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Infants' swaddling practice in Jazan region: Medical students' knowledge and perspectives

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ABSTRACT

Background: Swaddling entails tightly covering an infant in a blanket, leaving just the head exposed. Swaddling is a common practice among Saudi mothers, but the risks and benefits between the practitioners received little attention. *Objectives:* This research seeks to assess the medical students' Jazan University knowledge of the swaddling practice regarding benefits and risks and assess their perspectives. *Methods:* A self-administered web-based questionnaire was distributed in the faculty of medicine among medical students at Jazan University. *Results:* The study involved 326 students about 91% saw the swaddling practice in real life, and 63% practiced it themselves. Our findings found that the medical students had a good knowledge level related to gender, marital status, knowing how to swaddle an infant, and practicing swaddling by them. *Conclusion:* While swaddling is a common practice, it has received little attention in evaluating the risks and benefits, particularly from a medical point of view. As a result, addressing medical students' knowledge of this practice could serve as a basis for future study and raise community awareness.

Keywords: Swaddling, Practice, knowledge, Perspectives, Medical students, Jazan region

1. INTRODUCTION

Swaddling involves wrapping the infant securely in a blanket with only the head keeping out, restricting the movement of the limbs, and keeping the body in the supine position. It was a nearly universal method of infant care in the last centuries to reduce excessive crying; it is, however, yet practiced in some parts of the Middle East, the United Kingdom, and the United States nowadays (Blom, 2005; Arabiat et al., 2019; Masataka, 1996; Yilmaz et al., 2012).

Many studies demonstrated that swaddling practice in infants has many benefits as it keeps infants sleeping more for an extended period in the supine position (Kelly et al., 2017; Franco et al., 2005; Chisholm, 1978). Other advantages of swaddling are infant relaxation and soothing of the pain, especially in infantile colic and neonatal abstinence syndrome (Campos, 1989). It is also noticed to improve neuromuscular development in preterm babies

and help in the motor organization of their bodies (Short et al., 1996). However, on the other hand, swaddling tightness has been linked to an increased risk of hip dysplasia and respiratory infections (Kutlu et al., 1992; Yurdakok et al., 1990). Moreover, swaddling could affect the baby's weight because it increases the sleeping period and reduces the regular breastfeeding time. Furthermore, the swaddling practice influences temperature regulation by raising the core body temperature (Short, 1998; Tsogt et al., 2016).

Medical students are involved in the community services in a voluntary role in the area and hold a substantial source of advice regarding many health issues. As a result, we decided to assess their knowledge of swaddling practice and their perspectives.

2. MATERIAL AND METHODS

Participants and study design

In 2021, a descriptive cross-sectional study was done in the Jazan region, a highly-populated area and one of the thirteen provinces of Saudi Arabia on the Red Sea's tropical coast in the southwest. Jazan University is a public research university based in Jazan. The faculty of Medicine is located on the main central campus that consists of male and female sections. This research was carried out among medical students at Jazan University from 2021-to to 2022. It includes students of the 2nd year up to the 6th year who consented to take part in the research.

Study tool

A data collection tool was a web-based questionnaire developed by the researchers depending on the previous literature and validated by a pilot test that included twenty participants. The questionnaire contains an informed consent section; the demographic data section includes sex, marital status, residence, and year of study. The third section includes swaddling practice questions, evaluating if the participant had seen the swaddling before, practiced it, or seen this practice between the family members. Then there are five questions to evaluate the knowledge, the proper way of the swaddling practice, and assessing the knowledge about risks and benefits by putting the statements in multiple-choice questions. The final section of the questionnaire contains five questions that explore the students' perspectives regarding this practice using a five-point Likert scale. Knowledge regarding the proper way of swaddling, which is tight wrapping over the upper limbs and loose over the lower limbs allowing for flexion and abduction movement of the legs, was measured against many other improper ways by five multiple-choice questions. The advantages of wrapping include: Helping with infantile colic, decreasing excessive crying, making infants sleep longer, and keeping the infant warm were put in eight multiple-choice questions to assess the participants' knowledge. Also, risks of the swaddling, which include: the harmful effects on hips, decreased the time of breastfeeding, causing hyperthermia, and increased the risks of chest infections, were put in nine multiple-choice questions aiming to evaluate the students' knowledge. A convenience sample was applied, and the study team distributed the questionnaire to the study participants through the anonymous online survey instrument (Google Form).

Data analysis

We use Statistical Package for Social Sciences software for data analysis, version 23.0 (IBM SPSS Inc., Chicago, IL). Initially, all information was gathered via a questionnaire and then coded into variables. Reliability Statistics for questionnaire validation using Cronbach's Alpha test (0.774= 77.4 %.) and normality of data was tested using Kolmogorov-Smirnov and Shapiro-Wilk tests. Descriptive and inferential statistics involving Pearson's Chi-square Test, Independent T-Test, and binary logistic regression presented the results. We considered a P-value lower than 0.05 to be statistically significant. The questionnaire used for assessing knowledge consists of 5-items that measure two domains. Each correct answer was given one mark, and the incorrect answer was calculated as a zero mark. Also, for multiple-choice questions, one mark was distributed according to the number of the answers; this gives a total score ranging between zero and five, then these results were transformed into percentages. To have good knowledge, the score of each participant should be more than the mean plus the standard deviation in the normally distributed data or more than the median if not normally distributed. For the students' perspectives 5 points, Likert scale was used starting from one(Less important) to five (very important), giving a mean score for five questions from 1 to 5. These response scores were transformed into percentages using this formula ((Mean-1)*25). The scores in two domains were not normally distributed, were expressed as median, then were categorized as less important (less than the median) and very important (median and above).

The ethical approval for this study was obtained from The Institute Review Board (IRB) of Jazan University.

3. RESULTS

Demographic data

Table (1) demonstrates the socio-demographic data of the 326 participants in this study. About 58 percent were females, with a third in their final year of medical school, 42 percent living in Jazan, and just 7.7% were married.

Table 1 demographic characteristics of the participants

Demographic characteristics	Number	Percent
Gender		
Male	136	41.7%
Female	190	58.3%
Academic level		
2nd year	89	27.3%
3rd year	45	13.8%
4th year	25	7.7%
5th year	61	18.7%
6th year	106	32.5%
Marital status		
Married	25	7.7%
Not-married	301	92.3%
Area of residence		
Rural area out of Jazan region	3	0.9%
Other town out of Jazan region	18	5.5%
Rural area in Jazan region	69	21.2%
Other town in Jazan region	97	29.8%
Jazan city	139	42.6%
n=326		

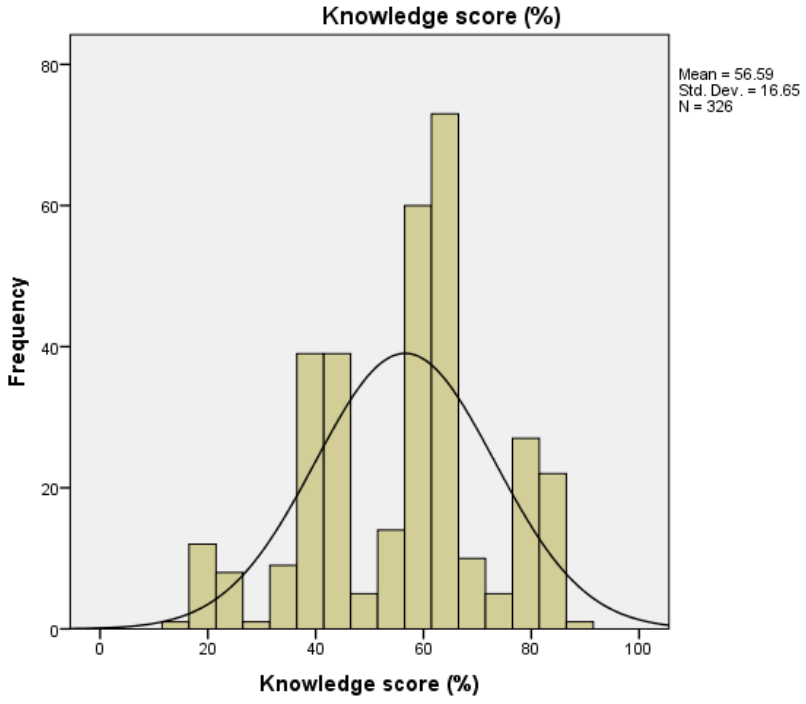

Figure 1 The knowledge score of the participants

Knowledge of swaddling practice

Approximately 90.8 percent of participants said they have seen a child swaddled in real life, 79 percent have seen other family members perform swaddling, and 63.5 percent knew how to swaddle an infant alone. However, only 24.8 percent of students knew how to swaddle correctly, according to the knowledge questions in the table (2). With a theoretical range of more than mean plus standard deviation to have good knowledge, the mean score of the participants' knowledge of swaddling practice was 57 (SD = 17; range 14–88), and accordingly, about 50.6 percent of the participants showed good knowledge of swaddling practice, as shown in figure (1). Furthermore, the Pearson Chi-Square test revealed a high relationship between knowledge and gender in favor of females (P 0.008), as well as knowledge and if the participant practiced swaddling by selves or any family member (P 0.0003), as indicated in the table (3). Furthermore, an independent t-test comparing the mean between the variables found a meaningful relationship between gender, marital status, knowing how to swaddle an infant, practicing swaddling on the one hand, and good knowledge in swaddling practice on the contrary (P <0.05).

Table 2 Participants' knowledge regarding proper swaddling, benefits, and risks of the practice

Knowledge variables	Number	Percent
Knowledge about the proper way of swaddling		
Loose both upper and lower limbs	20	6.1%
Loose over the upper limbs allowing movement , and tight over the lower limbs	22	6.7%
Tight both upper and lower limbs	77	23.6%
Tight over the upper limbs and loose over the lower limbs allowing for flexion , and abduction movement of the legs	81	24.8%
Don't know	126	38.7%
Knowledge about swaddling benefits for infants		
Yes	239	73.3%
No	87	26.7%
Knowledge about the benefits of swaddling		
increase the weight of infants	10	3.1%
Decrease sudden infant death syndrome	34	10.4%
Increase bonding between mother and infant	37	11.3%
Help in infantile colic's	55	16.9%
Decrease excessive crying	93	28.5%
Improve skeletal growth	116	35.6%
Make infant sleep longer time	187	57.4%
Keep the infant warm	205	62.9%
Knowledge about the benefits of swaddling		
Decrease excessive crying	2	0.6%
Help in infantile colic's	4	1.2%
increase the weight of infants	4	1.2%
Increase bonding between mother and infant	5	1.5%
Decrease sudden infant death syndrome	5	1.5%
Improve skeletal growth	19	5.8%
Make infant sleep longer time	31	9.5%
Keep the infant warm	43	13.2%
Knowledge about swaddling risks for infants		
Yes	250	76.7%
No	76	23.3%
Knowledge about risks of swaddling		
Decrease the weight of infants, delay infants	24	7.4%
Increase sudden infant death syndrome	25	7.7%
Decrease bonding between the mother and infant	26	8.0%

Increase risks of chest infections	26	8.0%
Decrease the time of breast feeding	40	12.3%
Delay infants walking	61	18.7%
Can cause hyperthermia	96	29.4%
It has harm effects in hips	126	38.7%
It has harm effects in shoulders	187	57.4%
n=326		

Table 3 Pearson Chi-Square Test for knowledge and other variables

Variables		Knowledge score		Pearson Chi-Square Test P- value
		Poor	Good	
Gender	Male	79	57	0.008
		58.10%	41.90%	
	Female	82	108	
		43.20%	56.80%	
Academic level	2nd year	35	54	0.066
		39.30%	60.70%	
	3rd year	28	17	
		62.20%	37.80%	
	4th year	16	9	
		64.00%	36.00%	
	5th year	31	30	
		50.80%	49.20%	
	6th year	51	55	
		48.10%	51.90%	
Marital status	Married	9	16	0.164
		36.00%	64.00%	
	Not-married	152	149	
		50.50%	49.50%	
Area of residence	Jazan city	67	72	0.649
		48.20%	51.80%	
	Other town in Jazan region	44	53	
		45.40%	54.60%	
	Other towns out of Jazan region	9	9	
		50.00%	50.00%	
	Rural area in Jazan region	39	30	
		56.50%	43.50%	
	Rural area out of Jazan region	2	1	
		66.70%	33.30%	
Ever seen the infant swaddling in the real life	Yes	143	153	0.222
		48.30%	51.70%	
	No	18	12	
		60.00%	40.00%	
Know how to swaddle an infant	Yes	88	119	0.001
		42.50%	57.50%	
	No	73	46	

		61.30%	38.70%	
You or other member practice swaddling in your family	Yes	114	144	0.0003
		44.20%	55.80%	
	No	47	21	
		69.10%	30.90%	

Table 4 shows the binary logistic regression for predicting medical students' knowledge of the benefits and risks of infant swaddling practice in Jazan Region. Participants' knowledge of swaddling practice was positively associated with their actual practice in their real lives or seeing other family members practice it (B = 0.832, p 0.013).

Table 4 Binary logistic regression for prediction knowledge of medical students about the benefits and risks of infant swaddling practice in Jazan Region

Variables in the Equation	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Gender (Male)	0.347	0.251	1.91	1	0.167	1.415	0.865	2.314
Academic level (Increase/seniors)	0.04	0.073	0.299	1	0.585	1.041	0.902	1.201
Marital status (Not-married)	0.395	0.46	0.737	1	0.391	1.484	0.603	3.653
Area of residence (Rural)	0.332	0.286	1.352	1	0.245	1.394	0.796	2.441
Ever seen the infant swaddling in the real life (Not)	-0.275	0.47	0.341	1	0.559	0.76	0.302	1.91
Know how to swaddle an infant (Not)	0.496	0.277	3.203	1	0.073	1.643	0.954	2.83
You or other member practice swaddling in your family (Not)	0.832	0.336	6.142	1	0.013	2.297	1.19	4.434
Attitude sore (%) (Decrease)	-0.007	0.006	1.253	1	0.263	0.993	0.981	1.005
Constant	-2.378	1.278	3.464	1	0.063	0.093		

Perspectives of the participants in swaddling infants

As per the descriptive summary of the participants' perspectives on swaddling practice, about half of the participants believe that swaddling practice knowledge is fundamental to medical students, and 70% believe that learning more about the advantages and risks of the swaddling is essential. About two-thirds of the respondents said it was an important research topic that should involve Saudi Arabian mothers' practices and expertise, and 54% thought it should be taught in medical school. Swaddling is a safe activity for infants; according to approximately 40% of the participants, as demonstrated in the table (5), the participants' perspectives on swaddling practice were predicted using a logistic regression model. They were substantially associated with their residential location. Participants from urban areas had more potential to experience lower perceptions of the infant and the risks and benefits of infant swaddling. The AOR was 1.763 (CI95 percent: 1.017-3.055) times statistically significant with P 0.05.

Table 5 the medical students' perspectives regarding swaddling practice in Jazan region

Perspective variables	Less important (1)	(2)	(3)	(4)	Very important (5)
Opinion related the significant of the awareness in swaddling practice for medical students	11	22	107	82	104
	3.4%	6.7%	32.8%	25.2%	31.9%
Opinion regarding teaching this topic in the medical school	15	18	116	61	116
	4.6%	5.5%	35.6%	18.7%	35.6%
Opinion regarding the research in swaddling practice involving the mothers practice and knowledge in	5	16	87	94	124
	1.5%	4.9%	26.7%	28.8%	38%

Saudi Arabia					
Think it is essential to have more knowledge about there are benefits and risks of swaddling	2	10	82	78	154
	0.6%	3.1%	25.2%	23.9%	47.2%
Overall perspective regarding swaddling:	13	35	152	57	69
	4%	10.7%	46.6%	17.5%	21.2%
n=326					

4. DISCUSSION

Even though swaddling is widespread in Saudi Arabia and the Arab world (Abdulrazzaq et al., 2008; Arabiat et al., 2019), according to existing published data, little is known regarding medical students' and health professionals' perspectives of the practice. Most people who practice swaddling learn it from non-medical culture or acquire it as a tradition from society. In one research of parents, it was discovered that most of those asked had received thorough experience on safe swaddling practices from non-medical resources (Joshua et al., 2018). Another study attempted to assess health practitioner awareness of hip-safe swaddling and discovered that awareness is relatively low (Pinto et al., 2020). Consequently, we tried to examine medical students' awareness of the swaddling practice to significantly educate and raise awareness in their communities.

This study suggests that the students in the faculty of Medicine at Jazan University generally have moderate knowledge of the swaddling practice. However, only 24.8% know the proper way of swaddling, which is tight wrapping over the upper limbs and loose over the lower limbs allowing for flexion and abduction movement of the legs. This finding is consistent with a former study in Saudi Arabia exploring the awareness of Saudi females about the relationship between swaddling practice and the developmental delay of the hip and concluded that only 37% of 2631 participants know the proper way to swaddle infants (Almahdi et al., 2017).

Of a critical note was that despite the evidence of the usefulness of swaddling in managing excessive crying and infantile colic (Van Sleuwen et al., 2007; Karp, 2007; Johnson et al., 2015), almost two-thirds of the participants did not know this fact. Moreover, only 17% were aware that swaddling helps in infantile colic despite its confirmed effects in soothing pain (Van Sleuwen et al., 2007; Nelson & Antonia, 2017). However, more than 50 percent of the participants in this study stated that swaddling makes infants sleep for extended periods, and this result was consistently evidenced by trials conducted in experimental and descriptive investigations and found that the arms being restrained may prevent the movements associated with a complete extensor startle response (Gerard et al., 2002). Also, about two-thirds found it an excellent way to keep infants warm, although one randomized control trial concluded no difference was found between swaddled and non-swaddled infants (Tsogt et al., 2016). However, hyperthermia could be a side consequence of swaddling, especially with the head also covered or infections present (Tronick et al., 1994).

Unexpectedly in this study, more than 30 percent of the participants believed that swaddling improves skeletal development, and this concept was against a randomized control trial conducted in the Mongolian context, concluding that prolonged swaddling did not affect psychomotor development (Manaseki-Holland et al., 2010). Notably, about 75% of the participants knew that there are risks of infants' swaddling. However, only 38% were aware of the influence of this practice on the hip joint, and this finding is consistent with the Saudi study that found that more than 77% of the participants were not aware of this risk (Almahdi et al., 2017). Furthermore, the effect of this practice is observed if the swaddling is prolonged or the lower limbs are positioned in a straight manner leading to dislocation (Wang et al., 2012). In this study, the gender and practicing infant swaddling by the participant or other family members showed significant association with good knowledge.

According to the findings of one randomized control trial, swaddling did not affect breastfeeding parameters such as the frequency and time of breastfeeds, the quantity of milk, or the total duration of breastfeeding time (Bystrova et al., 2007). However, one systematic review hypothesized that swaddling could negatively affect tactile stimulation and thus may affect infant growth (van Sleuwen et al., 2007). In this study, only 12 percent of the participant thought decreased feeding is one effect of swaddling practice as it separates the infant from the mother and increases the sleeping period. In the studies done to assess the relationship between swaddling and respiratory infections, they have found that tight swaddling can cause atelectasis, and swaddling also reduces sunshine exposure, increasing the risk of vitamin D deficiency, which can increase vulnerability to respiratory infections (Yurdakok et al.,1990; Wayse et al., 2004). However, our participants' knowledge regarding this fact was abysmal as only 8% knew that.

Our results showed that most participants agreed on the significance of awareness about the risks and benefits of swaddling that should be taught in medical school. Moreover, two-thirds of them think it is a good topic for further research and education of

mothers. There were no positive associations between socio-demographic variables and the direction of views, regardless of participants' residence, which showed a significant association.

This study has a limitation, which is the small sample size that may affect the precision of the study. It would have been more robust if it had included many participants from other health colleges and many more Saudi Arabian regions.

5. CONCLUSION

Swaddling is a method that has many diverse perspectives. Many cultures have employed it in several different ways. When not used properly, it poses a significant risk to infants. Otherwise, it is a good technique for infant care if appropriately utilized. The current study revealed that although the medical students in the Jazan region had average knowledge of swaddling practice, their knowledge regarding risks and benefits still needs more. Good knowledge was associated with sex, marital status, knowing how to swaddle, or seeing other family members practicing swaddling. The medical students needed evidence-based knowledge relating to infant swaddling to support their role in the community service, especially in areas where this practice is prevalent, like Jazan region.

Ethical approval

The Ethical Committee approved this study at Jazan University, College of Medicine, Saudi Arabia (Ethical approval code: REC-43/05/087) on 26 December 2021

Authors' contributions

Ebtihal Eltyeb contributes to Idea formulation, manuscript writing, and design.
Najwa Dahas contribute to data collection, statistical analysis, and final approval.
Njoud Osaysi contributes to data collection, statistical analysis, and final approval.
Maram Alshaikhi contributes to data collection, statistical analysis, and final approval.
Abdullah Ghazwani contributes to data collection, statistical analysis, and final approval.
Fatimah Ageeli contributes to data collection, statistical analysis, and final approval.

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Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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