Evaluation of some Aspects of School Health Services in Babylon Province,2015

Zahraa Ali Abd Al-Hussain
Babylon Health Directorate
Hasan Alwan Baiee
Babylon Medical College
hassanbaey@yahoo.com

Abstract

Background:

"The children of today are the adults of tomorrow , thus, proper school health services are crucial for promoting the health of our school children and achieving the learning goals.

Objective:

To evaluate the performance of some primary health care centers regarding the implementation of some aspects of school health services.

Methodology:

A cross sectional study included six primary health care centers which were randomly selected, four from the center of Babylon province (urban) and two from the periphery (rural) . The other part of the study also involved six primary schools, each primary school is related to one of the above mentioned primary health care centres . All pupils of the first grade in schools have been screened . The period of study extended from the beginning of March through May, 2015 . A structured questionnaire was used to collect information :- demographic characteristics in addition to measurements of children's body mass index to assess the nutritional status , examination of errors of refraction and the assessment of speech disorders. Medical records of primary health care centers related to first grade primary school pupils were reviewed to verify the findings of medical staff in their medical records .

Results:

This study showed that there were significant differences $p < 0.05$ between the proportion of cases detected by this study which was high compared to the data reported by school health records in the primary health care centers .The number of assessed pupils in this study was statistically higher significantly than that found in school health records $p= 0.01$ .The prevalences of the following health. The health problems detected in the screening process were (3.6%) , (7.3%) , (12.4%) for refractive errors , speech disorders and obesity respectively .One physically handicapped child was identified in this study that was not reported in the school health team records.

Conclusions:

School health services provided to our elementary school children were neither complete nor adequate , the study recommended the need for urgent action to improve the school health services.

Keywords : school health , evaluation , primary schools children , errors of refraction , speech disorder, malnutrition.

الخلاصة

خلفية البحث :

ان نجاح العملية التعليمة مرتبط بالصحة الجيدة و العكس هو الصحيح. لذا فأن برامج الصحة المدرسية هي جزء من النظام الصحي الشامل في أي بلد في العالم.

الهدف :

لتقييم أداء بعض مراكز الرعاية الصحية الأولية بخصوص تنفيذ بعض الجوانب من خدمات الصحة المدرسية.

طريقة الدراسة :

دراسة مقطعية شملت ستة مراكز رعاية صحية أولية التي اختيرت عشوائياً ، أربعة منها في مركز محافظة بابل (الحضر)، واثنان في الاطراف (الريف) . الجزء الآخر من الدراسة أيضاً شملت ست مدارس ابتدائية، كل مدرسة ابتدائية مرتبطة بمركز الرعاية الصحية الأولية المشمول بالدراسة , جميع تلاميذ المرحلة الأولى في المدارس شاركوا بالدراسة . امتدت فترة الدراسة ابتداء من آذار/مارس إلى أيار/مايو، عام 2015. تم استخدام استبيان منظم لجمع المعلومات التالية:-الخصائص

الديمغرافية بالإضافة إلى قياسات مؤشر كتلة الجسم للاطفال لتقييم الحالة التغذوية ، فحص أخطاء الانكسار وتقييم اضطرابات الكلام. تم مراجعة السجلات الطبية لمراكز الرعاية الصحية الأولية المتعلقة بتلاميذ صف الأول الابتدائي للتحقق من النتائج التي توصل إليها العاملون الصحيون في سجلاتهم الطبية . وشمل استبيان فرق الصحة المدرسية وجود أو عدم وجود زيارات لفرق الصحة المدرسية إلى المدارس المختارة، ووجود أو غياب الأطباء المعينين لخدمات الصحة المدرسية .

النتائج

أظهرت هذه الدراسة أن هناك فرق معنوي واحصائي مهم $p < 0.05$ بين نسبة الحالات المرضية التي اكتشفت بواسطة هذه الدراسة و التي كانت عالية مقارنة بالبيانات الموثقة في سجلات الصحة المدرسية في مراكز الرعاية الصحية الأولية. وان عدد التلاميذ المفحوصين في الدراسة اعلى من المسجلين في سجلات فرق الصحة المدرسية وبفارق احصائي معنوي $p = 0.01$. ان معدلات انتشار العلل المرضية الاتية المكتشفة بواسطة الباحث اثناء عملية الفحص كانت كما يلي (3.6 ٪) ، (7.3%) ، (12.4%) للأخطاء الانكسارية , اضطرابات الكلام و السمنة على التوالي . وجدت حالة اعاقة جسمية واحدة في هذه الدراسة و هي غير مسجلة في سجلات فرق الصحة المدرسية .

الاستنتاج

خدمات الصحة المدرسية المقدمة الى اطفال مدارسنا الابتدائية تعاني النقص وقلة الجودة . أوصت الدراسة ضرورة اتخاذ اجراءات سريعة لتحسين واقع خدمات الصحة المدرسية.

الكلمات المفتاحية : الصحة المدرسية, التقييم, اطفال المدارس الابتدائية , الاخطاء الانكسارية, اضطراب الكلام, سوء التغذية.

Introduction

Good health supports successful learning. Successful learning supports health. Education and health are inseparable. Worldwide, as we promote health , we can see our significant investment in education yields the greatest benefits (Byrne, 2015).

School health program (SHP) is an important component of the overall health care delivery system of any country (Ademokun *et al.*, 2014).

School health services (SHS) constitute one of the components of the School health program and deal with the maintenance of the health of school children, effective school health services facilitate early diagnosis of diseases (Akani & Nkanginieme, 2007). School health services are health services that have a responsibility for child health care and education (Lee *et al.*, 2005)

A historical review reveals that the awareness of the need for a health service for school aged children started quite early and has spread all over the world, thus, most countries have initiated some form of school health program, and state of these programs, however, varies from country to country, depending on certain characteristics of each country (Toma *et al.*, 2014) .

Health system in Iraq has a specific and a clear guideline on school health , and its implementation in schools , however, most of these guidelines are not strictly followed and there was a poor follow up on the implementation of these guidelines ,which has been observed in other countries and was documented by the WHO (Al-Deen *et al.*, 2006) .

School is known to have an impact on children`s psychosocial development and mental health , It is important to provide an environment that is wholesome and supportive of learning (Al-Taee & Al-Tuhafee,2012) and necessary for a child's development (Behzadkolaee *et al.*, 2015).

Our country has been subjected to years of negligence , damage and deterioration, exacerbated by a series of wars leading to bad impact on school health services and on the education (Salih & Khalifa, 2013).

This study was conducted to evaluate the performance of school health services in primary health care centers regarding the implementation of some

aspects of school health (refractive errors, speech disorders and malnutrition) and to identify the discrepancy between the findings of this screening and the actual situation.

Methodology

This is a descriptive cross sectional comparative study which was carried out in, Babylon province . Six primary health care centers (PHCCs) were included and selected by simple random technique, four from the urban region (Al–kathia, Babyl Al–tadreby, Hay Al-imam, Al- Zahraa) and two from the rural areas (Al-Baker , Al-Sadek), the study also involved six primary schools, each primary school linked to PHCC, the schools enrolled were the following:- (Al-Adnanya, Al-tatbikat, Al-Hilla , Al-Saida Zainab, Haider Al-Hilly, Abi–Tamam).

The pupils included in this screening were only the first grade primary school pupils aged about 6 years. All pupils of first grade of the studied schools have been examined single handy by the researcher himself .

Fisher's formula was used for sample size determination as recommended (Chadha,2006) .

The total sample size required according to the equation will be 384 pupils. The total number of pupils eligible for the study in the six selected schools was 589 pupils which are close to the required sample size .

A structured questionnaire was prepared by the researcher to gather , the required data by interviewing the pupils and PHCCs teams .

All children were given a written consent form to be approved and signed by their parents

Questionnaire for PHCCs staff was used which included the presence or absence of visiting PHCCs team to the chosen schools and the presence or absence of appointed doctor for school health services .

Instruments used to collect data were: questionnaire , weight and height scales , growth charts of BMI for age for girls and boys , screening test of speech sound disorders and stuttering, Snellen's chart (Grover *et al.*, 2012).

The vision of the right eye was tested first followed by the left and the results immediately noted by the researcher himself (Gupta *et al.*, 2012) .

According to the WHO category of the visual acuities are:(Raga *et al.*, 2014) .

Visual acuity	WHO category
- 6/6 – 6/18	Normal vision.
< 6/18 – 6/60	Visual impairment.
< 6/60 –3/60	Sever visual impairment.
< 3/60	Blind.
Undeterminable	-

The presence or absence of speech sound disorders, in this study was detected by using a simple modified screening test produced by (Abdul *et al.*,,2008). This test aims to diagnose speech disorders in children in the Arabic environment ,where standardized measures for efficient pronunciation in the Arabic environment is not available, author benefited from some foreign standards such as test

of pronunciation for each of [Goldman M.] and Arizona test to measure the skill of pronunciation by [Fudala].

The researcher used a stuttering screening test adopted by (Yarrus,1998) translated by (Muna, 2008) .The messages were sent to school teachers ,families of affected pupils and to PHCC for follow up regarding psychological support and possible proper management.

The height was measured in centimeters to the pupils without shoes using height board with a horizontal head board that contacts the upper most point in the head.

Weight was measured in kilograms with electronic weight scale (QE– 2003,China) with an accepted error of 0.1 kg.

Body mass index (BMI= Quetelet's index) was estimated from the following equation:

BMI= Weight (kilogram) / height (meter^2) .(Stankovic *et al.*,2013).

The BMI for age growth charts for either girls or boys were obtained a percentile ranking for each gender (AL-Qasab SJ,2013).

BMI-for-age categories and corresponding percentiles are:(Dietz W *et al.*, 2009a).

Weight Status	**Percentile Ranking**
Underweight	Less than 5th percentile
Healthy weight	5th percentile to less than 85th percentile
Overweight	85th percentile to less than 95th percentile
Obese	Equal to or greater than the 95th percentile

Physical handicap assessment , only by observation of the general appearance and gait were used to detect any obvious physical handicap

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 17 , a descriptive and inferential statistical analyses using percentages and frequency tables and Pearson Chi-square test (χ^2) ,fisher's exact test were used with p values of less than 0.05 were considered statistically significant .

Results

Table 1 shows the distribution of school health services and results of examination carried out by the researcher as compared with the medical records of primary health care centers according to location of PHCC (urban / rural), there were two PHCCs ,out of the six PHCCs have appointed doctor for school health services (33.3%). During the study period a total of 589 pupils (boys and girls) were examined by the researcher while only 505 pupils (boys and girls) were found in medical records of the 6 PHCCs examined by health school teams, this means that 84 pupils (14.2%) were missed ,these differences were statistically significant ($\mathcal{X}^2$ =6.450 , df =1 , p value = 0.011) .

Table 1 : Distribution of first grade pupils according to the examination status and some sources of school health services provision.

	(4) PHCCs * / urban				No.	(%)	(2)PHCCs * / Rural		No.	(%)	Total No.	(%)
PHCCs *	Al-Kathia	Babyl Al-tadreby	Hay Al-imam	Al-Zahraa	4	(67)	Al-Baker	Al-Sadek	2	(33)	6	(100)
Name of primary school	Al-Adnania	Al-Atatbikat	Al-Hilla	Al- Saida Zainab	4	(67)	Haider Al-Hilly	Abi-Tamam	2	(33)	6	(100)
No. of pupils in participating school - Researcher examination - PHCCs*records	106 113	95 91	130 106	94 61	425 371	(72.2) (73.5)	50 39	114 95	164 134	(27.8) (26.5)	** 589 505	** Difference 84(14.2)
Visiting PHCC* team to school	1	1	1	1	4		1	1	2		6	(100)
Appointed doctor for school health	1	0	1	0	2		0	0	0		2	(33.3)

* PHCCs : Primary health care centers .

** The difference between the finding and what was recorded =84(14.2%) χ^2 = 6.450 , df =1 , p value = 0.011

Table 2 shows the distribution of cases according to the type of defects detected by the researcher and school health teams by the location of PHCCs and the status of management for each defects (referral to the secondary health care services). There is one case with physical handicap that detected by the researcher himself but not detected and documented by the school health team .

Table 2: Distribution of cases according to the type of defects detected by the researcher and school health teams by the location of PHCCs.

Characteristics	(4) PHCCs * urban		(2) PHCCs* rural		Total	
	No.	(%)	No.	(%)	No.	(%)
No. of pupils						
Researcher examination	425	(72.2)	164	(27.8)	589	(100)
In PHCCs* records	371	(73.5)	134	(26.5)	505	(100)
Refractive errors						
Researcher examination	20	(95.2)	1	(4.8)	21	(100)
Management(referral)	2 referral	(10)	0	(0)	2	
In PHCCs* records	2	(100)	0	(0)	2	(100)
Speech disorders						
Researcher examination	26					
	0	(60.5)	17	(39.5)	43	(100)
Management	1	(0)	0	(0)	0	(0)
In PHCCs* records		(33.3)	2	(66.6)	3	(100)
BMI for age(85th-<95thPer.)#						
Researcher examination	89	(87.3)	13	(12.7)	102	(100)
In PHCCs * records	28	(93.3)	2	(6.7)	30	(100)
BMI for age(≥95thPer.)##						
Researcher examination	66	(90.4)	7	(9.6)	73	(100)
Management(referral)	0	(0)	0	(0)	0	(0)
In PHCCs* records	11	(84.6)	2	(15.4)	13	(100)
BMI for age (<5th Per.)$				(50)		
Researcher examination	4	(50)	4	(0)	8	(100)
Management(referral)	0	(0)	0	(25)	0	(0)
In PHCCs* records	36	(75)	12		48	(100)
Physical handicap	1					
Researcher examination	0	(100)	0	(0)	1	(100)
Management	0	(0)	0	(0)	0	(0)
In PHCCs* records		(0)	0	(0)	0	(0)

*** PHCCs: Primary health care centers (school health teams).**
 # BMI for age(85th-<95th Percentile) consider overweight.
BMI for age(≥95thPercntile) consider obesity.
$ BMI for age (<5th Percentile) consider underweight.

Table 3 shows the distribution of refractive errors recorded by PHCCs teams versus findings detected by the researcher , there were 21 children (3.6%) with morbid refractive errors (visual impairment), identified by the researcher but only two of children (0.4%) were recorded in the school health teams records ,this difference was statistically significant (p value = 0.000) .

Table 3 : Distribution of refractive errors recorded by PHCCs teams versus findings detected by the researcher.

	Prevalence of pupils with refractive errors		**Pupils without refractive errors**		**Total**		x^2	*df*	*P* value
	No.	**(%)**	**No.**	**(%)**	**No.**	**(%)**			
Researcher examination	21	(3.6)	568	(96.4)	589	(100)	13.269	1	0.000
PHCCs* teams examination	2	(0.4)	503	(99.6)	505	(100)			

* PHCCs : Primary health care centers (school health teams) .

Table 4 shows the distribution of speech disorders recorded by school health teams versus findings detected by the researcher himself, there were 43 children (7.3%) with speech disorders identified by the researcher and the findings of school health teams were only 3 children (0.6%) , this difference was statistically significant (p value = 0.000).

Table 4 : Distribution of speech disorders recorded by PHCCs teams versus findings detected by the researcher .

	Prevalence of Pupils with speech disorders		Pupils without speech disorders		Total		x^2	*df*	*P* Value
	No.	(%)	No.	(%)	No.	(%)			
Researcher examination	43	(7.3)	546	(92.7)	589	(100)	30.359	1	0.000
School health teams examination	3	(0.6)	502	(99.4)	505	(100)			

Table 5 shows frequency distribution of nutritional status recorded by PHCCs teams versus findings detected by the researcher .There were 73 children (12.4%) with obesity , the findings of PHCCs teams were 13 obese children (2.6%) ,102 children (17.3%) were overweight according to researcher examination ,but the findings of health teams were 30 children which constituted (5.9%) , while 8 children (1.4 %) were underweight according to researcher findings , but the findings in medical records were 48 children (9.5%) ,this difference was statistically significant (p value = 0.000) .

Table 5 : Frequency distribution of nutritional status recorded by PHCCs teams versus findings detected by the researcher .

	pupils with obesity		pupils with overweight		pupils with underweight		pupils with normal weight		Total		χ^2	*df*	*P* value
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)			
Researcher examination	73	(12.4)	102	(17.3)	8	(1.4)	406	(68.9)	589	(100)	103.94	3	0.000
PHCCs* teams examination	13	(2.6)	30	(5.9)	48	(9.5)	414	(82.0)	505	(100)			

*PHCCs : Primary health care centers (school health teams).

Disccussion

The current study showed that 84 (14.2%) children out of 589 were not examined by the school health teams of primary health care centers , this means that about one out of seven of school children was not exposed to any medical examination at the time of school entry . This relatively high proportion of un examined school children is not acceptable and it is well known that examination of children during entry to school is very essential and can be used as a baseline for monitoring the school children health in the future (Absaheb & Dharma, 2014). This indicator reflects a significant shortcoming in the work of school health services teams in our country , this finding agreed with the finding of another study carried out in Baghdad province (Al-Deen *et al*., 2006) .

Two third of our school children have no chance to be seen by a professional physicians and this may be explained by the fact that Iraqi health system is facing a shortage of medical doctors (Al-Sadi, 2014; Al-Hasnawi ,2013). This finding may reflect a weakness in legislative and administrative levels at the level of Ministry of Health. Incentive (Sempowski, 2004; Pathman *et al.,* 2000) protection and improving work condition may attract physicians to work in underserved areas (Walker *et al.,* 2010; Mareck, 2011).

The school health committee of the American Academy of Pediatrics stressed the need for the involvement of pediatricians as major stakeholders in child health, in the school health programme (American Academy of Pediatrics,2000).

School health services are a neglected aspect in the Health and Education Sectors of our country , this may be due to different reasons such as economic downturn and political instability in the country (Cetorelli & Shabila, 2014).

Out of 21 children detected during the screening process by researcher in this study had morbid errors of refraction ,only 2 of them were reported by the school health teams . This study reveals that 3.6% out of the total screened pupils in this work had refractive errors while the studies by (Al-Deen *et al.,* 2006) and Muma et al in Kenya (Muma MK *et a.,* 2009) reported that the prevalence of refractive errors among elementary school children was (2% and 5.2% respectively) ,the differences in the prevalence of different studies may be related to genetic factors , or the differences reflected to the study designs .

Early detection of children with errors of refraction gives chance to the child to correct his vision and help to improve the students learning capacity (Murthy *et al.,* 2000).

Regarding the speech disorders , this study identified many pupils who actually suffering from speech disorders , this high rate reflected the poor detection activity or the under reporting of speech disorders among our school children which may be related to the lack of experience and skills of our school health care providers or may be due to negligence of this problem which has serious consequences and bad psychosocial impact on our children. This finding coincides with the findings of other study (Al-Deen *et al*., 2006). In the current study among (589) 1st class elementary school children screened , the results demonstrated that 7.3% of those pupils were suffering from speech disorders , a local study in Baghdad (Al-Deen *et al.,* 2006) reported the prevalence of speech disorders among primary school children as 1.1%, while 14.8% of school children with speech disorders reported by Karbasi et al in Yazd-Iran (Karbasi *et al.,* 2011). The rate of this study is very close to the rate reported by a large-scale United Kingdom study 5.6 % of all children at eight years of age (Wren *et al.,* 2013). A similar finding was made for seven year olds of primary school children in Australia (Kyriaki**,** 2011) . This wide gap between rates of speech disorders might be due to the difference in the age groups and source of collection of data based on report of employed teachers and parents (Cortiella & Horowitz , 2014).

The screening results of this study revealed that the overall prevalence of obesity among the studied pupils was 12.4 % which was much higher than that reported by school health teams which was 2.6 % of school children.

The present study revealed that out of the total screened pupils 17.3% had overweight which was higher than that reported by school health teams which was 5.9% of primary school children.

In Basrah previous studies suggested that the prevalence of childhood overweight and obesity has markedly increased (Ebrahim, 2005). The prevalence of overweight and obesity in the present study was similar to or higher than that of a study carried out in Basrah city during the year 2013 (Ajeel & Salman, 2013)**.**

Conclusion

The discrepancy between what was reported in the school health records and the actual situation is unfortunately high enough to reflect the low quality of our school health services.

Aknwoledgements

Thanks are due to all participants , parents , teachers and to health care providers who actively cooperated with us during conducting this work.

References

Abdul RS, Ashraf AH, Ehab B. Evaluation and diagnosis in special education . 2008; 395-396.

Absaheb SP, Dharma SS. Importance of school health programmes in schools.International Multidisciplinary e-Journal. 2014;3. www.shreeprakashan.com

Ademokun OM, Osungbade KO, Obembe TA . A qualitative study on status of implementation of school health programme in South Western Nigeria: Implications for healthy living of school age children in developing countries. American Journal of Educational Research.2014;2(11): 1076-1087.

Ajeel NAH , Salman MA . Prevalence of overweight and obesity among public primary school children in Basrah city. Iraqi J. Comm. Med. 2013 ;26(2):103-108.

Akani NA , Nkanginieme KE. The school health programme. In: Azubuike JC, Nkanginieme KE, editors. Paediatrics and child health in a tropical region. 2nd ed. Owerri : African Educational Services. 2007; 47-55.

Al-Deen LD, Al-Bayatti NMF, Al-Delami AK . Evaluation of some aspects of school health service in Baghdad –Al-KarKh district. Iraqi J. Comm. Med. 2006;19 (1):8-14.

Al-Hasnawi S .Physicians' shortage in Iraq: Impact and proposed solutions .Iraqi J. Comm.Med.2013;26(3):214-218.

AL-Qasab SJ, Gingival health and alveolar bone loss among Iraqi overweight primary school - age pupils (Radiographic study). Tikrit Journal for Dental Sciences .2013;(1):101-106.

Al- Sadi AHM . Analysis of some indicators in human development in Iraq and Syria.2014;22(6):1387-1403.

Al-Taee WGA, Al-Tuhafee RAA . Assessment of physical environment of primary schools in Mosul city. Ann. Coll. Med. Mosul. 2012; 38 (1): 54-58.

American Academy of Pediatrics, Committee on school health. School Health Assessments Pediatrics.2000;105:875-7.

Behzadkolaee SMA, Mirmohammadi ST, Yazdani J, Gorji AMH, Toosi A, Rokni M, Gorji MAH. Health , safety and environment conditions in primary schools of Northern Iran. Journal of Natural Science, Biology and Medicine.2015;6(1):76-79.

Byrne DO .Health promotion, non communicable disease prevention and surveillance.WHO,2015.

Cetorelli V, Shabila NP . Expansion of health facilities in Iraq a decade after the US-led invasion, 2003–2012. Conflict and Health . 2014; 8:16.

Chadha VK. Sample size determination in health studies. NTI Bulletin . 2006; 42(3&4):55–62.

Cortiella C, Horowitz SH. The state of learning disabilities: facts, trends and emerging issues, 3rd ed. New York: National Center for Learning Disabilities, 2014.

Dietz W, Story M, Leviton L . Introduction to issues and implications of screening, surveillance, and reporting of children's BMI. Pediatrics. 2009a; 124(Supplement1): S1-S2.

Ebrahim SM . Health status of primary school children in Basrah: The impact of school health services. A Ph.D thesis , University of Basrah ,2005.

Grover AK , Arora S. Eye screening in children : Its relevance and implications. JIMSA . 2012 ; 25 (4):221-222.

Gupta A , Lal R, Mazta SR, Sharma D. Prevalence of refractive errors, color vision defects and other ocular disorders in school-going children: Primary screening by school teachers.JIMSA.2012;25(4):223-224.

Karbasi SA , Fallah R , Golestan M . The prevalence of speech disorder in primary school students in Yazd-Iran. Acta Medica Iranica . 2011; 49(1): 33-37.

Kyriaki TE. Early identification, prediction, and classification of speech sound disorders in the preschool years. PhD thesis, Department of Pediatrics, The University of Melbourne ,2011. http://hdl.handle.net/11343/37011.

Lee A, Cheng FFK, Leger LST.Evaluating health-promoting schools in Hong Kong: development of a framework. Health Promotion International. 2005; 20(2): 177-186.

Mareck DG. Federal and state initiatives to recruit physicians to rural areas . American Medical Association Journal of Ethics .2011;13(5):304-309.

Muma MK , Kimani K , Kariuki – Wanyoike MM , Ilako DR , Njuguna MW . Prevalence of refractive errors among primary school pupils in Kilungu Division of Makueni District, Kenya. Medical Journal of Zambia . 2009;36(4):165-170.

Muna TA . Stuttering: Concept – symptoms- causes –prevalence – interpretation – effects.2008;306-310.

Murthy GVS . Vision testing for refractive errors in schools "screening" programmes in schools. Community Eye Health . 2000;13(33):9-10.

Pathman DE, Taylor DH Jr, Konrad TR, King TS ,et al. State scholarship, loan forgiveness, and related programs: the unheralded safety net. JAMA. 2000 ;284(16):2084-2092.

Raga AA, Salem AEPS, Saleh S, Basaleh PhD, Sawsan F, Mohammed MD . Ocular abnormalities among deaf students in Aden city, Yemen. Iraqi J Med Sci. 2014;12(3):209-215.

Salih HS, Khalifa MF . Evaluation of public and private schools physical environment standardized features in Kirkuk city .Mosul Nursing Journal. 2013;1(1):1-8.

Sempowski IP. Effectiveness of financial incentives in exchange for rural and underserviced area return-of-service commitments: Systematic review of the literature. Can J Rural Med.2004;9:82-88.

Stankovic V , Stojanovic ,Vasiljevic N .Evaluation of anthropometric indices for metabolic syndrome and their association with metabolic risk factors among healthy individuals in New Belgrade. Scientific Journal of the Faculty of Medicine in Nis .2013; 30(1) :21-30.

Toma BO, Oyebode T, Toma GIO, Agaba E . School health services in primary schools in Jos, Nigeria. Open Science Journal of Clinical Medicine. 2014; 2(3): 83-88. **Walker KO** , Ryan G , Ramey R , Nunez FL , Beltran R, Splawn RG, Brown AF. Recruiting and retaining primary care physicians in urban underserved communities: The importance of having a mission to serve. American Journal of Public Health. 2010 ;100(11) :2168 -2175.

Wren Y, McLeod S, White P, Miller L, Roulstone S. Speech characteristics of 8-year-old children: findings from a prospective population study. J Commun Disord. 2013;46:53-69.

Yaruss JS . Real –Time analysis of speech fluency: procedures and reliability training . AJSLP .1998;7:25-37.