

KNOWLEDGE, ATTITUDES, REPORTED DENTAL EXPERIENCE AMONG POSTGRADUATE DENTAL STUDENTS REGARDING PHYSICALLY DISABLED PATIENTS

A Cross-Sectional Study

Essraa M. Soliman^{1*} BDS, Azza G. Hanno² PhD, Ahmed A. Mohamed² PhD

ABSTRACT

INTRODUCTION: special care dentistry (SCD) is concerned with oral health of people with disability. Research data on the awareness of postgraduate dentists regarding the management of patients with special health care needs (SHCN) is limited in Egypt.

OBJECTIVES: The aim was to assess knowledge, attitude and reported practices of postgraduate dentists regarding physically disabled patients in the Faculty of Dentistry, Alexandria University.

MATERIAL AND METHODS: This study was based on a cross sectional, analytical design. The questionnaire conducted on sample of postgraduate dental students at the Faculty of Dentistry Alexandria University during six months (August 2019 - January 2020). The participants were asked to complete a comprehensive, close-ended self-administered questionnaire on Special Needs Patients especially the physical disabled. The questionnaire was consisted of 42 items in four sections. The first section was concerned with subject's demographic. The second and third sections enquired about the participants' knowledge, attitudes and management. The fourth section assessed the respondents' actions taken to manage SNP. Multivariable regression analysis was carried out to determine the effect of different factors on knowledge, attitudes and practices scores.

RESULTS: The study participants (sample size= 251 out of 435 postgraduate students with a response rate of 90.6%). According to regression analysis pedodontics, dental public health and dental materials showed significantly higher knowledge score than periodontology, oral medicine and radiology (0.77 (0.10, 1.44)).

CONCLUSIONS: There is a need to increase dentists' awareness regarding SNP and designing appropriate training programs to enhance their practices towards management of these patients.

KEYWORDS: Special needs dentistry (SND), knowledge, attitude, practice, and postgraduate dentists.

RUNNING TITLE: Knowledge, Attitude, and Practices of Dental postgraduates regarding SND.

1 Bachelor of Dental medicine and surgery 2006, Faculty of Dentistry, Alexandria University, Egypt.

2 Professor of Dental Public health, Faculty of Dentistry, Alexandria University, Egypt.

***Corresponding author:**

E-mail: esraasoliman@yahoo.com

INTRODUCTION

Patients with special health care needs (SHCN) are defined as those experiencing specific physical, medical, societal or psychological obligations to modify the conventional dental procedures in order to achieve adequate treatment (1). Individuals with disabilities which originated from oral function or structure impairment, environmental factors or any other condition that impacts the oral health are all categorized as Special Care Dentistry (SCD) individuals (2).

The Central Agency for Public Mobilization and Statistics (CAPMAS) reported that the percentage of the disabled in the Egyptian society has increased by the year 2017 to (10.67%) of the total population (3) (4). Although faculty of dentistry in Alexandria University is among the settings responsible for delivering standard oral health services to the population of Alexandria; including those with special needs, no recent studies assessed knowledge,

attitudes and reported experiences among its postgraduate students.

Many studies have shown that individuals with special needs have limited access to dental clinics in contrast to the general population. This might be due to their disability itself or other financial struggles (5).

Special needs patients' (SNP) treatment requires a special set of skills from various medical fields and not just limited to the dental skills; for example, the dentist must be qualified while dentally treating SNP in order to achieve a comprehensive successful treatment (6).

A study conducted in Saudi Arabia showed that special needs dental patients were treated by dental pediatric dentists only. In addition, there were no dental programs or courses that address this dental branch except in pediatric dentistry curriculum (7).

Another study examined undergraduate education in Special Needs Dentistry (SND) in Australia and Malaysia revealed that the number of dental schools in Malaysia

teaching SND as a specific discipline was relatively low compared to that of Australia. However, a high percentage of Malaysian and Australian dental schools reported incorporating teaching of SND into pediatric dentistry (8). The requirement for Special Care Dentistry in the undergraduate curriculum is limited in many countries as proved in literature review in different nations. This has resulted in dentists feeling poorly prepared to provide dental care services for people with disability (9).

One of the most significant drawbacks that negatively influenced the provision and accessibility of oral health care for special needs patients was commonly the lack of preparedness and willingness of the dentists to treat SNP (10).

The integration of the special need community into the dental practice is considered a necessity, and in order to achieve such an aim, dentists need to be trained and educated to develop an adequate set of skills and a broad area of knowledge (11).

To our knowledge, there are no studies in Egypt assessing knowledge, attitudes and reported experiences among postgraduate dental students and as reported by (CAPMAS) (4). The percentage of the disabled in the Egyptian society has increased. Therefore, the present study aimed at assessing the knowledge, attitudes and practices experience of a sample of postgraduate dentists regarding management of physically disabled people. Such information might be useful not only from the descriptive standpoint, but it may also help to identify important areas for future research.

MATERIAL AND METHODS

Ethical consideration

The study was conducted after receiving the approval of the Research Ethical Committee at Faculty of Dentistry, Alexandria University (IRB NO: 00010556-IORG 0008839).

The objective of the study was thoroughly explained to the participants in order to seek their permission. They were also assured about the confidentiality of the collected data as well as their right to withdraw with no penalties.

Return of the questionnaire was taken as an implied consent to participate in the study.

Study design

A cross sectional analytical design was adopted

The minimal sample size is calculated based on a previous study aimed to assess and evaluate the confidence of the dental team in Irish dental schools regarding their training in the field of special care dentistry (SCD), where the percentage of dental students with adequate confidence was 79%. (12) By using a power of 80%, precision 5% and significance level of 95% ($\alpha=0.05$), the minimal required sample size was found to be 251. Sample size will be increased to 277 to make up for non-response bias (13). At the time of data collection all postgraduate dental students in different departments of the faculty of Dentistry Alexandria University were approached.

A comprehensive questionnaire was specially designed for the present study. It was based on the intensive literature review (12, 14).

The final questionnaire was consisted of four sections, closed questions formats, to explore the participants' following data:

Section one: enquired about the socio-demographic data including age, gender and educational related data such as whether they received theoretical information or sufficient clinical training concerning SCD. Section two: assessed the knowledge of the postgraduate dental students gained from their postgraduate dental education regarding classification of special needs patients and how they manage physically disabled patients through multiple questions related to their awareness of any abnormal dental findings associated with physical disability, If the dentists have any information regarding the basic sign language used with deaf patient, if they have need to prescribe sedatives when dealing with Physically Disabled patients who require long appointments and if they have aware of the necessary tools to help treating physically disabled patients

The respondents were asked to fill in the blanks with one of the offered possible choices namely yes, no or uncertain.

Section three: assessed students' attitudes toward their educational experience with special reference to their confidence in treating Physically Disabled patients were assessed by multiple questions evaluating their feeling while treating special needs patients, if they believed that hands on clinical training regarding physically disabled is mandatory for undergraduate dental students and also if they are apprehensive about treatment consequences than with normal people.

Section four: assessed the self-reported dental practices regarding people with especially physically impairment.

Assessment was carried out through questions concerning receiving any clinical training regarding dealing with special needs patients, if the faculty provides clinic facilities to facilitate movement of physically disabled patients around and how he communicated with this patients.

A pilot study was conducted on 40 postgraduate students to ensure clarity and consistency of the questions. The internal consistency (Cronbach α) was calculated for each of the 3 domains of the questionnaire. Cronbach's alpha was equal to 0.67 for Knowledge section, 0.59 for attitude section and 0.72 for reported practice section denoting acceptable reliability. In addition, content validity was examined by six staff members of the Faculty of Dentistry in Alexandria University. The experts evaluated every item in the questionnaire for validity, the content validity index (CVI) was 0.8 and the content validity ratio (CVR) was 0.7 denoting very high score.

Data were collected in six months (From August 2019 to January 2020) by the researcher from the different departments of the faculty of Dentistry Alexandria University, were either obtained from the filled questionnaire on the same day, or left to each department secretary, to be collected and processed at a later date.

Statistical analysis

Data were fed to the computer using statistical package for social sciences (SPSS for Mac OS X, version

20.0, Inc. Chicago, IL, USA) was carried out by two stages:

Firstly, normality was checked using descriptive statistics, plots (histogram and boxplots) and Kolmogorov–Smirnov test of normality. Then descriptive statistics were displayed as mean \pm standard deviation for quantitative variables such as age and average years of practice, while frequencies and percentages were used for qualitative variables such as gender, graduation year, and specialty, received previous academic theoretical information, received sufficient clinical training and seminars on clinical observations concerning physically disabled patients.

Secondly, each of the scores of overall Knowledge, attitudes and reported practices were analytically compared according to the mentioned variables. Student t-test was used to compare mean scores between 2 groups. One-way ANOVA was used to compare the mean scores between 3 groups and more, followed by Post Hoc test (Tukey) for multiple comparisons. Significance was set at the 5% level ($P \leq 0.05$).

The scoring for knowledge section, the correct answers were given a score 1 and the wrong ones scored 0. Regarding attitudes and reported practice scores, favorable answers assigned a score 1 & unfavorable answers scored 0.

Multivariable regression analysis was carried out to determine the effect of different factors on knowledge, attitudes and practices scores of dental postgraduate students towards physically disabled patients. Significance was set at ($P \leq 0.05$).

RESULTS

The initially approached sample consisted of 300 questionnaires, returned back 265 filled ones, giving a response rate of 88%. Demographic data and personal characteristics of the responding dentists were presented in Table (1). Table (2) showed the relations between total knowledge, attitude and practice scores regarding physically disabled patients and the independent variables.

Almost 56% of the sample consisted of females and those who graduated in the period from (2010-2015) accounted for 63.3%. Nearly one third (37%) of the respondents belonged to the conservative and prosthodontics specialties, whereas dental public health, pedodontics and orthodontics specialties represented 22.3%. The oral surgery specialty represented 25.1% and the oral biology, oral pathology and biomaterials fields accounted for 4.8%. Periodontology, radiology and oral medicine fields accounted for 10.4%.

Post hoc comparisons using the Tukey HSD test indicated that the knowledge and reported practice mean \pm SD scores for the pedodontics, dental public health and orthodontic specialties (4.68 ± 1.55 , 6.14 ± 2.51 , respectively) were significantly higher than all other specialties.

With regard the previous academic theoretical information regarding SND, the majority of the participants responded positively (68.1%). Nearly (6.8%) were uncertain, whereas 25.1% responded negatively.

Concerning whether dentists received sufficient clinical training or not, 19.9% responded positively whereas 15.9% responded as being uncertain. The rest of the participants responded negatively making (64.1%) of the participants. Regarding their conception of the adequacy of received information in terms of clinical exposure to physically disabled patients, almost half of the participants (47%) responded negatively.

Concerning the relation between independent variables and knowledge, attitudes and reported practices scores, postgraduate dentists graduated between the year 2010 to 2015, showed no statistically significant differences ($P=0.20$, $P=94$, $P=0.39$, respectively). It has been shown that pedodontics, dental public health and orthodontic specialties showed highest knowledge and practice mean \pm SD scores (4.68 ± 1.55 and 6.14 ± 2.51 , respectively), and their mean scores differed significantly ($P < 0.001$, $P=0.004$ respectively).

The positive responses regarding the academic theoretical information showed the highest scores regarding knowledge, attitude and practices. However, scores differed significantly only in knowledge and reported practices ($P < 0.001$, $P=0.001$ respectively). Regarding the mean positive responses concerning having received sufficient clinical training and adequate information in clinical seminars of physically disabled patients, the data showed the highest knowledge and practices mean scores significantly ($P < 0.001$).

According to dental postgraduate student's knowledge around 87.6% of the study sample reported that they know that special needs include types other than mental.

When asked about considering patients were using some medical treatment is considered as special needs patients only, 67.7% responded positively.

When participants were asked whether they felt comfortable treating special needs patients, approximately half of the participants disagreed (50%), whereas, when asked whether they felt sorry for special needs patients; the majority answered positively (88%).

Only 18.3% of the participants answered positively about communication with deaf patients who only understand sign language, and 33.9% of the participants apply methods necessary to communicate with deaf patients and allow them to see the instruments, and demonstrate how they work (Tell, show, Do method). The majority (73.3%) reported that they refer physically disabled patients to specialists.

Table (3) showed multivariable regression of the different variables related to knowledge, attitudes and practices scores of dental postgraduate students towards physically disabled patients.

It was found that average years of practice was found to be significant only with reported practice scores ($P= 0.029$, 95% CI= 0.20 (0.02, 0.38)).

Concerning specialties, pedodontics, dental public health and dental materials showed significant difference in the knowledge scores only of 0.77 points higher than the periodontology, oral medicine and radiology ($P= 0.024$, 95% CI= 0.10-1.44).

The score of the participants who responded negatively about their previous academic theoretical information, were significantly lower than those who positively responded by 0.84 points ($P = <0.0001$, 95%CI= -1.25, -0.43).

The scores for the rating sufficient clinical training showed a highly significant difference in relation to knowledge, whereas scores of negative rating of clinical training were lower significantly by 1.35 points ($P = <0.0001$, 95%CI= -1.87, -0.84).

Significant difference was also shown in the rating related to receiving adequate information in clinical observation, whereas participants who responded negatively their score was lower by 0.53 points ($P = <0.0001$, 95%CI= -0.98, -0.82).

Received sufficient clinical training in relation to report practices showed a highly significant difference between responded negatively and those who responded positively, the negative responses were lower by 2.00 points ($P <0.0001$, 95%CI= -2.93, -1.07).

Table (1): Descriptive data of the percentage distribution of study sample according to sociodemographic, professional and work characteristics of the participants.

Variable	n = 251
Age (mean ± SD)	29.4 ± 3.6
Average years of practice (mean ± SD)	6.4 ± 3.6
Gender	
Males: n (%)	109 (43.4)
Females: n (%)	142 (56.6)
Graduation year	
< 2010: n (%)	60 (23.9)
2010 - 2015: n (%)	159 (63.3)
> 2015: n (%)	32 (12.7)
Specialty	
Conservative dentistry & Prosthodontics: n (%)	94 (37.5)
Pedodontics, dental public health & orthodontics: n (%)	56 (22.3)
Oral surgery: n (%)	63 (25.1)
Oral biology, oral pathology & dental materials: n (%)	12 (4.8)
Periodontology, Oral medicine & Radiology: n (%)	26 (10.4)
Previous academic theoretical information regarding SND	
Yes: n (%)	171 (68.1)
Uncertain: n (%)	17 (6.8)
No: n (%)	63 (25.1)
Sufficient clinical training	
Yes: n (%)	50 (19.9)
Uncertain: n (%)	40 (15.9)
No: n (%)	161 (64.1)
Adequate information on clinical observation of physically disabled	
Yes: n (%)	91 (36.3)
Uncertain: n (%)	42 (16.7)
No: n (%)	118 (47)

Table (2): Mean dental knowledge, attitudes and reported practice scores of study sample regarding SND in relation to different variables.

Variable (s)		Knowledge Scores		Attitude Scores		Practice Scores	
		Mean ± SD n = 251	P Value	Mean ± SD n = 251	P Value	Mean ± SD n = 251	P Value
Gender [‡]	Males	3.87 ± 1.82	0.87	4.61 ± 1.09	0.14	5.17 ± 3.21	0.84
	Females	3.91 ± 1.68		4.68 ± 0.99		5.10 ± 2.62	
Graduation year [‡]	< 2010	3.57 ± 1.90	0.20	4.77 ± 1.02	0.94	4.77 ± 2.70	0.39
	2010 - 2015	4.03 ± 1.70		4.72 ± 1.06		5.32 ± 2.90	
	> 2015	3.81 ± 1.56		4.69 ± 1.18		4.88 ± 2.54	
Specialty [‡]	Conservative dentistry & Prosthodontics	3.88 ± 1.84 [§]	<0.001 [†]	4.66 ± 1.24	0.62	4.66 ± 3.38 [§]	0.004 [†]
	Pedodontics, dental public health & orthodontics	4.68 ± 1.55 [‡]		4.73 ± 1.05		6.14 ± 2.51 [‡]	
	Oral surgery	3.67 ± 1.62 [§]		4.81 ± 0.86		5.48 ± 2.36 [§]	
	Periodontology, Oral medicine & Radiology	3.42 ± 1.60 [§]		4.42 ± 0.90		3.42 ± 1.98 [§]	
	Oral biology, oral pathology & dental materials	2.5 ± 1.09 [§]		4.73 ± 0.89		4.02 ± 2.48 [§]	
Previous academic theoretical information regarding SND [‡]	Yes	4.33 ± 1.62	<0.001 [†]	4.75 ± 1.09	0.67	5.53 ± 3.02	0.001 [†]
	No	2.95 ± 1.61		4.49 ± 1.05		4.29 ± 2.39	
Sufficient clinical training [‡]	Yes	5.52 ± 1.64	<0.001 [†]	4.70 ± 1.05	0.83	7.5 ± 5.13	<0.001 [†]
	No	3.49 ± 1.51		4.61 ± 1.09		4.54 ± 2.5	
Adequate information on clinical observation of physically disabled [‡]	Yes	4.82 ± 1.74	<0.001 [†]	4.68 ± 0.99	0.94	6.53 ± 2.98	<0.001 [†]
	No	3.37 ± 1.51		4.77 ± 1.02		4.35 ± 2.52	

[‡]statistically significant at p value <0.05.

[§] student t-test used.

[†] One way ANOVA test used.

[‡] different letters used to compare between groups using Post hoc test (tukey) test

Table (3): Multivariable Regression Analysis of the Different variables related to knowledge, attitudes and practices scores of dental postgraduate students towards physically disabled patients.

Variable (s)	Knowledge scores		Attitude scores		Practices scores	
	B (95% C.I.)	P Value	B (95% C.I.)	P Value	B (95% C.I.)	P Value
Age	-0.05 (-0.17, 0.07)	0.43	0.01 (-0.09, 0.10)	0.97	-0.12 (-0.24, 0.12)	0.30
Average years of practice	0.09 (-0.01, 0.19)	0.76	-0.00 (-0.08, 0.07)	0.97	0.20 (0.02, 0.38)	0.029*
Gender	Reference		Reference		Reference	
Males	0.15 (-0.24, 0.53)	0.45	0.16 (-0.12, 0.44)	0.26	0.11 (-0.57, 0.80)	0.75
Graduation year	Reference		Reference		Reference	
< 2010	-0.35 (-1.42, 0.73)	0.53	0.26 (-0.54, 1.05)	0.53	-0.63 (-2.57, 1.31)	0.52
2010 - 2015	-0.05 (-0.65, 0.55)	0.87	0.25 (-0.20, 0.69)	0.28	-0.24 (-1.33, 0.85)	0.66
> 2015	Reference		Reference		Reference	
Specialty	Reference		Reference		Reference	
Conservative dentistry & Prosthodontics	0.49 (-0.13, 1.11)	0.12	0.02 (-0.44, 0.49)	0.92	0.02 (-1.10, 1.15)	0.97
Pedodontics, dental public health & orthodontics	0.77 (0.10, 1.44)	0.024*	-0.21 (-0.70, 0.29)	0.42	1.04 (-0.17, 2.25)	0.09
Oral surgery	0.14 (-0.52, 0.81)	0.68	-0.03 (-0.52, 0.47)	0.92	0.59 (-0.61, 1.79)	0.34
Oral biology, oral pathology & dental materials	-0.66 (-1.64, 0.32)	0.19	-0.39 (-1.12, 0.33)	0.29	-0.60 (-2.37, 1.17)	0.51
Periodontology, Oral medicine & Radiology	Reference		Reference		Reference	
Previous academic theoretical information regarding SND	Reference		Reference		Reference	
No	-0.84 (-1.25, -0.43)	<0.000*	-0.04 (-0.35, 0.26)	0.79	-0.38 (-1.13, 0.36)	0.31
Yes	Reference		Reference		Reference	
Sufficient clinical training	Reference		Reference		Reference	
No	-1.35 (-1.87, -0.84)	<0.000*	-0.07 (-0.45, 0.32)	0.76	-2.00 (-2.93, -1.07)	<0.000*
Yes	Reference		Reference		Reference	
Adequate information on clinical observation of physically disabled	Reference		Reference		Reference	
No	-0.53 (-0.98, -0.82)	<0.000*	-0.24 (-0.57, 0.09)	0.16	-1.00 (-1.80, -0.19)	0.015*
Yes	Reference		Reference		Reference	

DISCUSSION

Alexandria Faculty of Dentistry is the setting responsible to deliver the standard oral health services for all population in Alexandria including those with special needs. Accordingly, it was necessary to detect the knowledge, attitudes and reported practices among postgraduate students regarding special care people (15).

The current study showed that dentists graduated from Alexandria University between the years 2010 to 2015 achieved the highest knowledge as well as reported practice levels. The current findings are not consistent with the study held in Sofia, Bulgaria, which revealed that 92% of dentists reported having minimal knowledge (16).

The pedodontics, dental public health and orthodontic specialties showed the highest mean knowledge and practice scores and differed significantly. This is consistent with what reported by the American Academy of Pediatric Dentistry (AAPD) that providing preventive and therapeutic oral health care to (SHCN) is an integral part of the specialty of pediatric dentistry (17).

The current study also revealed that the majority of the participants had received previous academic theoretical information related to SND. The present

findings are not in agreement with the Indian study which reported that only 14% of their participants had previous theoretical information about SND (2). Another Indian study reported that more the half didn't receive educational experiences with SND.

On the other hand, a Malaysian study (18) found that only one dentist of their study sample had training which is consistent with the present study showed that minority of the postgraduate dentists received sufficient clinical training.

A study conducted in Saudi Arabia (19) revealed that the majority of their sample had adequate information on the clinical observation of SND. On the other hand, less than half of the current study respondents did not receive adequate information in seminars on physically disabled patients represented. This was supported by a study conducted in Egypt showed that experience in the care for individuals with special needs is limited to post graduate students. Essentially, the courses regarding the care of individuals with special needs are rare and difficult to find (20).

The majority of the study sample reported that they do know that special needs include other types than mental; also confirmed that dealing with special needs patients includes those patients who are on medical treatments. These findings are consistent with those of a recent Canadian study and an Indian study that reported that more than half of the dentists claimed that the medically compromised patients are the most frequently treated special needs patients in dental clinic (21, 22).

Although the majority of the participants felt sorry for SNP, approximately half of them felt not comfortable when treating them. These findings were inconsistent with an Indian study which reported that up to 76% of dentists' felt comfortable treating people with special needs (23).

A study held to evaluate dentists in United States and Canadian dental schools which reported that 95% of these schools educated dentists about the utilization of such a technique when dealing with special needs patients (22) were not consistent with the current study findings which revealed that Less than half of the respondents did not use special techniques such as (Tell, Show, Do) when dealing with deaf or blind patients

Rajan et al, (21) study reported that only 27% of the dentists refer these patients to specialists is not consistent with the current study where the participants prefer referring special needs patients to a specialist.

Rajan et al study revealed that there was a statistically significant association among age, specialty, and willingness to treat CSHCN. Also, showed significance between the training obtained and the management technique used and these were consistent with the current study findings with respect to the influence of the various demographic characteristics of the study participants on the level of knowledge, attitude and reported practice towards special needs. Although, Rajan et all study revealed statistical significance between specialty of post graduation and behavior management technique, this were not consistent with current findings (21).

The present results clearly indicated that during the undergraduate education, students do not gain the necessary expertise to treat special needs patients. Therefore, further research is needed to determine the most effective instructional methods to ensure that the students are equipped with the necessary skills required for management of the broad range of developmental disabilities that they may encounter in their future practice. Moreover, there is a need for there is a need for further studied to be done in order to generalize the results and offer an effective strategy to improve knowledge, attitudes and practice experiences of postgraduate dentists.

LIMITATIONS

The study being based on cross-sectional survey, thus the causality of any association is not strongly proved. Difficulty in approaching dentists due to their overloaded work and different schedules. Some participants refused to answer the questionnaire due to tight schedules or lack of interest.

CONCLUSIONS

Although the postgraduate dentists at the Faculty of Dentistry, Alexandria, tend to have a fair overall knowledge level regarding special needs patients and those with physical disability and their management, attitudes and reported practices were considerably good.

The current study also revealed that there was lack of education program in clinical training for special need dentistry.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest

FUNDING STATEMENT

This research received no funding.

REFERENCES

1. AlSaadi RN, Albahrani SS, Alshodokhy ED, Alnaim AF, AlAbdullah SM, Alkharrboush FA, et al. Special Needs Dentistry: Perception, Attitudes and Educational Experience of Dental Students in Riyadh Colleges of Dentistry and Pharmacy, KSA. *DJDOH*. 2018;4:46-53.
2. Kapoor S, Chahar P, Mohanty V, Balappanavar AY. Special care dentistry: Knowledge and attitudes among Indian dental students. *J Indian Assoc Public Health Dent*.2019;17:108-13.
3. Daily News Egypt. 2.61% of Egyptians have disabilities in 2017: CAPMAS. 2018. Available at: <https://www.dailynewssegypt.com/2018/12/03/2-61-of-egyptians-have-disabilities-in-2017-capmas/>
4. Morsy AMA, Olik MMM. Effectiveness of Non-Governmental Organizations (NGOs) programs in the integration of multi-disability into the local community. *EJSW*. 2019;8:227-58.
5. Adyanthaya A, Sreelakshmi N, Ismail S, Raheema M. Barriers to dental care for children with special needs: General dentists' perception in Kerala, India. *J Indian Soc Pedod Prev Dent*.2017;35:216-22.
6. Wilson N. Special Care Dentistry - An Evolving Aspect of Dentistry. *Prim Dent J*.2015;4:4.
7. Waldman HB, Al-Nowaiser AM, Hamed MT, Perlman SP. Dentistry for individuals with special needs in

- Saudi Arabia: a commentary. *J Disabil Oral Health*. 2010;11:57-60.
8. Ahmad MS, Razak IA, Borromeo GL. Undergraduate education in special needs dentistry in Malaysian and Australian dental schools. *J Dent Educ*.2014;78:1154-61.
 9. Balasubramanian R. Education and training in special care dentistry-A review. *Med Res Chron*.2014;1:183-9.
 10. Alumran A, Almulhim L, Almolhim B, Bakodah S, Aldossary H, Alakrawi Z. Preparedness and willingness of dental care providers to treat patients with special needs. *Clin CosmetInvestig Dent*.2018;10:231-6.
 11. Faulks D, Freedman L, Thompson S, Sagheri D, Dougall A. The value of education in special care dentistry as a means of reducing inequalities in oral health. *Eur J Dent Educ*.2012;16:195-201.
 12. Yeaton S, Moorthy A, Rice J, Coghlan D, O'dwyer L, Green E, et al. Special care dentistry: how prepared are we? *Eur J Dent Educ*.2016;20:9-13.
 13. Pannucci CJ, Wilkins EG. Identifying and avoiding bias in research. *Plast Reconstr Surg* 2010;126:619-25.
 14. Valle-Jones R, Chandler D. Special care dentistry: two sides of a coin. *Br Dent J*.2015;218:313-4.
 15. Gericke A, Britain K, Elmahdawy M, Elsisi G. Health System in Egypt. In: Ginneken E, Busse R (eds). *Health care systems and polices, Health Services Research*. New York, NY: Springer; 2018.
 16. Doichinova L, Peneva M. Awareness of dentists about oral health of children with disabilities. *Journal of IMAB - Annual Proceeding (Scientific Papers)* 2014;20(5):661–663.
 17. American Academy of Pediatric Dentistry. Management of dental patients with special health care needs. *The Reference Manual of Pediatric Dentistry*. Chicago, Ill.: American Academy of Pediatric Dentistry; 2020:275-80.
 18. Bindal P, Chai WL, Bindal U, Safi SZ, Zainuddin Z, Lionel A. Dental Treatment and Special Needs Patients (SNPs): Dentist's Point of View in Selected Cities of Malaysia. *Biomed Res- India*. 2015;26:152-6.
 19. Shah AH, Fateel A, Al-Nakhli O. Dentists and Dental students opinion regarding dental treatment of patients with special needs. *JPDA*. 2011;20:98-104.
 20. Waldman HB, Al-Khatib S, Perlman SP. Dentistry for Egyptians with Special Needs. *J Oral Dent Health*. 2019;3:1-3.
 21. Rajan S, Kuriakose S, Varghese BJ, Asharaf F, Suprakasam S, Sreedevi A. Knowledge, Attitude, and Practices of Dental Practitioners in Thiruvananthapuram on Oral Health Care for Children with Special Needs. *Int J Clin Pediatr Dent*.2019;12:251-4.
 22. Meggan Kraus et al. Dental Education About Patients with Special Needs: A Survey of U.S. and Canadian Dental Schools. *J Dent Educ*. Volume 74, Number 11.
 23. Jodalli P, Siddique S, Dsouza N. Attitude of dentists towards providing oral health care to patients with special health care needs (PSHCN) in Mangalore, India. *Int J Oral Care Res*. 2015;3:1-7.