



Parental Attitude and beliefs towards child vaccination: Identifying Vaccine Hesitant groups in a family health center, Erbil city Iraq ..... page 17

## From the Editor

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In this issue a number of papers from the region addressed various issues. Helvacı, M.R et al tried to understand whether or not there is a chronic inflammatory background of autoimmune thyroiditis (AT) on vascular endothelium in sickle cell diseases (SCDs). All patients with the SCDs and age and sex-matched controls were studied. The study included 428 patients with the SCDs (220 males) and 414 controls (213 males). Mean ages of the SCDs patients were similar in males and females (30.6 versus 30.1 years, respectively,  $p > 0.05$ ). Both smoking (24.0% versus 6.2%) and alcohol (5.0% versus 0.4%) were significantly higher in males with the SCDs ( $p < 0.001$  for both). Although AT was diagnosed in 7.2% of the control cases (26 females and 4 males), this ratio was only 0.7% (just in 3 males) in the SCDs patients ( $p < 0.001$ ). On the other hand, transfused red blood cell units in their lives (47.6 versus 28.4,  $p = 0.000$ ), chronic obstructive pulmonary disease (25.4% versus 7.2%,  $p < 0.001$ ), ileus (7.2% versus 1.4%,  $p < 0.001$ ), cirrhosis (7.2% versus 1.9%,  $p < 0.001$ ), leg ulcers (20.0% versus 7.2%,  $p < 0.001$ ), digital clubbing (14.0% versus 6.2%,  $p < 0.001$ ), coronary artery disease (18.1% versus 12.9%,  $p < 0.05$ ), chronic renal disease (10.4% versus 6.2%,  $p < 0.05$ ), and stroke (12.2% versus 7.6%,  $p < 0.05$ ) were all higher in males with the SCDs. The authors concluded that SCDs are severe inflammatory processes on vascular endothelium at the capillary level, terminating with an accelerated atherosclerosis induced end-organ failures and a shortened survival in both genders. Beside that, SCDs may cause moderate to severe immunosuppression by several mechanisms that may be the cause of significantly reduced prevalence of AT in SCDs.

Raof A.M conducted a descriptive study to determine parental hesitancy toward vaccination inside Erbil city; Iraq, and to find associations between the parents' position towards vaccination and the outcome of immunization. The data were collected through a self-administered questionnaire. It included two sections: The first section related to the demographic characteristics of clients. The Parent Attitudes Childhood Vaccines (PACV) questionnaire, used as a second part to detect parents those who have concerns about vaccination. Parental position in respect to immunization of their child revealed that 65.3% were unquestioning acceptor, 20.6% were cautious acceptor, 9.9% were hesitant, 3.5% were late or selective vaccinator and only 0.7% was refusal. Immunization behaviors of parents among different groups showed that, 20.9% postponed their child vaccination for causes other than sickness or sensitivity, while 73% provided immunization in time. More than two third (65.9%) were completely sure that, it's a good idea to follow the schedule of immunization for their child and only 26.6% were not sure. The current study showed parents had some positive aspects related to vaccination and defect in some domains were recognized. Identifying these parents is important in order to implement the necessary measures to maintain and improve the vaccines intake.

Desouky ES et al, carried a cross-sectional study to know the magnitude of knowledge and attitude of Saudi medical and non-medical students towards FM specialty. Medical students showed a significant higher percent of students who saw that FM specialty has an essential social function, has a pleasant working environment, has a high social status, is an attractive option for a medical students, is an interesting specialty from a research perspective, and is an important specialty in: disease prevention/Health promotion, family-focused health care, bio-psychosocial focus of health care, collaboration with other sectors, team work, bioethics, and urgent care. Only 6% of medical students chose FM as a future career, and the most common factor influencing the specialty preferences was the good working condition and the quality of life. Female students and older grades showed a significant higher percent of choosing FM as a future career. For all participants, the study reflects

the bad reputation about FM specialty regarding its status within the medical profession, scientific prestige and salary. The authors concluded that Medical students had better knowledge and perception of family medicine compared to non-medical students, but they had low interest in choosing it as a future career.

Naseer Muhammad, Musarrat Shaheen, Muhammad Khalil Ur Rahman, Faiza Rahman, and Fazal Haleem reviewed the relationship between teachers' behavior and corporal punishment: Lessons, implications, and recommendations in KPK district, Pakistan. They found that male teachers show more positive behavior than female teachers towards corporal punishment which implies that female teachers should be appointed at the primary school level in preference to men who engage in corporal punishment, in order to provide a healthy and free from corporal punishment learning environment for students.

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# Saudi university students' awareness and attitude towards family medicine specialty

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## Abstract

**Background:** Worldwide, there is shortage of family medicine (FM) specialists and disinterest of medical students in choosing FM as a career. Saudi Arabia is facing the same problem.

**Objectives:** The aim of this study was to know the magnitude of knowledge and attitude of Saudi medical and non-medical students towards FM specialty.

**Methods:** A cross-sectional study was done on 708 students of Taif University using a self-administered questionnaire about socio-demographic factors, knowledge and attitude towards FM specialty.

**Results:** Medical students showed a significant higher percentage of students who saw that FM specialty has an essential social function, has a pleasant working environment, has a high social status, is an attractive option for a medical students, is an interesting specialty from a research perspective, and is an important specialty in: disease prevention/Health promotion, family-focused health care, bio-psychosocial focus of health care, collaboration with other sectors, team work, bioethics, and urgent care. Only 6% of medical

students chose FM as a future career, and the most common factor influencing the specialty preferences was the good working condition and the quality of life. Female students and older grades showed a significant higher percentage of students choosing FM as a future career. For all participants, the study reflects the bad reputation about FM specialty regarding its status within the medical profession, scientific prestige and salary.

**Conclusion:** Medical students had better knowledge and perception of family medicine compared to non-medical students, but they had low interest in choosing it as a future career.

**Key words:** students, Saudi, awareness, attitude, family, medicine

### Abbreviations

FM	Family medicine
FP	Family Physician
KSA	Kingdom of Saudi Arabia
SPSS	Statistical Package of Social Science
$\chi^2$	Chi-square test

## Introduction

Family medicine (FM) is a cornerstone for developing a community based health care system (1), and family physicians (FPs) are the most appropriate physicians to be located in primary health care (2). They are qualified to provide continuing and comprehensive medical care, health maintenance and preventive services to each member of the family (3).

Worldwide, many people suffer from lack of access to proper preventive and curative health services due to shortage of FM specialists (4,5), or their mal-distribution (6), a matter that has forced many countries to adopt national strategies to overcome this problem.

There is a decrease in the number of medical students interested in choosing FM as a career (4,7,8,9,10), a matter that makes the low number of FM specialists a worldwide problem (2,4, 5, 7,8,9,10).

Studies have found that medical students know the importance of FM specialty, but did not consider it attractive according to the scientific and technical interest, workplace conditions, and research prospective (11,12,13). Their knowledge about FM specialty was found to increase by studying it as a mandatory course in medical colleges, but that doesn't increase their interest in choosing it as a profession (6, 14).

A systematic review of ten studies done on medical students in western countries found that over the last decade, medical students showed a decreased interest in FM as a career choice. This result was revealed although students found FM an interesting specialty, but they considered it a career of low prestige (4, 5, 8, 15).

According to studies done in Arab countries, a nationwide web-based survey carried out on 600 students of seven Egyptian medical colleges showed that, although 90.7% of them believed in the importance of FM in the Egyptian healthcare system, only 4.7% showed an interest in its choice as a future career (16).

In the Kingdom of Saudi Arabia (KSA), FM practice became a recognized specialty because of increasing cases of morbidity and mortality due to preventable diseases (17). That is why there is an urgent need to train as many family medicine practitioners as possible to deal with these cases (17). Studies from KSA have shown that more attention is required at all levels of FM in order to produce an adequate number of family physicians to improve the academic aspects and the services provided by FM in the country (18,19,20).

According to a study titled " Family medicine practice in Saudi Arabia: the current situation and proposed strategic directions plan 2020", there is a shortage of qualified family physicians in all Saudi health care sectors (21). Despite the scarcity of Saudi FM practitioners and the governmental need for this specialty, only one study was done on medical students of King Saud University to assess students'

knowledge about the family medicine specialty and their attitude towards choosing FM as a career. The study found that students knew the importance of FM specialty only after the FM course was taken in the college. The study notified the high probability that the general Saudi population will have little knowledge and appreciation of the importance of the family medicine practice (22).

Knowledge and attitudes of Saudi university students towards FM is presently not well known as only one known study was done to address this issue. That is why this study was carried out to know the magnitude of knowledge and attitude of both medical and non-medical students of Taif University towards FM specialty.

## Subjects and methods

**Study Design and time frame:** The present study was a cross-sectional study done on students of Taif University in the time frame from January to May 2018.

**Sampling methodology:** Multistage sampling methodology was carried out, and the university community of Taif University was the sampling frame. The university includes two (female and male) sections. The medical college was chosen by its male and female sections and simple random sampling methodology was carried out to choose the non- medical college, where its male and female sections were included.

The total number of students from the medical and non-medical colleges (male and female sections) registered in the academic year 2017-2018 was obtained from the office of the student's affairs. After exclusion of the non-respondents, the total number of participants was 753 students, with a response rate of 69.46%. Incomplete questionnaires (45) were excluded leaving 708 questionnaires for final analysis.

**Inclusion/exclusion criteria:** All students who agreed to share in the study from the two colleges were included. Non-Saudi students and those who refused sharing were excluded.

**Ethical Considerations:** The study was reviewed and approved by the Research Ethics Committee of Taif University, and from the deanships of the colleges included in the study. Verbal consent was obtained from students before participating in the study.

**Study instrument:** A self-report format of a pre-designed questionnaire where the first few question were to collect data about age, sex, marital status, and educational grade, was used. A filter question about previous knowledge about FM specialty was added, where students who replied "yes" (502 students) were qualified to reply to the subsequent questions on knowledge and attitude towards FM specialty. For each item a 5-point Likert scale from strongly disagree to strongly agree was used and scored from 1- 5 respectively, where a score greater than 3 was considered a positive response (16).

For medical students, an additional section was added to address their specialty preference, factors influencing their preferences, and reason for not choosing FM specialty for students who replied they were not choosing FM as a future career. The items of the questionnaire were taken from questionnaires used in previous research (9, 16, 23, 24). Afterwards, pilot testing of the questionnaire was carried out on 40 university students to check the clarity, comprehension and the interpretation of each item.

**Statistical analysis:** Data was coded, tabulated and analyzed using (SPSS) version 20 (Armonk, NY: IBM Corp.). Qualitative data was expressed as numbers and percentages, and Chi- squared test ( $\chi^2$ ) was applied to test the relationship between variables, and quantitative data was expressed as mean and standard deviation (Mean  $\pm$  SD). A p-value of  $<0.05$  was considered as statistically significant.

## Results

In the present study, among the 708 participants, 53.4% were females, 61% were from the medical college, and their mean age was  $(20.48 \pm 1.75)$  years. The percentage of the participants from each grade ordered from the 1st to the 6th is as follows: 15.1%, 18.5%, 19.9%, 19.5%, 13.6% and 13.4% respectively. About 70% of all participants had heard about FM specialty before, and only 48% thought that they had a good knowledge about FM specialty. Of the participants, only 7.5% had a FP among relatives, 64.4% visited a PHC Unit as consumers before, and 79.4% of them were satisfied with the service given (Table 1).

**Table 1: Comparison between medical and non-medical students according to their response to statements related to FM specialty**

Parameter	Medical students (No.: 432)		Non-Medical students (No.: 276)		Chi (Square $\chi^2$ ) test	p-value
<b>Heard about FM specialty:</b>						
- Yes	376	87	126	45.7	139.81	<0.001
- No	56	13	150	54.3		
<b>Having a good knowledge about FM specialty:</b>						
- Yes	274	63.4	66	23.9	105.33	<0.001
- No	158	36.6	210	76.1		
<b>Having a FP among relatives:</b>						
- Yes	27	6.3	26	9.4	1.72	0.189
- No	405	93.7	250	90.6		
<b>Visited a PHC unit as consumers:</b>						
- Yes	285	66	171	62	1.18	0.276
- No	147	34	105	38		
<b>Satisfaction with given service:</b>						
- Yes	224	78.6	138	80.7	0.28	0.591
- No	61	21.4	33	19.3		

Table 1 shows that a highly significant difference was found between medical and non-medical students (in the favor of medical students) according to previous hearing about FM, and having adequate knowledge about it ( $p = <0.001$ ).

**Table 2: Comparison between medical and non-medical students according to their response to statements about the FM role in Saudi Arabia**

Do you believe that FM in Saudi Arabia:	Medical students (No.: 378)		Non-medical students (No.: 126)		Chi (square $\chi^2$ ) test	p-value
	No.	%	No.	%		
	<b>Has an essential social function:</b>	318	84.1	18		
- Positive response	60	15.9	108	85.7		
- Negative response						
<b>Is a pleasant working environment:</b>	264	69.8	30	23.8	82.38	<0.001
- Positive response	114	30.2	96	76.2		
- Negative response						
<b>Has a high social status:</b>					18.14	<0.001
- Positive response	118	31.2	15	11.9		
- Negative response	260	68.8	111	88.1		
<b>Is an attractive option for a medical student:</b>					35.55	<0.001
- Positive response	143	37.8	12	9.5		
- Negative response	235	62.2	114	90.5		
<b>Has a high status within the medical profession:</b>					3.64	0.056
- Positive response	66	17.5	13	10.3		
- Negative response	312	82.5	113	89.7		
<b>Provides a high salary in comparison with other specialties:</b>					0.28	0.592
- Positive response	36	9.5	10	7.9		
- Negative response	342	90.5	116	92.1		
<b>Is an interesting specialty from a research perspective:</b>					7.02	0.008
- Positive response	90	23.8	16	12.7		
- Negative response	288	76.2	110	87.3		
<b>Has a level of scientific prestige equivalent to other specialties:</b>					0.049	0.824
- Positive response	54	14.3	17	13.5		
- Negative response	324	85.7	109	86.5		

Table 2 shows a highly significant difference between medical and non-medical students (in the favor of medical students) according to their opinion that FM specialty: (1) Has an essential social function, (2) Has a pleasant working environment, (3) Has a high social status, (4) Is an attractive option for a medical students, and (5) Is an interesting specialty from a research perspective ( $p < 0.001$ ). A non-significant difference was found between medical and non-medical students according to their opinion that FM specialty: (1) Has a high status within the medical profession, (2) Provides a high salary in comparison with other specialties, and (3) Has a level of scientific prestige equivalent to other specialties.

**Table 3: Comparison between medical and non-medical students according to their response to the importance of FM's contributions to other areas of preparation**

Contribution	Medical students (No.: 378)		Non-medical students (No.: 126)		Chi Square ( $\chi^2$ ) test	p value
	No.	%	No.	%		
<b>Communication/Doctor-patient relationship</b>	318	84.1	101	80.2	1.06	0.303
- Positive response	60	15.9	25	19.8		
- Negative response						
<b>Clinical attention for the most common problems</b>	300	79.4	90	71.4	3.4	0.056
- Positive response	78	20.6	36	28.6		
- Negative response						
<b>Disease prevention/Health promotion</b>					17.28	<0.001
- Positive response	258	68.3	60	47.6		
- Negative response	120	31.7	66	52.4		
<b>Health care across the lifespan</b>					0.415	0.52
- Positive response	132	34.9	48	38.1		
- Negative response	246	65.1	78	61.9		
<b>Family-focused health care</b>					22.04	<0.001
- Positive response	180	47.6	30	23.8		
- Negative response	198	52.4	96	76.2		
<b>Bio-psychosocial focus of health care</b>					44.36	<0.001
- Positive response	134	35.4	6	4.8		
- Negative response	244	64.6	120	95.2		
<b>Community-focused health care</b>					1.32	0.249
- Positive response	72	19	30	23.8		
- Negative response	306	81	96	76.2		
<b>Collaboration with other sectors (education, social services or other)</b>					19.24	<0.001
- Positive response	132	34.9	18	14.3		
- Negative response	246	65.1	108	85.7		
<b>Bioethics</b>					4.48	0.034
- Positive response	91	42.1	19	15.1		
- Negative response	287	75.9	107	84.9		
<b>Clinical epidemiology</b>					0.93	0.334
- Positive response	113	29.9	32	25.4		
- Negative response	265	70.1	94	74.6		
<b>Team work</b>					21.65	<0.001
- Positive response	192	50.8	34	27		
- Negative response	186	49.2	92	73		
<b>Urgent care</b>					7.62	0.006
- Positive response	80	21.2	42	33.3		
- Negative response	298	79.8	84	66.7		
<b>Research</b>					0.016	0.901
- Positive response	83	22	27	21.4		
- Negative response	295	78	99	78.6		

In Table 3 a significant difference was found between medical and non-medical students (in the favor of medical students) according to their response to the importance of FM in:

- (1) Disease prevention/Health promotion,
- (2) Family-focused health care,
- (3) Bio-psychosocial focus of health care,
- (4) Collaboration with other sectors (education, social services or other),
- (5) Team work
- (6) Bioethics, and (

7) Urgent care ( $p < 0.005$ ). A non-significant difference was found between medical and non-medical students according to their response to the importance of FM in:

- (1) Research,
- (2) Clinical epidemiology,
- (3) Community-focused health care,
- (4) Health care across the lifespan,
- (5) Clinical attention for the most common problems, and
- (6) Communication/Doctor-patient relationship ( $p > 0.005$ ).

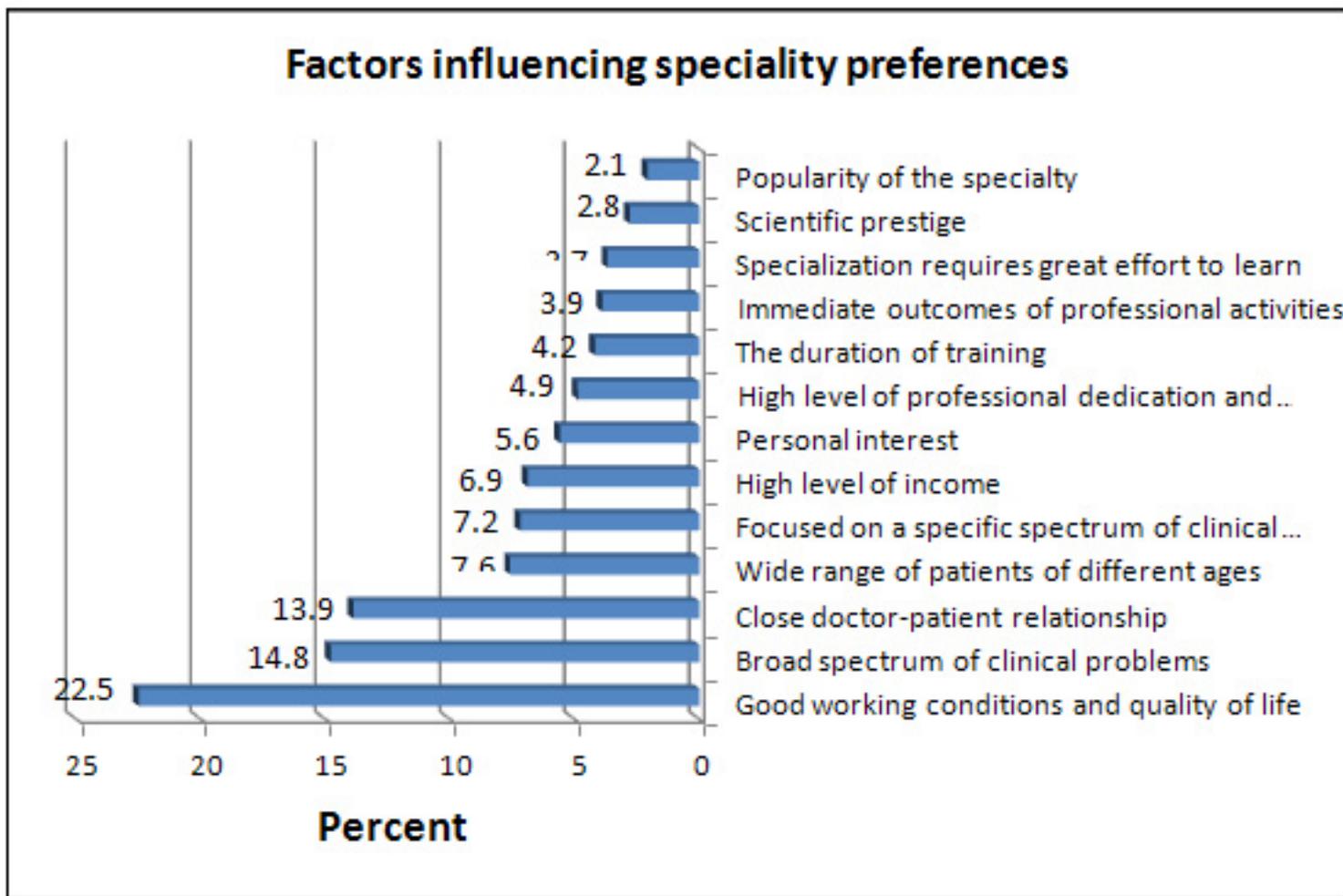
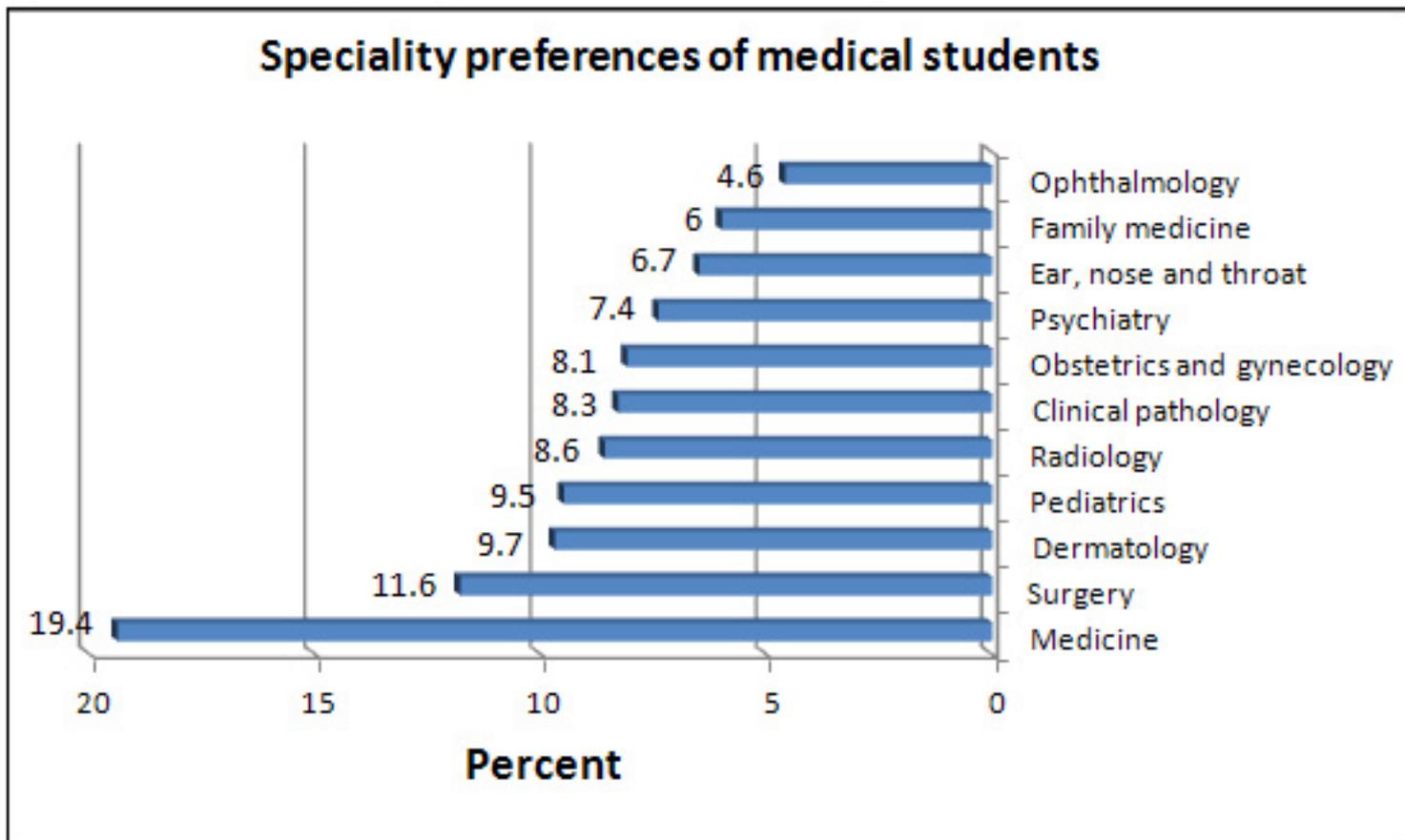
Figure 1 (next page) shows that according to the students' specialty preferences, FM ranked the tenth among eleven specialty options given to students (only 6% of students chose it a future career). The most common factor that influenced the specialty preferences of medical students was the good working condition and the quality of life, and the least factor was the popularity of the specialty (Figure 1).

The reasons for not choosing FM as a future career for medical students was the student's disinterest in the specialty for (44.2%) of students, lack of information about FM for (29.5%) of them, being a difficult field (15.5%), and (10.5%) of students had multiple reasons of the above.

Table 4 (page 27) shows that a significant gender difference was found according to choosing FM as a future career, as 8% of female students chose it compared to 3% of male students ( $p = 0.034$ ). A significant difference was found between students' grades as regards choosing FM as a future career, where the 6th grade students had the highest percentage of students who chose FM, followed by the 5th grade, the 4th, the 3rd and the 2nd grade students (11.6%, 8.3%, 7.4%, 2.7%, and 1.7% respectively) ( $p = 0.022$ ). None of the students in the 1st grade chose FM as a future career.

A significant difference was found between students according to their choice of FM as a future career and having a FP among relatives, where 18.5% of those who have a FP among relatives chose FM, compared to 5.2% of those who don't have a FP relative and chose FM ( $p = 0.005$ ). A non-significant difference was found between students who chose and who didn't choose FM according to: having a good knowledge about FM specialty, previous visit of a PHC Unit or their satisfaction as consumers with the service given ( $p > 0.005$ ).

Figure 1: Medical students' specialty preferences and factors influencing their choice



**Table 4: Association between some studied variables and the choice of FM as a future career by medical students**

Parameter	Chose FM		Didn't Choose FM		Chi Square ( $\chi^2$ ) test	p-value
	No.	%	No.	%		
<b>Gender</b>						
- Male	5	3	163	97	4.49	0.034
- Female	21	8	243	92		
<b>Grad</b>					13.12	0.022
- 1 <sup>st</sup> grade	0	0.0	53	100		
- 2 <sup>nd</sup> grade	1	1.7	58	98.3		
- 3 <sup>rd</sup> grade	2	2.7	73	97.3		
- 4 <sup>th</sup> grade	4	7.4	50	92.6		
- 5 <sup>th</sup> grade	8	8.3	88	91.7		
- 6 <sup>th</sup> grade	11	11.6	84	88.4		
<b>Having a good knowledge about FM specialty?</b>					3.58	0.058
- Yes	21	7.7	253	92.3		
- No	5	3.2	153	96.8		
<b>Having a FP among relatives</b>					7.95	0.005
- Yes	5	18.5	22	81.5		
- No	21	5.2	384	94.8		
<b>Visited a PHC Unit as Consumers</b>					1.47	0.224
- Yes	20	7	265	93		
- No	6	4.1	141	95.9		
<b>Satisfaction with given service</b>					0.52	0.469
- Yes	17	7.6	207	92.4		
- No	3	4.9	58	95.1		

## Discussion

Determining the public knowledge and attitudes towards FM specialty and identifying deficiencies in knowledge can help those responsible for health education to raise awareness of the community about the importance of FM and correct any related misconceptions (25).

In the present study medical college had a significant higher percentage of students who had heard previously about FM or had adequate knowledge about it when compared to non-medical students (Table 1). This result goes along with that revealed from another Saudi study which stated that the general Saudi population does not know the importance of FM specialty to the country (22). The study reported that this lack of information was present even among medical students, where their knowledge and attitude towards FM did not improve until they had completed the FM training course in the college.

Compared to the non-medical college, medical college also had a significant higher percentage of students who had a positive response towards FM as having an essential social function, a pleasant working environment, a high social status, and their response that FM is an attractive option for medical students, and is an interesting specialty from a research perspective (Table 2). This result was observed in previous studies done with medical students where the vast majority of students surveyed reported the essential social function of FM (11,12,15).

The same positive response regarding the work environment was displayed also in previous studies where students saw the work environment of the family practice is friendly due to lack of competition compared to a hospital work environment (26), and the ability of working in a multidisciplinary team (27).

This work shows that, despite 84.1% of medical students who thought that FM has an essential social function, only 37.8% thought that it is an attractive option for a medical

student, 17.5% thought that FM has a high status within the medical profession, 14.3% thought that it has a level of scientific prestige equivalent to other specialties, and only 9.5% thought that FM specialty provides a high salary in comparison with other specialties (Table 2). This disappointing trend was observed in a study done in Spain which found that despite 89.8% of medical students who reported the important social role of FM; only 20% believed that FM has a high status within the medical profession (9).

This result is in agreement with previous studies which reported that FM is at the 'bottom of the medical hierarchy' and it is considered as an inferior choice according to medical students' point of view (4,11).

In the present study, only 37.8% of medical students thought that FM is an attractive option for a medical student. This result was seen in other studies which found that despite medical students who agreed on the essential social role of FM they did not consider it to be an attractive option for a medical student. The cause of their opinion was the lower scientific prestige, lower salary and less research opportunities of FM compared to other specialties (11,12,15).

This study showed that, only 9.5% of medical students thought that FM specialty provides a high salary in comparison with other specialties, a result that was revealed from another study done on medical students in Toronto University where about 89% of them saw that FPs are paid too little (28). In another study medical students see that the FP is unable to gain additional income from the private sector (11).

In the present work only 14.3 % of medical students surveyed thought that FM has a level of scientific prestige equivalent to other specialties. This negative opinion was also revealed from a systematic review which found that despite medical students finding FM appealing, it was considered as a specialty of low interest and prestige (15).

The non-significant difference found between medical and non-medical students according to the previous four items (FM as an attractive option for a medical student, has a high status within the medical profession, has a level of scientific prestige equivalent to other specialties, provides a high salary in comparison with other specialties), reflects the ignorance of the general Saudi population of the basic role of FM and the aspects it presents as an important medical specialty for the Saudi society. It also reflects the bad reputation and misconceptions about FM specialty among the general population.

This study showed that compared to students of the non-medical college, medical students reported a significant higher positive response to the importance of FM in disease prevention/health promotion, family-focused health care, bio-psychosocial focus of health care, and collaboration with other sectors, team work, bioethics, and urgent care (Table 3). This result goes along with that revealed from

a study done in Spain where students found that the most important contributions of FM was in doctor-patient relationship and the clinical attention for the most common problems (9), a matter that can solve the Saudi health sector problem of the shortage of qualified FPs (21).

This study showed a non-significant difference between medical and non-medical students according to their response to the importance of FM in clinical attention for the most common problems, and communication/doctor-patient relationship, where more than 70% of all students had a positive response to the importance of FM in these two fields (Table 3). The same result was revealed from previous studies where medical students pointed out the FPs/patients relationship, as they saw the general physicians, were more patient centered (29,30).

Similarly, less than 40% of all students (without a significant difference between medical and non-medical students) had a positive response to the importance of FM in research, clinical epidemiology, community-focused health care and health care across the lifespan, with no significant difference between medical and non-medical students (Table 3). This reflects absence of basic information about the role of FM and nature of the work of the FP among the studied sample. The same opinion was observed in a previous study where medical students complained of the lack of research in the FM training (11,12).

According to medical students' specialty preferences, internal medicine specialty was the most chosen specialty in the present study, a result that was seen in a Turkish study (31). The most common specialties chosen by students in the present study were internal medicine, surgery, dermatology and pediatrics. The same result was observed in another two Saudi studies (32,33). This result was also reported by medical students in other international studies where surgery, general medicine and pediatrics were the most chosen specialties by surveyed medical students (34).

According to FM specialty, the present work showed that only 6% of students chose it as a future career, where it ranked the tenth among eleven specialty options given (Figure 1). This result goes along with that observed in a recent Saudi study done on 220 medical students of Taibah University, where only 6.8% of students chose FM (33).

In a previous Saudi study done on medical students of King Saud University, medical students become more willing to practice FM only after completing their clinical training course and getting a wide knowledge on FM, when about 58% of them chose FM as a future career (22). This finding reflects the negative attitude of medical students towards FM specialty, which boosts results observed in other studies where FM is devalued as a professional activity and a future career by medical students. (4,7,8,9,10).

The proportion of students who chose FM as a future career in the present study is lower than that observed in other international studies (4,5,7,8,9,10). The low

percentage of medical students who chose FM as a future career is observed in the present study despite 84.1% of them reporting that FM has an essential social function and 69.8% stating that it has a pleasant working environment. These contradictory responses were reported in an Egyptian study, where 90.7% of students believed in the vital role of FM, but only 4.7% of them reported to choose it as a future career (16). And it goes along with other international studies where medical students know the importance of FM specialty, but do not consider it an attractive career choice. (11,12,13).

The percentage of students who chose FM as a future career in the present study is however higher than that observed in a study done in nine universities in five sub-Saharan African countries, where only 4.5% of medical students chose FM as a future career (35). It is also higher than results revealed from a study done in Spain where only 1.4% of medical students chose FM (36).

The good working conditions and the quality of life were the most common factors that influence the specialty preferences among surveyed medical students in the present study; a result that was also reported by medical students in a previous Saudi study where lifestyle and personal interest were the most common factors influencing specialty preferences (32).

The high level of income was ranked 6th among thirteen options of factors influencing career preferences chosen by medical students in the present study, a result that was observed in another Spanish study where the high salary ranked 8th among the given options (9).

The least important factor that influenced career choice in the present study was the popularity of the specialty, a result that is in keeping with an Egyptian study, where the nature of the specialty and its importance were the most observed factors influencing the career choice (16).

A previous systematic review demonstrated the importance of assessing factors influencing choosing FM as a future career among medical students to prevent the future shortage of FPs (37). The present study showed that 44.2% of students who didn't choose FM as a future career reported their disinterest as a reason for not choosing FM.

Studies have demonstrated and explained the disinterest of medical students towards choosing FM as a future career in the light of being a boring practice with an administrative role that compromised its medical aspects according to students' opinion (11). Other studies showed that medical students see FM as a superficial specialty that is not intellectually challenging as it deals with common diseases while severe problems are referred to specialists (4,11). Some students think that advances in medical knowledge can be found only in organ or disease-based specialties (11). Medical students in another study thought that the duty of the FP is just to triage patients, and practicing FM has a lack of evidence base as it teaches them communication and counseling skills but not knowledge (30).

The negative attitudes and comments from residents, peers, or other specialists on FM were found to have a negative effect on the students' interest in FM too (4,11). Other studies showed that families may force the medical student to choose another specialty (4,11), a matter that reflects the ignorance of the public of the importance of the specialty of FM. Others explained this in the light of the negative perception of medical students of FM clinical rotation as being a study overload as it focuses on theoretical aspects of FM rather than the practical ones (16). FM is a medical field that has a high expectation level, as the FP should have adequate knowledge about every facet of health care, and this may make medical students less motivated to choose FM as a future career (38).

In Saudi Arabia, FM specialty is facing a lot of challenges; these challenges include the inefficient and incomplete health records in hospitals and medical training centers, the lack of skilled trainers in the FM field for effective teaching of medical students, [8], in addition to the shortage of FPs which increase the workload and the burnout of the available physicians, and in turn decreases the time they have to teach medical residents (19,39). This situation was illustrated in a previous Saudi study which showed that all Saudi medical colleges have a FM department with a total staff of only 170 teachers (21).

Previous studies proposed changing the curriculum design of medical schools to start teaching the basic elements of FM early in the third or fourth year (4,40). Others proposed improving the practical and theoretical content of the curriculum of FM to improve medical students' knowledge and attitude towards it, and to increase their willingness to choose it as a future career (9). These proposals have proved effective in a previous Saudi study where medical students become more willing to choose FM as a future career after completing their clinical training course (22). The significant gender difference in choosing FM as a future career in the favor of females was found in other studies (7,9,16,41). This gender difference was explained in another study by the female belief of their presence in a double income family which enables them to consider choosing FM without consideration of the income (4,42). In addition, female medical students think that FM enables working part-time allowing having a family. A different result was observed in a Japanese study where a non-significant difference was found between male and female medical students according to their choice of FM as a future career (43).

The undergraduate medical programme of Taif University includes 6 years divided into 12 semesters. Medical students are exposed to FM in the FM module taught in the 5th year which has a five weeks length, where clinical FM is covered during these weeks. In the present work, a significant difference was found between students' grades according to choosing FM as a future career, where the highest percentage of students who chose FM were in the 6th grade followed by students in the 5th grade, the 4th, the 3rd and the 2nd grade respectively. This result was observed in a previous study done in South Africa where

students in the first three years of medical colleges showed the least interest in FM (44). It is also in line with studies that reported the increased interest in FM over years of medical training, and the improvement of their attitude towards FM as they progress in medical school (7,9), a finding that was somewhat explained by the more contact with general physicians during students training (45).

The observed gradual increase of students' interest in FM as they progress in the study years could be hypothesized by the low interest of students in the early years due to lack of exposure to FM (8).

The significant higher percentage of students who choose FM in the 5th and 6th year could be explained by their completion of the FM module in the 5th year, besides their exposure to FPs during their rotations. This was proved by the result of the previous Saudi study done in King Saud University, where medical students' desire to select FM specialty increased after completion of their clinical training course (22). This result is in agreement with studies which showed that medical students become more interested in choosing FM after experiencing FM clinical training and gaining knowledge about the specialty during the clinical rotation [29]. This enables them to understand different aspects of the specialty which can change their attitude towards it (29,46).

In the present study, FM was not chosen as a future career by any student in the 1st grade, a matter that was found in a previous study and explained by the students' poor knowledge regarding FM (41).

Studies have shown that having a FP among relatives may be a motive for a medical student to choose FM as a future career. The present study observed this relation, where 18.5% of medical students who have a FP among relatives chose FM, compared to 5.2% of those who don't have a FP relative chose FM.

In the present study, having a good knowledge about FM specialty, previous visit of a PHC Unit or their satisfaction as consumers with the service given didn't affect medical students choice of FM as a future career. This result is in contrast with the previously mentioned Egyptian study where students' intention to choose FM as a future career was found to be associated with a previous consumer experience with FM (16). This could be explained by the good status of PHC units in Saudi Arabia as an oil producing country with better health care services available in PHC settings. This was proved in a previous study done to assess the Patients' Satisfaction with Primary Health Care Centers' Services in the capital which showed that 82% of clients were satisfied with the services, where cleanliness of the PHCs and technical abilities of the staff were the most common reasons behind satisfaction (47). This high level of satisfaction was reported in other national studies (47,48).

## Conclusion

This study demonstrated that medical students had better knowledge and perception of family medicine compared to non-medical students, but they had low interest in choosing it as a future career. Interest in FM as a specialty increases among female students and those in older grades. All studied students had a bad opinion about FM regarding its status within the medical profession, scientific prestige and salary. The study calls for awareness campaigns to increase the awareness of the Saudi population on FM specialty and the role of the family physician. Strategies should be planned and implemented by medical schools to increase the knowledge of FM specialty among medical students, to define its parameters, and to change the medical curriculum to enable the exposure of medical students to the content of FM in their early years in the medical school.

## Limitations

Limitations of this study are: (1) Using a self-reported questionnaire which was prone to recall bias. (2) Study design was a cross-sectional one which showed the relation between variables without concluding the cause-effect relationship. (3) Findings of the study can't be generalized on Saudi university students as it was limited to only one Saudi university (4). The intention of medical students to choose FM as a career is not known whether it will be implemented in the future or not.

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# Parental attitude and beliefs towards child vaccination: identifying vaccine hesitant groups in a family health center, Erbil city, Iraq

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## Abstract

**Objectives:** The current study was conducted to determine parental hesitancy toward vaccination inside Erbil city, Iraq, and to find associations between the parents' position towards vaccination and the outcome of immunization.

**Methods:** A descriptive study was done during the period from 1st of January 2014 till 1st of July 2015. The data were collected through a self-administered questionnaire. It included two sections: The first section related to the demographic characteristics of clients. The Parent Attitudes Childhood Vaccines (PACV) questionnaire, was used as the second part to detect parents who have concerns about vaccination.

**Results:** Parental position in respect to immunization of their child revealed that 65.3% were unquestioning acceptors, 20.6% were cautious acceptors, 9.9% were hesitant, 3.5% were late or selective vaccinator and only 0.7% were refusal. Immunization behaviors of parents among different groups showed that, 20.9% postponed their child's vaccination for causes other than sickness or sensitivity, while 73% were provided with immunization on time. More than two thirds (65.9%) were completely sure that, it is a good idea to follow the schedule of immunization for their child and only 26.6% were not sure.

**Conclusion:** The current study showed parents had some positive aspects related to vaccination and defects in some domains were recognized. Identifying these parents is important in order to implement the necessary measures to maintain and improve the vaccines uptake.

**Key words:** parental concerns, trust, vaccination coverage, vaccine safety, immunization; parental attitude; parental belief; vaccine.

## Introduction

Immunization leads to a remarkable reduction in cases of vaccine-preventable infectious diseases between children. The rise in immunization conflict has encouraged several researchers to investigate childhood vaccination and parental judgment. Parents' decisions regarding immunization can impact immunization rates, including access to vaccinations, the communication of risks and benefits, the maintenance of accurate vaccination records, and strategies for vaccination reminders. Parents were divided into groups according to their attitudes and beliefs about childhood vaccination. Parents accepting vaccination without questioning were called unquestioning acceptors and the hesitant group were called the questioning group (1). Vaccine hesitancy was defined as postponement of vaccination regardless of accessibility of services (1).

Attention to hesitant parents was essential for consideration and for stabilizing rising immunization opposition. They constitute a much bigger group than the other group who absolutely refuse immunization (2) and were possibly the most liable to change their behavior because they were influenced by evidence from child health care workers about immunization (3). The best way is to approach hesitant parents to report their worries and to convert their concern about immunization into practical points for discussion (4-8).

Other studies have recommended, that uncertainties in respect to vaccination were habitually ignored and not addressed.(7) This deficit leads to incomplete immunization of children, who will subsequently be susceptible of acquitting infectious diseases such as mumps or measles (9,10,11).

The directions of the national immunization campaigns in Iraq recommended, that a child less than one year of life, must be immunized through regular immunization with: BCG vaccine; three doses of DPT (Diphtheria, pertussis, tetanus); polio vaccine (four doses), Hepatitis-B (three doses), and measles for nine months old children. On reaching the age of fifteen months MMR is given. WHO guidelines, considered a child as fully immunized if they took DPT vaccine (three doses), polio vaccine (three doses), BCG (one dose), and measles vaccine, at twelve months(12).

In respect to the coverage of immunization in this region; approximately 91 per cent of children aged 12 to 23 months received BCG during the first twelve months of age, and about 85 percent received the first dose of DPT. However, the percentage declines for the subsequent doses DPT: 75 percent for the second dose and 64 per cent for the third dose (12).

However, the success of an immunization program depends on high rates of acceptance and coverage. Refusal of vaccine results in outbreaks as evidence shows (4).

As the concept of "vaccine hesitancy" is quite new, the accessibility of obtainable research is inadequate, especially in this region. The aim of the current study was to address parental hesitancy toward vaccination inside Erbil city, Iraq, and to find associations between parents' position towards vaccination and the outcome of immunization. There is no evidence of such a study being conducted in the Kurdistan region or even in Iraq. The investigator found it necessary to conduct the current study in order to address this issue.

## Methods

### Study design:

A descriptive study was conducted during the period from the 1st of January 2014 till the 1st of July 2015.

Researchers classified families into two groups according to the definitions published by Leask et al (8). The first group included the Unquestioning acceptor (vaccinate with no specific questions) and Cautious acceptor (vaccinate despite minor concerns). The second was the hesitant spectrum which included; the hesitant parents (vaccinate but have significant concerns; focused on vaccine risk; trust in healthcare provider and have high levels of vaccine knowledge).

The second were called Late or selective vaccinator (had concerns about vaccination results in this group choosing to delay or select only some recommended vaccines; they have highest level of vaccine knowledge). The third were called Refusal of vaccines (they have strong and specific religious, cultural or philosophical beliefs with lower levels of vaccine knowledge).

The data were collected through a self-administered questionnaire. The questionnaire was distributed to them by researcher for one time only and it was anonymous. The first section of the questionnaire enquired about the demographic characteristics of the studied sample. This part included education of parents, ethnic group, marital status, number of children, and the parent answering the questions - whether the father or the mother. The second part was the Parent Attitudes Childhood Vaccines (PACV)(10) questionnaire, an instrument used to detect parents who have concerns about vaccines. The PACV has four domains. The first domain was about immunization behavior, which consists of ten items. The second part was opinions about vaccine well-being and effectiveness consisting of four items and the third domain was attitudes to vaccination and exclusions which included two items. The fourth domain is trust and also included two items. The total items numbered eighteen items to identify vaccine-hesitant parents. Scored from 0 to 100, the higher scores on the PACV corresponded with under-immunization and hesitancy. Parents were considered to be hesitant toward vaccines if they scored  $\geq 25$ . The tool had three different response formats on a Likert scale (e.g., yes/no/don't know); a five point Likert scale (e.g., strongly agree, agree, not sure, disagree, strongly disagree), and an 11 point scale (e.g. responses ranging from "0: not sure at all" to "10: completely sure"). The 11 point response scale

was used to maximize the information obtained regarding trust and overall hesitancy (10). The outcome of immunization among the hesitant parents was found.

### Sampling: method and sample size

There are three family centers in Erbil city, two of which are under renovation; one health center was the setting of this study. The family health centers are public health clinics that provide two immunization days per aweek, before 12 pm. About twenty children were vaccinated in the clinic. The vaccines are provided by public clinics only and it is free for all. According to the Multiple indicator cluster survey, (12) a total of 120,000 children were to be immunized inside the city. The present study used this number as the total population from which the sample size was drawn. An automated software program (Raosoft sample size calculator for study: <http://www.raosoft.com/samplesize.html>) was used to calculate the sample size required for this study. With an accepted margin of error of 5% and a 95% confidence interval, the sample size required was 383 with the addition of 30% to the estimated sample size in order to overcome erroneous results and increase the reliability of the results and the conclusion. However, a sample of 600 parents were approached but only 564 parents responded and the response rate was 94%.

### Data analysis

The data were analyzed using SPSS for windows (Statistical Package for Social Science) version 21.0 and  $\leq 0.05$  was used as level of significance. For measuring associations between nominal variables, the Chi-square test was used, and t-test used for finding difference in the mean scores between non-hesitant and hesitant groups. This scoring was used to find the degree of parental hesitancy.

### Ethical consideration:

The proposal was submitted to the Directorate of Health of Erbil city. Approval from DOH was taken to assist the data collection by a researcher from the family clinic. The parents and health workers were well informed about the aim of the study. The parents were approached; informed verbal consent was taken, before filling in the questionnaire and confidentiality was assured.

## Results

**Table 1: Distribution of the studied sample by socio-demographic characteristics of the studied population**

Father's education	No (%)
<13 yr	49 (8.7)
13-18 yr	70 (12.4)
>18 yr	445(78.9)
Mother's education	
<13 yr	80 (14.2)
13-18 yr	161(28.5)
>18 yr	323 (41.1)
Marital status	
Married	556 (98.6 )
Widowed	8 (1.4)
Number of preschool children	
1	236 (41.8)
2-3	304 (53.9)
>3	24 (4.3)
Questionnaire answered by	
Father	200 (35.5)
Mother	364 (64.5)
Total	564

Table 1 shows 564 parents who participated in this study. Relation to the child, in 64.5% of the sample was the mother who answered the questionnaire in the clinic, while in only 35.5% the fathers did. Number of pre-school children was between two to three children in 53% of the sample.

**Table 2: Distribution of the studied sample by immunization behaviors**

Immunization behaviors items	Yes		No		Don't Know		Total	
	(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)
<b>Delaying the shot for reasons other than illness or allergy</b>	118	20.9	416	73.8	30	5.3	564	100
<b>Deciding not to give a shot for reasons other than illness or allergy</b>	26	4.6	532	94.3	6	1.1	564	100
	Completely sure		Not sure		Neutral			
<b>Following the recommended shot schedule is a good idea</b>	372	65.9	150	26.6	42	7.4	564	100
	Strongly Agree / Agree		Not sure		Disagree / Strongly Disagree			
<b>Its parent's role to question shots</b>	111	19.7	113	20.03	340	60.3	564	100
	Yes		No		Don't know			
<b>Letting the second infant to get all the recommended shots</b>	342	60.6	98	17.4	124	21.9	564	100
	Not at all hesitant / Not too hesitant		Not sure		Somewhat hesitant / Very hesitant			
<b>The parent considering himself hesitant about shots</b>	330	58.5	116	20.6	118	20.9	564	100

Table 2 shows immunization behaviors of parents among different groups. About 20.9% delayed the vaccination for reasons other than infection or sensitivity, while 73.8% had the immunization on time. More than two thirds (65.9%) were completely sure that to follow the suggested program is protective for their child and only 26.6% were not sure. Asking about the role of parents to question shots shows that two thirds (60.3%) disagreed and strongly disagreed with the idea, while 19.7% strongly agreed and agreed while, 20% were not sure. Those who considered themselves not hesitant about childhood shots were 58.5%; 20% were hesitant and another 20.6% not sure.

The difference between the unquestioning group and the questioning group (caution, hesitant, refusal, late or delay) was statistically significant in respect to immunization behaviour items when the mean was compared.

Table 3: Distribution of the studied sample by Beliefs about vaccine safety and efficacy

Beliefs about vaccine safety and efficacy	Strongly Agree / Agree		Not sure		Disagree / Strongly Disagree		Total	
	(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)
Children get more shots than are good for them	192	34.0	110	19.5	262	46.5	564	100
Believing that many of the illnesses shots prevent are severe	118	20.9	130	23.1	316	56.1	564	100
Getting immunity by sickness is better than a shot	94	16.6	78	13.8	392	69.5	564	100
It is better for children to get fewer vaccines at the same time	192	34.0	136	24.1	236	41.8	564	100
		Not at all concerned / Not too concerned		Not sure		Somewhat concerned / Very concerned		
Being concerned that a child might have a serious side effect from a shot	288	51.1	40	7.1	236	41.8	564	100
Being concerned about safety of childhood shots	376	66.6	46	8.2	142	25.2	564	100
Being concerned that a shot might not prevent the disease	400	70.9	58	10.3	106	18.8	564	100
		Yes		No		Don't know		
Knowing someone who has had a bad reaction to a shot	110	19.5	428	75.9	26	4.6	564	100

Table 3 shows that 34% of the studied sample agree and strongly agree that children get more shots, while 46.51% disagree and strongly disagree. For the second item concerning shots preventing severe diseases, 20.9% agree and strongly agree, and 56.1% disagree and strongly disagree. 16.6% agree on developing immunity by getting sick, while about 70% disagree. One third agreed on giving children fewer vaccinations at the one time, 51% were not disturbed about side effects of vaccines and 41.8% had concern about this issue; 70.9% were not concerned that vaccination will not give protection.

**Table 4: Distribution of the studied sample by general attitude and trust**

General attitude and trust	Yes		No		Don't Know		Total	
	(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)
Giving shots in order to enter daycare or school	46	8.2	486	86.2	32	5.7	564	100
Trusting the information received about shots.	468	83	52	9.2	44	7.8	564	100
Openly discussing concerns about shots with child's doctor	436	77.4	58	10.3	70	12.4	564	100
How much trust in child's doctor	370	65.6	152	27	42	0.2	564	100

Table 4 shows that 8.2% of parents revealed that the only reason to get a shot is for entering the day care center, while 86.2% answered no. The majority (83%) believed the instructions they obtained regarding immunization, and 7.81% don't trust the information they receive about shots. Table 4 also shows that 77.4% discuss their worries about vaccine with health workers and 10.3% did not discuss their concern with the child's doctor. Parents in questioning acceptor group scored higher for attitude and trust mean score compared to parents in the second group (the unquestioning group).

**Table 5: Distribution of the studied sample by hesitant parental position and vaccination outcome\***

Parental position According to Hesitancy	Immunization status of children			
	Fully immunized	Selectively immunized	Unimmunized	Total
	No. (%)	No. (%)	No. (%)	No
<b>Hesitant group spectrum (<math>\geq 25</math>)</b>				
Hesitant	46 (57.5)	8 (14)	2 (3.5)	56
Late / Selective	16 (20)	4 (5)	0	20
Refusing	0	2(2.5)	2 (2.5)	4
<b>Non-Hesitant group(score &lt;25)</b>	481(99.4)	3(0.62)	0	484
<b>Total</b>	543(96.3)	17(3.01)	4(0.7)	564

Chi-square =54.87 P=0.0023 between Hesitant and non-Hesitant group.\*

Table 5 shows that 80 out of 564 (14.2%) parents were among the three sub-groups of hesitancy spectrum. 56 out of 80 (70%) were among the hesitant. The second late or selective vaccinator was 20 out of 80 (25%) and the third sub-group who refuse vaccination were only 5%. Among the hesitant 57% of their children were fully immunized, 14% were a selective immunizer and only 3.5% were unimmunized. The refusing parents show that 2.5% were unimmunized and the fully immunized among the non-hesitant group of parents was 99.41% with a statistically significant difference (p=0.0023).

**Table 6: Distribution of the mean PACV screening score with presence of hesitancy or not\***

PACV domains	Hesitant parents	Non-Hesitant parents	95%CI	P value
	Mean± SD	Mean± SD		
Immunization behaviors	45±4.1	22±3.2	39.1-48.2	0.001
Beliefs about vaccine safety and efficacy	42±1.2	20±4.2	31.4-47.2	0.025
General attitude and trust	36± 1.1	19±1.6	29.7–39.2	0.032
<b>Overall</b>	<b>42±3.1</b>	<b>20 ±3.1</b>	<b>39.7–47.7</b>	<b>0.0012</b>

\*t- test was used to compare between two independent samples.

Table 6: The immunization behaviors domain mean score for the hesitant and non-hesitant was 45±4.1 and 22±3.2 respectively with statistically significant difference (p=0.001). The beliefs about vaccine safety and efficacy domain mean score was 42±1.2 and 20±4.2 respectively for the hesitant and non-hesitant groups with statistically significant difference (p=0.025). The overall mean score was 42±3.1 and 20 ±3.1 with statistically significant difference between the two groups.

## Discussion

The demography of the participating parents showed that mothers were more responsible for children's vaccination (64.5%) which is expected since all participating parents had under 2 years old children who are usually more under the mother's care (12). The mean age of parents' was 34.9 years in the current study, similar to an Italian study (33.4 years mean age) (13) with more than two-thirds of mothers (69.6%) being of high-school education or higher.

Our finding showed that 65.3% of the parents in the center were willing to vaccinate their children without hesitancy or questioning, with another 20.6% who were slightly concerned but still maintain a positive view on vaccination (totaling 85.9%), a comparatively higher percentage than Dutch parents (43%)(14). While hesitant continuum parents (Hesitant, Late vaccinator, Refusal) were 14.18% of our sample out of these 80 parents were in the hesitancy spectrum. Hesitant, Late vaccinator, and Refusal were 70%, 25%, and 5% respectively, comparing these results to Australia's study 34%, 55%, and 11% (15). The current study finds that hesitancy was higher but late vaccinator and refusal of vaccination is lower than previous studies. The refusal in the Dutch parents' was 11% which is also higher than our results(14). In the study of USA (16) 71.7% of the parents had no vaccine doubt and 28.2% were in the vaccine doubt group.

Delaying the vaccination on the other hand accounted for 20.9% of parents which is relatively higher than USA's 13% (17). Immunization was delayed by 36.6% of Jordanian parents'(18). This can be related to either vaccine hesitancy, or parents' lack of commitment toward vaccinating their children. Lack of education about vaccination during visits seems to be the reason behind poor practice of vaccination and the possibility of vaccination delay.

Parents' behavior toward vaccine consisted of higher compliance than refusal. With the majority (94%) answered no when asked if they have ever chosen not to vaccinate one of their children for other causes than infection, a minority of 4.6% answered yes, and 1.1% were not sure. Comparing these results to a Canadian study (88%, 7%, 5%) (19), it was obvious that the Canadian parents' have relatively similar views to our sample parents. The non-medical exemption in USA reaches to 26% which is higher than our result (20). Two thirds and more (65.9%) considered, following the recommended vaccination schedule is for the benefit of the child. The study of Taif Saudi Arabia (21) reported higher figures (73.9%). In the study of Michigan 90% (22) of parents overwhelming contributed to the idea that vaccines are a perfect approach to protect their children from disease. Asking about shots preventing many of the illnesses, the answer was yes for 20.9% of the parents in the current study.

A study was conducted in Tennessee and California (23); the mothers were given vaccine information at screening and 92% showed a positive attitude toward vaccine preventing diseases. A study in India (24) showed 70% of mothers thought that vaccination prevented diseases. The low figure in our study is explained by lack of information about vaccination. In an overcrowded health center, the health worker doesn't have the time to give health messages about immunization to these hesitant parents.

Perception of sample parents that children currently get more shots than is good for them was 34%, slightly higher than American parents (29.7%) (25). About 16% of parents thought, becoming sick is better than immunization, comparatively similar to American parents (16.6%) (25). Another study in Atlanta reported a higher figure (24%). The parents agreed that the body protects itself without vaccines (26) or it could be due to brief visits, making

it difficult for the parents to request information about vaccine. Another explanation was that the immunization does not challenge other tasks inside the primary health care center. A study in Jordan also reported a higher figure (26.5%) than the current study (18).

In a study in Tennessee and California (23) 62% agreed that a child's immune system will be overloaded with multiple vaccines on one occasion. In a study in Malaysia (27) 93% agreed that a child is excessively immunized in the first two years of their life.

In our study 66.6% have no concern about vaccine safety, a lower figure (46%) was reported in the study of Tennessee and California (23) that has no concern about vaccine safety. Regarding routine immunization protecting children from communicable diseases and its fatal complications the answer was yes for 70% of parents; a study in Saudi Arabia (21) reported higher figures than our study (91%). In the study in Jordan (18) 90% agreed that the available vaccines are carefully checked for safety.

While perceived efficacy showed that 71% were not at all concerned or not too worried that vaccine might not protect the child from occurrence of diseases, was similar to USA's 72.7% (25) and lower than Canada's 86% (19), while a study that was done in Mosul city, Iraq reported that 80.4% of parents agreed about vaccine preventing diseases (28).

More than half (51.1%) of parents were not at all concerned or not too concerned that vaccine might be associated with serious side effects. Concerns from serious side effects of Immunization were reported by 41.8% of parents. In Saudi Arabia's study 57% (21) agreed on this statement. Assessing knowledge of parents' in Mosul, Iraq (28) revealed that 43% of them consider vaccination as harmful and causing side effects. Another study in Mosul (29) revealed that 23% of parents were concerned about side effect of vaccine. In the study among Canadian parents' 68% (19) were concerned. The study in the USA (25) showed that 61% were concerned about vaccine safety and efficacy. An internet based study in Germany showed that 12.2% were concerned about overloading the immune system, would be side effects of immunization (30).

In the current study 8.2% of parents do agree on vaccination before school entry. Trust in the information received about shots was shown by 83% of parents. In the study in Jordan (18) 63% of parents agreed on the importance of preschool immunization. The low figure in our study could be explained by lack of awareness about the immunization schedule. There are many causes behind parent's non-medical exemptions to vaccination before entry to school (18). However this issue has not been tackled here.

According to a Multiple indicator cluster survey, the proportion of children who were completely immunized at the age of twelve months is 45%, and 57% at any time before the survey was conducted (12). This figure is near to the figure reported in the current study (57.5%) among

the vaccine hesitant mothers. In the study of Mosul, Iraq, 54.2% completed vaccination (31). A study in Diayla, Iraq (32) showed that 70% were fully vaccinated, 24% partially vaccinated and 6% not vaccinated. In an Indian study (33), 86% of the children were found to be fully vaccinated for their age and 14% were partially vaccinated. Parents with lower PACV scores (the non-hesitant group), 99% of their children were fully immunized, with significant difference with parents who had higher scores (the hesitant group) ( $p=0.0023$ ). The under immunization was explained by vaccine hesitancy. The Malaysian study reported similar findings (34).

A comprehensive approach is needed to provide accurate information to parents who are concerned about the safety and necessity of vaccines. Local population-based strategies need to be developed inside Erbil city, to direct provider-to-parents communication strategies and groups to assess the effectiveness of social media interfaces to address questions from vaccine-hesitant parents. The investigators believe that the current study provides another critical arm of this comprehensive approach in that it addresses several aspects identified by parents as important or challenging in this effort. The study can be implemented in other settings; the tool can address concerns in the first visit requiring vaccines, and the tool can be used in the clinic under the supervision of a health care providers.

The current study has several limitations. First, the study only targeted children younger than two in one center inside Erbil city, who may not represent all Kurdistan region children. The convenient sampling and cohort design further limited the generalization of the findings to the entire Erbil governorate.

Another limitation of our work is that parents' concerns about vaccine safety and parents' decisions to vaccinate their children were not measured continuously over the period during which children were administered vaccines. Therefore, our data cannot show whether parents' attitudes and beliefs will be modified over time to positively influence the vaccination status of their children.

## Conclusion

The current study showed parents had some positive aspects related to vaccination and defects in other domains were recognized. Identifying these parents was important in order to implement the necessary measures to maintain and improve the vaccination coverage in this region. The investigator recommends an educational intervention study; to be conducted among vaccine hesitant parents to find if any changes occur in the measured parental attitudes toward vaccines.

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# What a low prevalence of autoimmune thyroiditis in sickle cell diseases

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## Abstract

**Background:** We tried to understand whether or not there is a chronic inflammatory background of autoimmune thyroiditis (AT) on vascular endothelium in sickle cell diseases (SCDs).

**Methods:** All patients with the SCDs and age and sex-matched controls were studied.

**Results:** The study included 428 patients with the SCDs (220 males) and 414 controls (213 males). Mean ages of the SCDs patients were similar in males and females (30.6 versus 30.1 years, respectively,  $p>0.05$ ). Both smoking (24.0% versus 6.2%) and alcohol (5.0% versus 0.4%) were significantly higher in males with the SCDs ( $p<0.001$  for both). Although AT was diagnosed in 7.2% of the control cases (26 females and 4 males), this ratio was only 0.7% (just in 3 males) in the SCDs patients ( $p<0.001$ ). On the other hand, transfused red blood cell units in their lives (47.6 versus 28.4,  $p=0.000$ ), chronic obstructive pulmonary disease (25.4% versus 7.2%,  $p<0.001$ ), ileus (7.2% versus 1.4%,  $p<0.001$ ), cirrhosis (7.2% versus 1.9%,  $p<0.001$ ), leg ulcers (20.0% versus 7.2%,  $p<0.001$ ), digital clubbing (14.0% versus 6.2%,  $p<0.001$ ), coronary artery disease (18.1% versus 12.9%,  $p<0.05$ ), chronic renal disease (10.4% versus 6.2%,  $p<0.05$ ), and stroke (12.2% versus 7.6%,  $p<0.05$ ) were all higher in males with the SCDs.

**Conclusion:** SCDs are severe inflammatory processes on vascular endothelium at the capillary level, terminating with an accelerated atherosclerosis induced end-organ failures and a shortened survival in both genders. Beside that, SCDs may cause moderate to severe immunosuppression by several mechanisms that may be the cause of significantly reduced prevalence of AT in SCDs.

**Key words:** Autoimmune thyroiditis, sickle cell diseases, chronic endothelial damage, atherosclerosis

## Introduction

Chronic endothelial damage may be the major cause of aging and related morbidity and mortalities by causing disseminated tissue hypoxia all over the body. Much higher blood pressure (BP) of the afferent vasculature may be the major underlying cause, and probably whole afferent vasculature, including capillaries, are involved in the process. Some of the well-known accelerators of the inflammatory process are physical inactivity induced excess weight, smoking, and alcohol for the development of irreversible consequences including obesity, hypertension (HT), diabetes mellitus (DM), cirrhosis, peripheral artery disease (PAD), chronic obstructive pulmonary disease (COPD), chronic renal disease (CRD), coronary artery disease (CAD), mesenteric ischemia, osteoporosis, and stroke, all of which terminate with premature aging and death. They were researched under the title of metabolic syndrome in the literature (1, 2). Similarly, sickle cell diseases (SCDs) are chronic inflammatory processes on vascular endothelium at the capillary level, and terminate with accelerated atherosclerosis induced end-organ failures in early years of life. Hemoglobin S (HbS) causes loss of elastic and biconcave disc shaped structures of red blood cells (RBCs). Probably loss of elasticity instead of shape is the main problem because sickling is very rare in peripheral blood samples of cases with associated thalassemia minors, and human survival is not so affected in hereditary spherocytosis or elliptocytosis. Loss of elasticity is present during whole life, but exaggerated with increased metabolic rate of the body. The hard RBCs induced chronic endothelial inflammation, edema, and fibrosis at the capillary level terminate with tissue hypoxia all over the body (3, 4). Capillary systems may mainly be involved in the process due to their distribution function for the hard bodies. We tried to understand whether or not there is a chronic inflammatory background of autoimmune thyroiditis (AT) on vascular endothelium at the capillary level in the SCDs.

## Material and Methods

The study was performed in the Medical Faculty of the Mustafa Kemal University between March 2007 and April 2016. All patients with the SCDs and age and sex-matched controls with them were included into the study. The SCDs were diagnosed with the hemoglobin electrophoresis performed via high performance liquid chromatography (HPLC). Medical histories of the SCDs patients including smoking habit, regular alcohol consumption, painful crises per year, transfused RBC units in their lives, surgical operations, leg ulcers, and stroke were learnt. Due to their cumulative atherosclerotic effects together with the SCDs, patients with a history of one pack-year were accepted as smokers, and one drink-year were accepted as drinkers. A complete physical examination was performed by the Same Internist. Cases with acute painful crisis or another inflammatory event were treated at first, and the laboratory tests and clinical measurements were performed on the silent phase. A check up procedure including serum iron,

iron binding capacity, ferritin, creatinine, liver function tests, thyroid function tests, markers of hepatitis viruses A, B, C and human immunodeficiency virus, a posterior-anterior chest x-ray film, an electrocardiogram, a Doppler echocardiogram - both to evaluate cardiac walls and valves and to measure systolic BP of pulmonary artery, an abdominal ultrasonography, a venous Doppler ultrasonography of the lower limbs, a computed tomography of brain, and a magnetic resonance imaging (MRI) of hips was performed. Other bones for avascular necrosis were scanned according to the patients' complaints. Associated thalassemia minors were detected with serum iron, iron binding capacity, ferritin, and hemoglobin electrophoresis performed via HPLC. Thyroid autoantibodies including thyroid peroxidase autoantibodies (TPOAb) and antithyroglobulin antibodies (TgAb) were studied just in cases with an abnormal thyrotrophin (TSH) concentration in serum, and AT was diagnosed by the positivity or positivities of the thyroidal autoantibodies together with an abnormal TSH concentration in serum. ELISA (The Trinity Biotech Captia) was used to detect the serum positivities of the TPOAb and TgAb. The criterion for diagnosis of COPD is post-bronchodilator forced expiratory volume in one second/forced vital capacity of less than 70% (5). An X-ray film of abdomen in upright position was taken just in patients with abdominal distention or discomfort, vomiting, obstipation, or lack of bowel movement, and ileus was diagnosed with gaseous distention of isolated segments of bowel, vomiting, obstipation, cramps, and with the absence of peristaltic activity on the abdomen. Systolic BP of the pulmonary artery of 40 mmHg or higher is accepted as pulmonary hypertension (6). CRD is diagnosed with a persistent serum creatinine level of 1.3 mg/dL in males and 1.2 mg/dL in females. Cirrhosis is diagnosed with physical examination, liver function tests, ultrasonographic evaluation, and tissue samples in case of indication. Digital clubbing is diagnosed with the ratio of distal phalangeal diameter to interphalangeal diameter which is greater than 1.0, and with the presence of Schamroth's sign (7, 8). An exercise electrocardiogram is performed just in cases with an abnormal electrocardiogram and/or angina pectoris. Coronary angiography is taken just for the exercise electrocardiogram positive cases. So CAD was diagnosed either angiographically or with the Doppler echocardiographic findings as the movement disorders in the cardiac walls. Rheumatic heart disease is diagnosed with the echocardiographic findings, too. Avascular necrosis of bones is diagnosed by means of MRI (9). Stroke is diagnosed by the computed tomography of brain. Sickle cell retinopathy is diagnosed with ophthalmologic examination in patients with visual complaints. Eventually, prevalence of AT was detected both in the SCDs patients and in the controls, and compared in between. Mann-Whitney U test, Independent-Samples t test, and comparison of proportions were used as the methods of statistical analyses.

## Results

The study included 428 patients with the SCDs (220 males and 208 females) and 414 age and sex-matched control cases (213 males and 201 females), totally. Mean ages of the SCDs patients were similar in males and females (30.6 versus 30.1 years, respectively,  $p>0.05$ ). Mean ages of the control cases were 30.6 versus 30.3 years in males and females, respectively ( $p>0.05$  for both). Prevalence of associated thalassemia minors were similar in males and females with the SCDs (72.2% versus 67.7%, respectively,  $p>0.05$ ). Both smoking (24.0% versus 6.2%) and alcohol (5.0% versus 0.4%) were significantly higher in males with the SCDs ( $p<0.001$  for both) (Table 1). Although AT was diagnosed in 7.2% of the control cases (26 females and 4 males), this ratio was only 0.7% (just in 3 males) in the SCDs patients ( $p<0.001$ ) (Table 2). The mean ages of AT were  $33.4 \pm 10.9$  (17-56) and  $38.0 \pm 20.0$  (18-58) years in the control and SCDs groups, respectively ( $p>0.05$ ). On the other hand, transfused RBC units in their lives (47.6 versus 28.4,  $p=0.000$ ), COPD (25.4% versus 7.2%,  $p<0.001$ ), ileus (7.2% versus 1.4%,  $p<0.001$ ), cirrhosis (7.2% versus 1.9%,  $p<0.001$ ), leg ulcers (20.0% versus 7.2%,  $p<0.001$ ), digital clubbing (14.0% versus 6.2%,  $p<0.001$ ), CAD (18.1% versus 12.9%,  $p<0.05$ ), CRD (10.4% versus 6.2%,  $p<0.05$ ), and stroke (12.2% versus 7.6%,  $p<0.05$ ) were all higher in males with the SCDs, significantly. There were two cases with sickle cell retinopathy in males and one in females ( $p>0.05$ ). There were 30 mortality cases (16 males) during the ten-year follow-up period. The mean ages of mortality were  $30.8 \pm 8.3$  years (range 19-50) in males and  $33.3 \pm 9.2$  years (range 19-47) in females ( $p>0.05$ ) (Table 3). Beside these, there were four patients with HBsAg positivity (0.9%) but HBV DNA was positive in none of them by polymerase chain reaction (PCR) method. Although antiHCV was positive in 5.8% (25) of the study cases, HCV RNA was detected as positive just in three (0.7%) by PCR.

## Discussion

Chronic endothelial damage, as the most common type of vasculitis, may be the leading cause of premature aging and related morbidity and mortalities in human beings. Physical inactivity induced excess weight, smoking, alcohol, chronic inflammatory and infectious processes, and cancers may accelerate the process. Probably whole afferent vasculature including capillaries are mainly involved in the process. Much higher BP of the afferent vasculature may be the major underlying cause by inducing recurrent injuries on endothelium. Thus the term of venosclerosis is not as famous as atherosclerosis in the literature. Secondary to the chronic endothelial inflammation, edema, and fibrosis, vascular walls become thickened, their lumens are narrowed, and they lose their elastic nature and reduce blood flow and increase systolic BP further. Although early withdrawal of causative factors may retard final consequences, after development of cirrhosis, COPD, CRD, CAD, PAD, or stroke, endothelial changes cannot be reversed completely due to their fibrotic nature (10).

SCDs are life-threatening hereditary disorders affecting around 100,000 individuals in the United States (11). As a difference from other causes of chronic endothelial damage, the SCDs may keep vascular endothelium at the capillary level mainly (12), since the capillary system is the main distributor of the hard RBCs into the tissues. The hard cells induced chronic endothelial damage, inflammation, edema, and fibrosis build up an advanced atherosclerosis in much younger ages of the patients. As a result, mean lifespans of the patients were 48 years in females and 42 years in males in the literature (13), whereas they were 33.3 and 30.8 years in the present study, respectively. The great differences may be secondary to delayed diagnosis of the diseases, delayed initiation of hydroxyurea therapy, and inadequate RBC support during severe medical and surgical events in Antakya region. Actually, RBC supports must be given during all medical and surgical events in which there is evidence of clinical deterioration in the SCDs (14, 15). RBC supports decrease sickle cell concentration in the circulation and suppress bone marrow for the production of abnormal RBCs. So it decreases sickling induced endothelial damage all over the body during such events. According to our ten-year experiences, simple RBC transfusions are superior to exchange. First of all, preparation of one or two units of RBC suspensions at each time rather than preparation of six units or higher provides time for clinicians to prepare more units by preventing sudden death of such patients. Secondly, transfusion of one or two units of RBC suspensions at each time decreases the severity of pain and relaxes anxiety of the patients and families in a short period of time. Thirdly, transfusions of lesser units of RBC suspensions at each time will decrease transfusion-related complications in the future. Fourthly, transfusion of RBC suspensions in the secondary health centers prevents some deaths developed during transport to the tertiary centers for the exchange. On the other hand, longer survival of females in the SCDs (13) and longer overall survival of females in the world cannot be explained by the atherosclerotic effects of smoking and alcohol alone, instead it may be explained by higher physical and emotional stresses of male sex in life that may terminate with an exaggerated sickling and atherosclerotic process in early years of life (16, 17).

AT is an organ specific disease, characterized by lymphocytic infiltration of the gland and production of autoantibodies, directed against thyroid specific antigens (18). Iatrogenic destruction of the gland and AT represent the most common causes of adult hypothyroidism in iodine-sufficient areas (19). It is subdivided into Hashimoto's thyroiditis (chronic lymphocytic thyroiditis), Graves' disease, and painless thyroiditis, which is also called postpartum thyroiditis if it develops after birth. These subtypes may convert to each other over time. Patients may come with hypo- or hyperthyroidism and/or goiter, especially with the micronodulation (20). AT accounts for 40% of goiter cases in young adults (21). Ophthalmopathy is more common with Graves' form of the disease. Presence of TPOAb and/or TgAb together with an abnormal TSH concentration in serum is usually enough for the diagnosis. AT mainly affects middle age and elder females, therefore an abnormal TSH

**Table 1: Characteristic features of the sickle cell patients**

Variables	Male patients with SCDs*	p-value	Female patients with SCDs
Prevalence	51.4% (220)	Ns†	48.5% (208)
Mean age (year)	30.6 ± 10.1 (5-58)	Ns	30.1 ± 9.9 (8-59)
Thalassemia minors	72.2% (159)	Ns	67.7% (141)
<u>Smoking</u>	<u>24.0% (53)</u>	<u>&lt;0.001</u>	<u>6.2% (13)</u>
<u>Alcoholism</u>	<u>5.0% (11)</u>	<u>&lt;0.001</u>	<u>0.4% (1)</u>

\*Sickle cell diseases †Nonsignificant (p>0.05)

**Table 2: Comparison of the patients and control groups**

Variables	Patients with SCDs*	p-value	Control cases
Number	428	Ns†	414
Female ratio	48.5% (208)	Ns	48.5% (201)
Mean age of males	30.6 ± 10.1 (5-58)	Ns	30.6 ± 10.9 (11-55)
Mean age of females	30.1 ± 9.9 (8-59)	Ns	30.3 ± 10.3 (12-56)
<u>Prevalence of AT‡</u>	<u>0.7% (3)</u>	<u>&lt;0.001</u>	<u>7.2% (30)</u>

\*Sickle cell diseases †Nonsignificant (p>0.05) ‡Autoimmune thyroiditis

**Table 3: Associated pathologies of the sickle cell patients**

Variables	Male patients with SCDs*	p-value	Female patients with SCDs
Painful crises per year	5.0 ± 7.1 (0-36)	Ns†	4.9 ± 8.6 (0-52)
<u>Transfused RBC‡ units</u>	<u>47.6 ± 61.6 (0-434)</u>	<u>0.000</u>	<u>28.4 ± 35.8 (0-206)</u>
<u>COPD§</u>	<u>25.4% (56)</u>	<u>&lt;0.001</u>	<u>7.2% (15)</u>
<u>Ileus</u>	<u>7.2% (16)</u>	<u>&lt;0.001</u>	<u>1.4% (3)</u>
<u>Cirrhosis</u>	<u>7.2% (16)</u>	<u>&lt;0.001</u>	<u>1.9% (4)</u>
<u>Legulcers</u>	<u>20.0% (44)</u>	<u>&lt;0.001</u>	<u>7.2% (15)</u>
<u>Digital clubbing</u>	<u>14.0% (31)</u>	<u>&lt;0.001</u>	<u>6.2% (13)</u>
<u>CAD¶</u>	<u>18.1% (40)</u>	<u>&lt;0.05</u>	<u>12.9% (27)</u>
<u>CRD**</u>	<u>10.4% (23)</u>	<u>&lt;0.05</u>	<u>6.2% (13)</u>
<u>Stroke</u>	<u>12.2% (27)</u>	<u>&lt;0.05</u>	<u>7.6% (16)</u>
Pulmonary hypertension	12.7% (28)	Ns	12.5% (26)
Varices	8.6% (19)	Ns	5.7% (12)
Rheumatic heart disease	6.8% (15)	Ns	5.7% (12)
Avascular necrosis of bones	25.0% (55)	Ns	25.0% (52)
Sickle cell retinopathy	0.9% (2)	Ns	0.4% (1)
Mortality	7.2% (16)	Ns	6.7% (14)

\*Sickle cell diseases †Nonsignificant (p>0.05) ‡Red blood cell §Chronic obstructive pulmonary diseases ¶Coronary artery disease \*\*Chronic renal disease

concentration in serum is usually accepted as a proof of AT in iodine-sufficient areas (22). Autopsy studies, performed in England and USA, have shown that various degrees of thyroiditis are present in 40-45% of females and 20% of males (23). Prevalence of the two autoantibodies may reach up to 33% in females older than 70 years of age (24). It is believed that autoimmune procedure of AT is initiated by the activation of thyroid antigens specific CD4 (+) T lymphocytes (T-helpers). Although the antigen specific T-helpers could be isolated in thyroid tissues of Graves' patients, they couldn't be detected in Hashimoto's thyroiditis (25). Activation mechanism of T-helpers is still unknown.

Currently two hypotheses are thought concerning this activation mechanism. According to the first hypothesis, infections by some viruses or bacteria, carrying proteins similar to the thyroidal ones, may activate the thyroid specific T-helpers. This way is dependent upon the fact of molecular similarity. Representation of intracellular proteins to T-helpers by thyroid epithelial cells is the second hypothesis. This hypothesis is also supported by the fact that although thyroidal cells of AT patients represent major histocompatibility complex-class II (MHC-class II) proteins (HLA-DR, HLA-DP ve HLA-DQ), normal thyroidal cells don't represent them (26). These proteins are required for

representation of antigens to T-helpers. Once activated, self-reactive T-helpers may cause production of thyroidal antibodies by stimulating autoreactive B lymphocytes. Until now three antigenic targets have been detected on the thyroid. They are thyroglobulin (storage protein of thyroid hormones), thyroid microsomal antigen (thyroid peroxidase enzyme as the rate-limiting step of thyroidal hormone synthesis), and receptor of TSH. Some other antigenic structures of the thyroid and some other thyroid growth initiating immunoglobulins other than the TSH receptor stimulating ones have been mentioned and are highly suspected but they couldn't be demonstrated up to now (27). Similarly, we observed that 86.6% of cases with AT were females with a mean age of 32.5 years in the control group in the present study. So AT is a nearly seven times more frequent disease in females. Whereas we detected just three patients with AT in the SCDs patients, and all of them were males with a mean age of 38.0 years. In other words, we were not able to detect any female patient with AT in the SCDs group, and the prevalence of AT was significantly lower in the SCDs than the age and sex-matched controls with unknown mechanisms, yet (0.7% versus 7.2%,  $p < 0.001$ ).

SCDs are severe inflammatory processes terminating with significant health problems in both genders (28). For example, menarche is significantly retarded in females with the SCDs (29). Additionally, the severe chronic inflammation all over the body causes an overlapping chronic disease anemia. Furthermore, end-organ insufficiencies can even suppress the immune system of the patients. Acute sinusitis, tonsillitis, and urinary tract infections are the common causes of acute painful crises and hospitalizations, and they can easily progress into the severe and life-threatening infections including pneumonia, meningitis, and sepsis due to the relative immunodeficiency in such patients (30). Tonsillary hypertrophy is a frequent physical examination finding that may be a result of a prolonged infectious process due to the relative immunodeficiency of the patients (31). Severe and prolonged endothelial inflammation induced prominent weight loss and cachexia are also common in them (4). Autosplenectomy, recurrent painful crises, frequent hospitalizations, invasive procedures, red blood cell supports, medications, prevented normal daily physical activities, and an eventually suppressed mood of the body can even suppress the normal immune system of the body (32, 33). In another definition, SCDs may cause moderate to severe immunosuppression in the human body that may be the cause of significantly reduced prevalence of AT in the SCDs in the present study.

As a conclusion, SCDs are severe inflammatory processes on vascular endothelium at the capillary level, terminating with accelerated atherosclerosis induced end-organ failures and a shortened survival in both genders. Beside that, SCDs may cause moderate to severe immunosuppression by several mechanisms in the human body that may be the cause of significantly reduced prevalence of AT in the SCDs.

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# On the relationship between teachers' behavior and corporal punishment: Lessons, implications, and recommendations

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## Abstract

The current study investigates gender differences between teachers with respect to their behavior towards corporal punishment in government primary schools in Khyber Pakhtunkhwa (KP), Pakistan. Quantitative methodology has been employed for the analysis of the research problem. Consistent with quantitative methodology, survey strategy and random sampling technique was employed. Data was collected through structured questionnaires from respondents. Descriptive analysis was conducted on collected data. The findings reveal that male and female teachers both show positive behavior towards corporal punishment at government primary schools. However, male teachers show more positive behavior than female teachers towards corporal punishment which implies that female teachers should be appointed at the primary school level in preference to men who engage in corporal punishment, in order to provide a healthy and free from corporal punishment learning environment for students.

**Key Words:** Corporal punishment, teacher behavior, Male and female teachers, primary schools, Pakistan

## Introduction

Education plays a very important role in the development of new nations. The purpose of education is not to domesticate but to liberate the human mind. Notably, all the developed nations in the world have initially developed their educational systems and social security. It is essential for a successful educational system to develop policies, practices, and procedures aligned to each other from top to bottom. In terms of policies in the contemporary world, the primary concern of every nation is the economic development followed by respective ideology such as, regional, national, and international interests. The underlying policies correspond to structures controlling and regulating educational practices in a given society. Educational practices are often imposed by administrative and academic representatives in a specific educational institution. The perceptions of both learners and teachers regarding policies and practices have been a subject matter of research across the domain of educational psychology in the recent years.

The aim of this research is to investigate the perception of learners regarding the behavior of male and female teachers towards corporal punishment in government primary schools at district Mardan, KPK, Pakistan. This research is important in highlighting the level, type, and extent of corporal punishment in the government schools in the targeted population of the learners in their respective area. The research is important in bringing into

consideration such inhumane and outdated practices in a remote and economically underprivileged area coping with the existing deteriorating educational condition of the common people. This research is also important in describing the lack of professional education and training of the teachers towards awareness of psychological developments in students.

The researcher employed quantitative research methodology to present the result of the present study. In this regard, quantitative data is collected from the respondents through structured questionnaire and the respective data is analyzed in terms of means, variance, and standard deviation via SPSS software.

## Literature review

This section is divided into three sub-sections i.e. review of related literature on corporal punishment in the world and review of literature related to corporal punishment in Pakistan, and conceptual framework.

### Corporal Punishment

The review of literature on corporal punishment suggests that violence ultimately generates violence. According to Nasr (2004), victims of corporal punishment exhibit violence towards teachers and other students. Specifically, he notes that 58% of students open to corporal punishment are those who show more violence in schools than other students. These violent acts include damage to school property, writing on walls and beating other fellows. The proponents of corporal punishment argue that it is used to control the behavior and maintain discipline in the schools. Similarly, Shehab (2004) argues that the majority of students fail their subjects and drop out from schools due to corporal punishment. Apart from that physically punishing students out of the class also make the students escape from school before the due time (Zayed & Nasr, 2004).

According to a report of UNICEF (2002), an increasing number of school children experience corporal punishment. Zayed (2007) in his study confirms that 90% of his study sample experienced beatings at home and 42% of his study samples confirmed corporal punishment in their respective schools in Egypt. Moreover, El Wady (2010) reveals that no positive actions are taken against teachers who practice corporal punishment in schools by the administration. In addition, Jehle (2004) states that on an international level parents and teacher who had previously received corporal punishment are highly likely to approve the use of it on other children. According to National Criminal Magazine (2007, Asian students experience more violence than students in central Europe.

### Corporal Punishment in Pakistan

On corporal punishment in Pakistan, the study of Shaukat (2013) reveals that 20% of teachers and 40 % of parents showed strong approval for mild corporal punishment in the school. However, the practice of mild corporal punishment has been partially approved by 40% of teachers and

38% of parents respectively. Similarly, strong support for justification of corporal punishment has been exhibited as evidence by 75% of teachers and 84% of parents. In the same vein, 85% of parents and 65% of teachers suggested corporal punishment for stealing and violations of school's rules and regulations respectively. Moreover, no harmful effects of corporal punishment on students, is believed by 20% of teachers strongly and 31% partially agreed. From the students' perspective, 24% and 22% of students admitted having received corporal punishment via stick or ruler, and slaps in the face or head respectively.

In a survey conducted on students between the ages of 12 to 17 years during October, 2013 and March, 2014, it has been reported that 44% of students have witnessed corporal punishment at the hands of their teachers in the last six months. It has been also be reported that out of all such incidents of corporal punishment reported to 20% of parents and 18% of teachers, no action has been taken in 66% of cases. The teachers and parents in the survey reported that corporal punishment is on the decline in Pakistan. Nevertheless, the students reported that it is still in practice against those who commit mistakes. Furthermore, the teachers exhibited belief in corporal punishment for academic achievement amongst the students (Plan International, 2014)

Shaukat (2013) addresses the issues of high school dropouts in Pakistan. She states in the light of the report of the Society for the Protection of the Rights of the Child (SPARC) that 35,000 students approximately drop out of high schools due to corporal punishment in Pakistan. Bari (2012) comments on the results of a study published in a report (Child Rights Movement Punjab, 2013). According to her, 89% of public and private schools in Punjab province are practicing corporal punishment against the students through their teaching staff. The frequency of corporal punishment was highest in public schools, followed by private schools and then religious madrasas. Similarly, Kundi (2012) reports a survey conducted in KPK province by Society for the Protection of the Rights of the Child (2011), it is reported that 76% parents in districts Peshawar, Swabi, Nowshera, Charsada and Mardan districts strongly agreed on corporal punishment.

### Corporal punishment in KPK Pakistan

Despite a ban on corporal punishment by the KP government, it still prevails in the practice in the schools. Study conducted by Muhammad & Ismail (2001) reveals that the corporal punishment inclination among school heads is still high as evidenced by 57.3% heads of school who showed approval for corporal punishment. However, 41.3% of head of teachers considered corporal punishment unnecessary. On the part of parents, 40.6% and 29.5% parents approved corporal punishment for facilitating learning, and maintaining discipline respectively. On the other hand, 26.8% think corporal punishment as a wrong practice but inevitable. Although 78.1% of parents reported corporal punishment in school that is confirmed by a mere 40% of heads of school. This implies a deliberate attempt of under-reporting of corporal punishment.

Muhammad & Ismail (2001) report that school discipline, learning facilitation, disobedience, and character building motives induce teachers to inflict corporal punishment. Similarly, disinterest in studies, use of abusive language, misbehavior, fighting, and skipping classes are identified as reasons for infliction of corporal punishment (Save the Children & UNICEF, 2005). Moreover, it reports other factors responsible for inflicting corporal punishment include lack of facilities, culture, vague law, and abiding by sayings of Prophet Muhammad (PBUH).

The practice of corporal punishment is induced to discipline and correct the behavior of children. It is considered as accepted practice by parents, children and adults provided it is done for a good purpose. The support for corporal punishment of some religious scholars make parents teach their children to believe that corporal punishment is aimed at their betterment therefore should be accepted (Save the Children & UNICEF, 2005). Even the prior report of UNICEF (2001) revealed the prevalence and acceptance of corporal punishment in Pakistan. Many religious scholars, particularly at religious schools, have been reported to misquote some sayings of Muhammad (PBUH), for instance, forgiving the use of violence against children. On the contrary, they forget other related sayings of Muhammad (PBUH), for instance, the sayings that call for treatment of children with love and care.

Overload of teaching could be one possible reason that induces corporal punishment. This is evidenced by the state of under-staffed schools and increased strength of class size, with sometimes more than 100 students per class (Save the Children & UNICEF, 2005). Some shocking incidents have been reported by Muhammad & Ismail (2001) about the extreme corporal punishment. For instance, rendering unconscious, receiving stitches on severe cuts, fractured hands, and broken teeth etc. Overall, they noted 74 out of 630 parents reported incidents of severe corporal punishments. Similarly, Save the Children & UNICEF (2005) report that 3,582 students complained/ admitted that they had been punished severely resulting in serious injuries. More to the point, Cheema (2007) reported that two students died and eighteen received serious injuries due to corporal punishment in school.

## Conceptual framework

In this section, the variable of the framework and related context are defined and discussed. These concepts are as under:

### Primary School Level

Primary schooling in Pakistan corresponds to the first five grades of the child learners. A successful completion of primary education leads to a middle school (6th - 8th grade), or high school (6th-10th grade). The age of students in primary school varies between 5-8 years in the start and 10-13 years in Pakistan. Boys' primary schools are exclusively for boys and they are administrated by male staff whereas girls primary schools are solely for girls and these schools are run by female staff in the public sector in Pakistan.

### Corporal Punishment

In educational psychology in general and in the context of the present study in particular, corporal punishment is referred to as the utilization of force to inflict discomfort or pain for the correction, discipline, and control of a student. Physical coercion is initiated through various means i.e. hitting the student with an object like a stick or ruler, hitting the student with hand over face or other parts of the body, shaking the students, kicking the students and using all other painful ways.

### Behavior

In the general sense, behavior can be defined as the way a person behaves or functions in a particular situation. In the context of the present study behavior refers to the manner/function of teachers in the affairs of schooling the children such as, correcting, disciplining and improving the academic situation of the students.

## Methodology

This section briefs the design of the study, target population, sample, measurement instrument, and data collection technique followed by validity and reliability of the data.

### Design of the Study

The aim of the present study was to analyze gender differences of the teachers in relation to their behavior towards corporal punishment in public primary schools of district Mardan region, KPK, Pakistan. The present study incorporates quantitative methodology for the analysis of the research problem under consideration. The present study utilizes survey methodology. Through random sampling technique, data is collected through questionnaire and then analyzed statistically in terms of describing means, variance and standard deviation as to describe the frequency of the different variable.

### Population

The population of the current study comprises =learners from government primary schools in Mardan region, KPK, Pakistan. In this regard, five males and five females' primary schools are selected for data collection.

### Sample and Participants

The researcher has utilized random sampling technique for the collection of data from the respondents. The participants for the present study were 200 learners from 5 male and 5 female government primary schools in district Mardan, KPK, Pakistan.

### Instrumentation for measuring behavior of teachers regarding inflicting corporal punishment

For the purpose of data collection about the behavior of teachers regarding infliction of corporal punishment, a standardized scale is used namely scale for measuring behavior of teachers regarding inflicting corporal punishment. This scale has also been used by Ali (2012) for measuring teachers' behavior regarding inflicting corporal punishment at secondary level.

**Data Collection**

Data has been collected from learners through structured questionnaire. The questionnaire is divided into three sections. The first section of the questionnaire accounts for the demographic information of the students. The second section of the questionnaire targets the demographic information of the teacher and the school where she/he is teaching. The third section of questionnaire provides the statements regarding the behavior of the teachers towards corporal punishment. The students are asked to tick amongst sometimes, always and never in front of 12 statements/questions.

**Validity**

The scale has been already validated by seven subject experts having qualifications of PhD.

**Reliability**

The Cronbach alpha for this scale is 0.83 that indicates acceptable level of reliability.

**Data Analysis**

The researcher has analyzed the data in terms of percentages, means, variance and standard deviation as to describe the frequency of various items in the questionnaire statistically. The results are then presented for discussion.

## Results and Discussion

**Analysis of Statement 1**

Statement 1 shows the responses of the respondents about punishment through slapping.

Table 1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never	56	28.0	28.0	28.0
Sometimes	143	71.5	71.5	99.5
Always	1	.5	.5	100.0
Total	200	100.0	100.0	

**Discussion**

Table 1 shows that .5% of the respondents were of the view that they had never been punished by slapping while 71.5% were of the view that they were sometimes corporally punished through slapping, while only 28% said that they had always been punished through slapping.

**Analysis of Statement 2**

Statement 2 shows the responses of the respondents about punishment through beating with stick.

Table 2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never	107	53.5	53.5	53.5
Sometimes	93	46.5	46.5	100.0
Total	200	100.0	100.0	

**Discussion**

Table 2 shows that 53.5% of the respondents were of the view that they had never been punished by beating with stick while 46.5% were of the view that they were sometimes corporally punished through beating with a stick.

**Analysis of Statement 3**

Statement 3 shows the responses of the respondents about punishment through kicking.

**Table 3**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never	199	99.5	99.5	99.5
Sometimes	1	.5	.5	100.0
Total	200	100.0	100.0	

**Discussion**

Table 3 shows that 99.5% of the respondents were of the view that they had never been punished by kicking while 0.5% were of the view that they were sometimes corporally punished through kicking.

**Analysis of Statement 4**

Statement 4 shows the responses of the respondents about punishment through blowing/punching.

**Table 4**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never	196	98.0	98.0	98.0
Sometimes	4	2.0	2.0	100.0
Total	200	100.0	100.0	

**Discussion**

Table 4 shows that 98% of the respondents were of the view that they had never been punished by blowing/punching while 2% were of the view that they were sometimes corporally punished through blowing/punching.

**Analysis of Statement 5**

Statement 5 shows the responses of the respondents about punishment through pulling hair

**Table 5**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never	198	99.0	99.0	99.0
Sometimes	2	1.0	1.0	100.0
Total	200	100.0	100.0	

**Discussion**

Table 5 shows that 99% of the respondents were of the view that they had never been punished by pulling hair while 1% were of view that they were sometimes corporally punished through pulling hair.

**Analysis of Statement 6**

Statement 6 shows the responses of the respondents about punishment through pulling ears.

**Table 6**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never	132	66.0	66.0	66.0
Sometimes	68	34.0	34.0	100.0
Total	200	100.0	100.0	

**Discussion**

Table 6 shows that 66% of the respondents were of the view that they had never been punished by pulling ears while 34% were of view that they were sometimes corporally punished through pulling ears..

**Analysis of Statement 7**

Statement 7 shows the responses of the respondents about punishment through "Murgha banana": a stress position, assuming the position of a cock/rooster.

**Table 7**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never	114	57.0	57.0	57.0
Sometimes	86	43.0	43.0	100.0
Total	200	100.0	100.0	

**Discussion**

Table 7 shows that 57% of the respondents were of the view that they had never been punished by Murgha banana (assuming the position of a cock). While 43% were of view that they were sometimes corporally punished through Murgha banana (assuming the position of a cock).

**Analysis of Statement 8**

Statement 8 shows the responses of the respondents about punishment through being made to stand and stretching their arms upwards.

**Table 8**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never	140	70.0	70.0	70.0
Sometimes	60	30.0	30.0	100.0
Total	200	100.0	100.0	

**Discussion**

Table 8 shows that 70% of the respondents were of the view that they had never been punished by being made to stand and stretching their arms upwards while 30% were of view that they were sometimes corporally punished through making to stand and stretching their arms upwards.

**Analysis of Statement 9**

Statement 9 shows the responses of the respondents about punishment through standing on the bench and facing the class.

**Table 9**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	199	99.5	99.5	99.5
	Sometimes	1	.5	.5	100.0
	Total	200	100.0	100.0	

**Discussion**

Table 9 shows that 99.5% of the respondents were of the view that they had never been punished by standing on the bench and facing the class, while 0.5% were of view that they were sometimes corporally punished through Standing on the bench and facing the class.

**Analysis of Statement 10**

Statement 10 shows the responses of the respondents about punishment through making sit-stand

**Table 10**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	127	63.5	63.5	63.5
	Sometimes	73	36.5	36.5	100.0
	Total	200	100.0	100.0	

**Discussion**

Table 10 shows that 63.5% of the respondents were of the view that they had never been punished by making them sit-stand while 36.5% were of view that they were sometimes corporally punished through making them sit-stand.

**Analysis of Statement 11**

Statement 11 shows the responses of the respondents about punishment through asking two students to continuously slap each other on face.

**Table 11**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	199	99.5	99.5	99.5
	Sometimes	1	.5	.5	100.0
	Total	200	100.0	100.0	

**Discussion**

Table 11 shows that 99.5% of the respondents were of the view that they had been never punished by asking two students to continuously slap each other on face. While .5% were of view that they were sometimes corporally punished through asking two students to continuously slap each other on face.

## Analysis of Statement 12

Statement 12 shows the responses of the respondents about punishment through Pushing or shaking.

**Table 12**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid never	200	100.0	100.0	100.0

## Discussion

Table 12 shows that 100% of the respondents were of the view that they had never been punished by Pushing or shaking

## Summary of Findings

The present study focused on the behavior of male and female teachers towards corporal punishment in government primary schools situated in district Mardan, KPK, Pakistan. Following is the summary of findings of the study:

1. 5% percent of the respondents had never been punished by slapping while 71.5% were sometimes corporally punished through slapping. On the other hand, 28% had never been punished through slapping.
2. 53% of the respondents had never been punished by beating with stick while 43.5% were sometimes corporally punished through beating with stick.
3. 99.5% of the respondents had never been punished by kicking while 0.5% were sometimes corporally punished through kicking.
4. 98% of the respondents had never been punished by blowing/punching while 2% were sometimes corporally punished through blowing.
5. 99% of the respondents had never been punished by pulling hair while 1 % were sometimes corporally punished through pulling hair.
6. 66% of the respondents had never been punished by pulling ears while 34% were sometimes corporally punished through pulling ears.
7. 57% of the respondents had never been punished by 'murgha banana' (a stress position assuming the position of a cock) while 43 % were sometimes corporally punished through 'murgha banana'.
8. 70% of the respondents had never been punished by making them stand and stretching their arms up while 30 % were sometimes corporally punished through being made to stand and stretching your arms up.
9. 99.5% of the respondents had never been punished through standing on the bench and facing the class while 0.5% were sometimes corporally punished through standing on the bench and facing the class.
10. 63.5% of the respondents had never been punished by being made to sit-stand while 36.5% were sometimes corporally punished through being made to sit-stand.
11. 99.5% of the respondents had never been punished by asking two of the students to continuously slap each other on face while 0.5% were sometimes corporally punished through, asking two of the students to continuously slap each other on the face.
12. 100% of the respondents had never been punished by pushing or shaking.

## Descriptive Statistics for Measures

	Statement 1	Statement 2	Statement 3	Statement 4	Statement 5	Statement 6	Statement 7	Statement 8	Statement 9	Statement 10	Statement 11	Statement 12
N Valid	200	200	200	200	200	200	200	200	200	200	200	200
Missing	0	0	0	0	0	0	0	0	0	0	0	0
Mean	1.7250	1.4650	1.0050	1.0200	1.0100	1.3400	1.4300	1.3000	1.0050	1.3650	1.0050	1.0000
Std. Deviation	.45872	.50003	.07071	.14035	.09975	.47490	.49632	.45941	.07071	.48264	.07071	.00000

## Conclusion

The study concludes that irrespective of gender both males and females tend to employ corporal punishment. However, the gender seems to moderate the relationship between male and female teachers' behavior towards corporal punishment as male teachers exhibit more inclination towards corporal punishment. This implies that female teachers should be appointed at the primary school level in preference to men who engage in corporal punishment to foster a healthy and corporal-punishment-free learning environment to school children.

## Recommendations

On the basis of the research findings in the present study, the following recommendations are made:

- i. It is recommended that female teachers should be appointed at primary level as they show little or no tendency towards corporal punishment.
- ii. The education department should devise an explicit policy on corporal punishment and other humiliating treatment of learners.
- iii. The education department should also devise a policy on implementing the legislative laws against corporal punishment in both public and private schools.
- iv. Guidance and counseling committees should be introduced in the primary schools instead of corporal punishment that should give advice and study the psychological problems of students.
- v. The teacher training curriculum should include modules on the negative effects of corporal punishment on the mental and psychological development of children. Teachers should also be trained in alternative method of disciplines.
- vi. The teacher should acquire knowledge about modern teaching methods to provide healthy environment to the students free from corporal punishment.

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