 65.5% and 80%. At the Obstetric Centers (OC), the range of variation in normal birth percentages was wider, varying between 30% and 90% of all births. Among the 35 research institutions, at 19 (54.3%) services, the nurse-midwife was responsible for normal births. It should be observed that, at the 16 (45.7%) institutions where physicians were responsible for normal birth, nurses delivered labor care. According to the figures, all BC had at least one Swiss ball, while ten had two or more (Table 1). Most OC, on the other hand, did not have a ball (59.1%).

Table 1 – Use of the Swiss ball according to place of care at 35 public maternities in São Paulo City – from 08/2009 till 01/2010

Place	Yes		No		Total	
	n.º	%	n.º	%	n.º	%
Obstetric Center	9	40.9	13	59.1	22	62.9
Normal Birth Center	13	100.0	-	-	13	37.1
Total	22	62.9	13	37.1	35	100.0

In response to questions on Swiss ball use, out of 35 interviewed nurses, 4 (11.4%) reported no knowledge on or experience with this practice in their professional career, and informed using other non-pharmacological methods in parturient care, such as: aspersion bath and rocking chair.

Among the 31 nurses who affirmed they knew about the use of the Swiss ball, 9 (29%) denied they had gained this experience in their current job, but knew about it from another job. Most respondents (36.5%) indicated the sitting position with support. The option without support was not mentioned. Regarding the types of movements, 31.8% of answers referred to the propulsion movement (lowers and lifts) of the ball and almost the same percentage (30.5%) was related to the adopted to rotating hip movements. Only one of the interviewees mentioned that she indicated the kneeling position supported by the ball.

As for the time of stay on the ball, 2 nurses (77.5%) affirmed they advised the parturient to stay on the ball for one hour. Less nurses (5–16.1%) answered that they indicated the duration the parturient woman managed to stay on the ball. The final two answers mentioned an intermittent one-hour sequence and 30 minutes of stay.

Concerning the moment in labor when the ball is used, the interviewees' answers ranged from 4 to 7 cm; the majority (54.8%) indicated it when the parturient reaches 4 cm of cervical dilation. Regarding the indications for using the ball, the most frequent answers were: to help with the descent of the fetal presenting part (34.8%), followed by to enhance relaxation (24.2%) and to relieve pain (15.1%) (Table 2). Less frequent answers included indications to help with the progression of labor (13.6%), to stimulate movements (7.6%) and to help exercise the perineal region, with 4.5% of answers.

Table 2 – Nurses' answers according to indications for Swiss ball use at 31 public maternities in São Paulo City – from 08/2009 till 01/2010

Indication	n.º	%
Help with descent of fetal presenting part	23	34.8
Help with relaxation	16	24.2
Pain relief	10	15.1
Slow progress of labor	9	13.6
Stimulation to move	5	7.6
Exercise for the perineal region	3	4.5
Total	66	100

Most frequent answers (37.8%) to contraindicate the ball referred to the existence of obstetric problems: pregnancy induced hypertension or placental abruption, followed by 16.2% in case the woman is a multipara. On the other hand, 13.5% of the nurses answered that they do not contraindicate the ball in any situation. Out of 31 nurses who mentioned experience with the ball, four reported that they do not associate it with other non-pharmacological practices during labor. Among participants who gave positive answers, 54.5% concomitantly used the ball and aspersion bath, 42.4% with massage and 3.0% with correct breathing orientations.

The effects of ball use, although observed by the nurses, in a non-systematic way, were more numerous when compared with indications. About one-third of

the obtained answers (32.9%) referred to help with the descent and station of the fetal presenting part. Other frequent answers mentioned that ball use was associated with relaxation (19.7%), labor progression (17.1%), perineal exercise (14.5%) and pain relief (11.8%) (Table 3). Other observed effects were help with cervical dilation and psychological benefits, although these were not appointed as indications. All nurses affirmed that they had not observed vulvar or perinea edema formation after ball use when they were asked about these adverse effects.

Table 3 – Nurses' answers on observed effects when using Swiss ball at 31 public maternities in São Paulo City – from 08/2009 till 01/2010

Effects	n.º	%
Helps with descent and station of the fetal presenting part	25	32.9
Helps with relaxation of parturient	15	19.7
Helps with labor progression	13	17.1
Exercises the perineal region	11	14.5
Relieves pain	9	11.8
Helps with cervical dilation	1	1.3
Psychological benefits	1	1.3
Enhances maternal movements	1	1.3
Total	76	100

All participants reported that the parturients' acceptance of the Swiss ball is excellent and good. Nevertheless, 19.4% affirmed they experienced some difficulty to put this in practice, including: medical non-acceptance, woman's refusal and lack of space. All nurses familiar with ball use mentioned one or more types of cleaning before its use. The most frequent answers referred to water and soap, followed by 70% alcohol (26.7%); water and soap only (18.3%); disinfection with 70% alcohol (5%), sodium hypochlorite (3.3%) and chlorhexidine digluconate (1.7%). Twenty-seven answers mentioned protection with a cover or sheet (26.7%) and with PVC film (18.3%).

The nurses observed the following results in the parturients after using the ball: relaxation (53.1%) and pain relief (46.9%). Regarding the protocol for using the Swiss ball, almost all institutions visited did not have one (96.8%). Most institutions, i.e. 22 units (70.9%) had the ball for more than 2 years and 9 (29.1%) for more than 5 years.

DISCUSSION

Birth care practices and services receive influence from the roles played by the parturients, care professionals and the environment the event occurs in. Services where care is oriented at the physiology of birth and labor, where nurse-midwives and midwives can freely use their skills to enhance normal birth, permit the use of less interventionist comfort practices.

In this study, it was verified that labor care happens at the OC in 62.9% of services. Among the 35 hospital units under analysis, in little more than half of them (54.3%), including obstetric centers, nurse-midwives perform normal low-risk births. The BC corresponded to 37.1% of obstetric services in this research. Of these, 31.3% are located inside hospitals, only one adjacent to the hospital and another outside the hospital.

Concerning the use of the Swiss ball in labor care, it was observed that 100% of BC used the Swiss ball, against only 40.9% of OC. Although the location of birth was not a study variable, it is considered that, in general, BC have more space and privacy than obstetric centers, which facilitates the parturients' use of the ball. This reveals the influence of the environment on the resources care providers used as comfort practices, as appointed in a systematic review[1]. These results can be justified as the BC offer care resources focusing on women's more active and participatory labor and the use of non-pharmacological practices or conducts that privilege the physiology of labor and birth. The nurse's presence in parturient care also enhances the use of non-pharmacological practices or conducts, including: walking, movements and positioning, baths and massage, sitting and crouching position and pelvic movements enhance the progression of labor[19]. The use of these practices can put off or avoid the use of analgesics or anesthetics during labor.

Some authors have discussed the physiological foundations for the effect of maternal position on labor. The supine position negatively affects mother and fetus as it causes pressure on the vena cava and aorta, maternal hypotension and possibly fetal suffering. In this case, contractions become inefficient as, in the supine position, the fetal position is parallel to the maternal dorsal spine. When the parturient takes the vertical position, this permits gravity to make the uterus pend forwards, supported by the abdominal wall, facilitating the alignment of the fetus with the maternal axis, so that the pelvic passage angle is widened[7-8,15].

During labor, maternal immobility can contribute to increase the number of dystocia cases and risk of surgical births, as it hampers progression or fetal descent. A literature review on the effects of maternal movements during labor found that it can bring about decreased pain, facilitate maternal-fetal circulation, increase the intensity of uterine contractions, reduce the duration of labor, help with the descent and station of the fetal presenting part and bring down perineal trauma and episiotomy rates. In this context, the use of the Swiss ball permits women to take different positions, also before and after the use of epidural anesthesia[8].

In this study, with regard to the nurses' orientations

concerning the position and movements when using the ball, 36.5% of answers referred to the sitting position with support. None of the respondents mentioned orienting the sitting position without support. This is in line with recommendations for parturient women's adequate ball use, which should follow some safety precautions. Among these, the presence of a companion for support and safety or of a firm support in front of the parturient, like the bed for example, are fundamental[5].

As for the orientations that have been practiced for ball use, 31.7% of the answers the nurses gave mentioned the propulsion movement, up and down, when sitting on the ball and 30.5% the rotating hip movement. Only one answer referred to a position in which the parturient kneels, with her trunk on the ball and her arms around it. While in the sitting position, the pressure the perineum exerts on the ball makes the pelvic waist occupy a position in front of the spine, resulting in a better positioning for the fetus[17].

No consensus was found on the duration of its use to support labor. Most of the nurses (77.5%) answered that they indicated its use for 1h. A lower percentage (16.1%) answered orienting its use as long as the parturient feels comfortable on the ball, 3.2% orient intermittent sequences of 1h and the remaining 3.2% 30 minutes.

Regarding the most adequate cervical dilation for ball use, answers ranged between 4 and 7 cm. Most of the interviewees reported indicating the ball when the parturient's cervix reaches 4 cm of dilation. Lesser proportions answered indicating ball use at 5 cm (3.2%), 6 cm (32.3%) and 7 cm (9.7%) of cervical dilation. These data reflect a lack of consensus on the most appropriate cervical dilation to indicate ball use. This remits to the importance of further research in this sense, with a view to furthering knowledge on Swiss ball management during labor.

The only clinical essay found that investigated ball use was conducted in Spain, involving 58 parturient women who were randomly distributed in two groups (34 in the experimental and 24 in the control group). The result of this practice was assessed for at least 20 minutes, with regard to the duration of labor, the perineal condition and pain intensity, assessed at two moments. In the intervention group, no interference occurred, neither in the duration of dilation and expulsion periods nor in the perineal condition. Significant pain reduction occurred in the ball group, assessed with 4 cm of dilation ($p=0.039$) and in the post-partum ($p=0.003$)(20).

As for the obstetric condition or diagnosis to indicate the ball, the most frequent answer (34.8%) was help with fetal descent. In a scientific literature review, it is verified that maternal movements and position increase the diameters of the pelvic angles, facilitating the descent and station of the fetal presenting part. These findings were proven in a study that assessed, using magnetic resonance imaging and (anterior-posterior and transversal) pelvic tilt in 35 non-pregnant women in the crouching and four-point support position. The pelvic diameters increased by 8±9 mm in the crouching position and 6±7 mm in the four-point support position when compared with the supine position. It was concluded that these modifications could be more enhanced in pregnant women due to increased joint mobility brought about by the hormonal modifications of pregnancy[3].

According to the interviewed nurses, the obstetric diagnosis or condition in which they contraindicate ball use were mostly (37.8%) the existence of an obstetric illness, mentioning pregnancy induced hypertension (71.4%) and placental abruption (28.6%). In literature, no studies were found that contraindicated ball use in hypertensive pregnant women.

Concerning the association between ball use and other non-pharmacological practices, out of 33 answers obtained, the majority mentioned combining it with aspersion baths (54.6%) and massage (42.4%). Some authors confirm this association frequently happens[15]. Ball use permits pelvic waist movements in the vertical position, and aspersion bats can stimulate uterine contractions, enhance the feeling of wellbeing and mitigate lumbar-sacral pain[18].

Nurse-midwives commonly use non-pharmacological strategies for comfort and pain relief during labor, according to a cross-sectional study of 778 parturients at an extra-hospital BC in São Paulo City, according to World Health Organization recommendations, besides appointing high usage percentages of these methods, such as: aspersion bath (83%), walking (70%), massage (64%), Swiss ball (48.6%) and immersion bath (33%), included in Category A – Provenly useful practices that should be stimulated[21].

The North American study Listening to Mothers II* investigated what non-pharmacological pain relief methods were most effective according to 1,135 interviewed women who experienced labor, even when the outcome was surgical birth. Each woman gave one or more answers and the most mentioned were: 49%-breathing techniques, 42%-position changes and movements to relieve discomfort, 25%-hypnosis techniques, 20%-massages, 7%-Swiss ball use, 6%-immersion baths, 6%-applications of warm or cold objects, 4%-musical or aromatherapies and 4%-aspersion baths.

In this study, 32.9% of the nurses attributed beneficial

* http://www.childbirthconnection.org/pdfs/LTMII_report.pdf

effects on the descent and station of the fetal presenting part to ball use. Other answers referred to help with muscle relaxation and labor progression, perineal region exercises, pain relief, psychological benefits and parturient movement stimulation. The nurses' perception about the parturients' acceptance of ball use was considered "good" in 67.7% and "excellent" in 32.3% of answers. No "regular" and "bad" answers were given, which indicates a trend towards good acceptance of this practice.

A research involving 79 puerperal women who had actively participated in labor at a public maternity in São Paulo State classified the acceptance of normal birth stimulation practices as "very good", "good", "bad" and "very bad". A majority (52%) considered ball use "good" and 28% considered it was "very good". On the other hand, 12% and 8% of the women attributed he categories "bad" and "very bad", respectively[22].

Concerning the parturients' perception after using the ball, most answers (53.1%) were related with muscle relaxation. A bit less frequent (46.9%), pain relief was also mentioned. The movements accomplished when using the ball enhance comfort and can decrease pain by stimulating the mechanic receptors of the pelvic articulation[5].

When asked about difficulties to put in practice ball use during labor care, 25 (80.6%) nurses answered they did not face any problem. On the opposite, 6 (19.4%) of them answered they experienced some impediment when using the ball in delivery care. Three nurses mentioned the physician did not accept this practice, two mentioned patient refusal and one lack of physical space. Nevertheless, using the ball does not require much physical space.

Other reasons that can impede the use of maternal movements during labor are obesity and the woman's lack of understanding about the importance of movements to facilitate the progression of labor. The use of interventions like amniotomy, oxytocin infusion, fetal monitoring and epidural analgesia can also decrease mobility during labor[8].

A literature review on the Swiss ball emphasizes that the instrument is frequently used in gyms, physical therapy clinical, physical education classes and maternities, although its effectiveness in different health and sports medicine areas has not been fully clarified yet. Its management has not been standardized, and research on its efficacy and pain relief should be carried out[11].

CONCLUSION

This study aimed to characterize the use of the Swiss ball in labor care.

Its use and effectiveness in the obstetric area have not been clarified, which demands clinical research with better designed studies to produce evidence for labor care practice.

In this study, it was verified that the ball is used at different institutions, mainly Birth Centers, even without the existence of a protocol to clarify usage issues. Questions like the woman's safety when using the device, surface cleaning to avoid cross-contamination and even clarifications on the adequate moment(s) for its indication need to be standardized.

In this research, the facility of the participants' use of the ball was observed, almost fully based on their empirical observations. Thus, it can be concluded that there seem to be benefits attached to the use of the Swiss ball; nevertheless, clinical essays on this practice are needed to provide evidence and clarify the issues raised in this study. This investigation can help to produce knowledge on a non-conventional and non-invasive practice in labor care.

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