

Family Adherence to Their Child's Health Issue Follow-Up and Its Associated Factors: A Cross-Sectional Study

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Keywords

Adherence · Follow-up · Health services · Referral · Screening

Abstract

Introduction: This study aimed to measure the adherence rate among families of referred cases from school health screening clinics to diagnostic clinics and to examine the associated factors. **Materials and Methods:** A cross-sectional study was conducted among families of cases referred from school health screening clinics to diagnostic clinics in Saudi Arabia. Data collectors contacted the guardians of the cases to fill out the interview questionnaire regarding their visit to the school health clinic and adherence to referral. **Results:** Among 698 families who participated in the study, 57.6% reported adherence to diagnostic clinics. Families of dental caries and myopia cases were more likely to adhere than families of obesity cases (aOR: 8.36 and 5.41, $p < 0.001$). The chance of adherence was about two-fold among families of cases referred to hospitals and specialized clinics compared to families of cases referred to primary healthcare centers (PHCCs) (aOR: 1.80, $p = 0.042$). **Conclusion:** This study revealed a low family

adherence rate among cases referred to diagnostic clinics. Additionally, the study documented that referral to PHCCs and screening positive for obesity were the main factors associated with non-adherence. Taking care of children's health is one of their rights, and increasing the family's adherence by raising families' awareness and designing a referral reminder system are recommended. In addition, the services of PHCCs should be strengthened.

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Introduction

Screening programs aim to detect health problems and prevent their aggravation and negative impact on society. Subsequently, the screening physician refers the detected health problems to more specialized clinic for further assessment and management [1]. While referral is the link between primary and specialty care, adherence to the referral system is an essential indicator of its effectiveness [2, 3]. Likewise, referrals from primary healthcare rely on the adherence of referred patients and not merely on the physician's judgment [4].

Several studies have reported barriers to adherence to referral. These barriers included physical, economic, and attitudinal factors. Physical and economic reasons included the distance to the referred healthcare facility, method of referral (such as giving a referral slip), availability of transportation, and social status of families [5–8]. Attitudinal reasons included misconceptions regarding detected health issues or mistrust in healthcare facilities based on previous experience [5, 9].

In Saudi Arabia, the Ministry of Health (MOH) has established a school-based screening program to detect various health problems among students. However, during the lockdown of schools and virtual learning during the COVID-19 pandemic, screening program was delivered through screening clinics in primary healthcare centers (PHCCs). The screening team, including a trained physician, dentist, and nurse, conducts screening among students for different health problems every 3 years, during the first and fourth primary, first intermediate, and first secondary grades. The team refers the detected cases to diagnostic clinics to confirm the diagnosis and receive adequate management. The type of referral healthcare facility depends on the cases, capabilities, and organization of each health region. The team could refer cases to clinics in PHCCs, while referring other cases to hospitals and specialized clinics [1]. The literature has emphasized the need for tools and methods to examine the impact of screenings, how to manage and transfer cases in the healthcare system, and to understand the factors contributing to adherence due to its dependence on several parties and different reasons [4, 10]. Therefore, this study aimed to measure the adherence rate among families of referred cases from school health screening clinics to diagnostic clinics during 2020–2021 in Saudi Arabia and to examine the associated factors.

Methods

Design and Participants

A cross-sectional study was conducted from December 2020 to June 2021 throughout the health regions of Saudi Arabia. The study included families of students with different health problems detected through school health screening clinics in PHCCs, namely, obesity, myopia, and dental caries, who were referred for follow-ups. Families of students without health problems and those who had been previously diagnosed were excluded from the study.

Sample Size and Sampling Technique

We assumed an adherence rate of 50% with an alpha level of 0.05, and power of 80%, taking into account a design effect of 1.5 to adjust for cluster sampling, yielding a minimum sample size of 576.

A cluster-sampling technique was used in this study. The chosen sample was proportional to all 22 health regions according to the number of referred cases from school health clinics, as obtained from the school health records. Systematic sampling was used to select the participants within each cluster. The data collectors contacted the guardians of the cases to fill out the interview questionnaire. The data collectors contacted each participant up to three times on different days and times to complete the calls. After failing to respond to the third attempt, we selected the following case from the record as an alternative for inclusion in the sample.

Instrumentation and Procedures

Well-trained data collectors contacted the guardians of the selected cases by phone to fill out a questionnaire at least 1 month after visiting the school health clinic. The questionnaire included a sociodemographic section containing the case's age, grade, nationality, parents' age, parental educational attainment, parental occupation, parents' marital status, family income, number of dependent children (children living in the same house and under the guardian's responsibility), healthcare eligibility, and transportation availability. The second section focused on the screening visit, which included the guardian accompanying the student to the school health clinic, detected health problems (e.g., obesity, myopia, and dental caries), receiving health education regarding the detected health problem, and overall satisfaction with the school health clinic. The last section was related to the referral method (e.g., verbal, short message service [SMS], or referral slip), type of referral healthcare facility (PHCC or hospital and specialized clinic), waiting days between the school health clinic visit and referral appointment, timing of referral appointment, driving distance from home to the referral health clinic, and adherence to referral.

The dependent variable “family's adherence to the diagnostic clinic”: self-reported adherence as the family was considered adhered when the student's guardian declared that his/her child had been seen and/or received any management (medical, surgical, physical, or educational) for the detected health problem, whether it was the same clinic referred to or another clinic. Figure 1 shows the pathways of the cases from the school health clinic.

Data Analysis

Data entry and analysis were executed using the Software Package for Social Science (SPSS) version 22. Descriptive data were reported as frequencies and percentages when they were categorical, while the investigators described continuous data as medians and interquartile ranges due to the non-normality of the data. Logistic regression was performed to predict significant risk factors influencing adherence to referral to a diagnostic clinic. The results were considered statistically significant at $p < 0.05$, with a 95% confidence interval.

Results

The response rate was 84.5%. The overall family adherence rate for the 698 cases included in the study was 57.6%. However, adherence rates differed for each health problem, being highest for dental caries (64%), followed

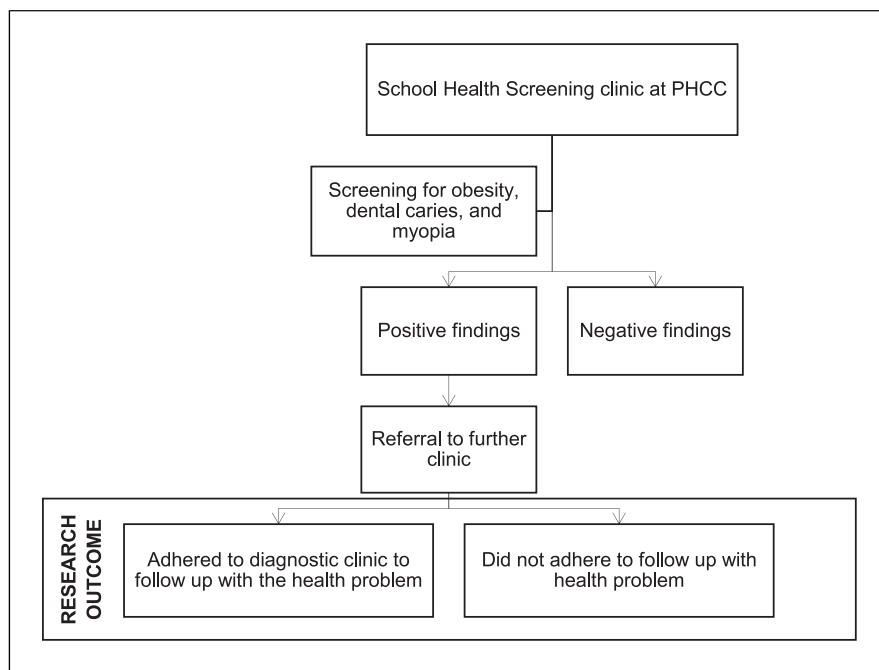


Fig. 1. Pathway of referred cases from school health clinic. When student was positive during school health screening, he/she was referred to a clinic for diagnosis confirmation and receiving management.

by myopia (63.1%) and obesity (34.7%). Table 1 presents the sociodemographic characteristics of the adherent and non-adherent groups. The significant differences in characteristics between the adherent and non-adherent groups were student age ($p = 0.000$), grade ($p = 0.000$), mother's age ($p = 0.000$), father's age ($p = 0.006$), and the number of dependent children ($p = 0.017$). Other characteristics, including sex, nationality, fathers' and mothers' education levels, and eligibility for healthcare, were not significantly different between the two groups.

Table 2 describes the characteristics of school health clinic visits and referral clinics. In most families that adhered to the diagnostic clinic, their children were accompanied by at least one parent during school health clinic visits (91.5%), received health education regarding their health problems (75.4%), and were satisfied with school health clinic visits (84.8%). The recorded significant variables affecting the family's adherence were the type of detected health problem ($p = 0.000$), guardian accompanying the child to the school health clinic ($p = 0.011$), method and timing of referral appointment ($p = 0.005$ and 0.000 , respectively), and driving distance from home to the referral clinic ($p = 0.000$).

Multivariate analysis revealed that the only significant variables were the type of detected health problem and the type of referral healthcare facility. Families of cases who had dental caries or myopia when screened were more likely to adhere to and follow up with their

child's health problems than those whose children had obesity (aOR = 8.36, 4.34–16.10, and aOR = 5.41, 2.64–11.08, respectively). Additionally, families of cases referred to hospitals and specialized clinics were nearly two times more likely to adhere and follow up with their child's health problem compared to families with their child referred to PHCCs (OR = 1.80, 1.02–3.17). Other variables were not significantly associated with adherence in multivariate logistic regression analysis (Table 3).

Discussion

School health screening in Saudi Arabia aims to detect various health problems among students, including obesity, dental caries, and myopia. Subsequently, the detected cases were referred for further assessment. Although referral is essential, adherence to referral to confirm the diagnosis and establish a management plan is needed to complete the journey. In the USA, the role of school nurses includes screening students, referring to detected cases, and follow up with them [11]. Moreover, the existence of school nurses is an effective method to ensure that students follow up on their health problems [12]. School nurses can arrange with students and families and refer them to suitable healthcare professionals [13]. This study was conducted to measure the

Table 1. Sociodemographic characteristics of adherent and non-adherent groups

Sociodemographic characteristics	Adherent (<i>n</i> = 402) (57.6%)	Non-adherent (<i>n</i> = 296) (42.4%)	<i>p</i> value
Age (<i>n</i> = 696): median, IQR, years	10.0 (9.0–13.0)	12.0 (9.0–15.0)	0.000*
Grade (<i>n</i> = 696)			0.000 ^a
Primary: 1st	97 (24.2)	39 (13.2)	
Primary: 4th	113 (28.2)	77 (26.1)	
Intermediate: 1st	119 (29.7)	100 (33.9)	
Secondary: 1st	72 (17.9)	79 (26.8)	
Nationality (<i>n</i> = 696)			0.434 ^a
Saudi	378 (94.3)	282 (95.6)	
Non-Saudi	23 (5.7)	13 (4.4)	
Sex (<i>n</i> = 696)			0.600 ^a
Male	145 (36.2)	101 (34.2)	
Female	256 (63.8)	194 (65.8)	
Mother's age (<i>n</i> = 673): median, IQR	38.0 (34.0–43.0)	40.0 (37.0–44.0)	0.000*
Mother's educational level (<i>n</i> = 662)			0.928 ^a
Primary school or lower	43 (11.1)	28 (10.2)	
Intermediate or secondary school	158 (40.7)	111 (40.5)	
Diploma, university, or higher education	187 (48.2)	135 (49.3)	
Mother's occupation (<i>n</i> = 667)			0.288 ^a
Working	107 (27.5)	87 (31.3)	
Housewife	282 (72.5)	191 (68.7)	
Father's age (<i>n</i> = 670): median, IQR	43 (39–50)	45 (41–51)	0.006*
Father's educational level (<i>n</i> = 662)			0.299 ^a
Primary school or lower	31 (8.0)	22 (8.0)	
Intermediate or secondary school	139 (35.8)	114 (41.6)	
Diploma, university, or higher education	218 (56.2)	138 (50.4)	
Father's occupation (<i>n</i> = 668)			0.049 ^a
Employed	310 (79.5)	203 (73.0)	
Unemployed	29 (7.4)	19 (6.8)	
Retired	51 (13.1)	56 (20.2)	
Marital status of the parents (<i>n</i> = 667)			0.274 ^a
Married	367 (93.9)	259 (90.6)	
Divorced	18 (4.6)	20 (7.0)	
One or both of them is deceased	6 (1.5)	7 (2.4)	
Dependent children (<i>n</i> = 680)			0.017 ^a
1–3 children	153 (38.5)	84 (29.7)	
≥4 children	244 (61.5)	199 (70.3)	
Family monthly income (<i>n</i> = 649)			0.499 ^a
<5,000 SR	87 (22.3)	54 (20.9)	
5,000–9,999 SR	144 (36.8)	83 (32.2)	
10,000 to less than 19,999 SR	119 (30.4)	90 (34.9)	
≥20,000 SR	41 (10.5)	31 (12.0)	
Healthcare access eligibility (<i>n</i> = 694)			0.266 ^a
Insurance	58 (14.5)	51 (17.4)	
Out of pocket to the private sector	62 (15.5)	52 (17.8)	
Eligible to other government healthcare facilities ^b	31 (7.7)	29 (9.9)	
Only MOH healthcare facilities	250 (62.3)	161 (54.9)	

Table 1 (continued)

Sociodemographic characteristics	Adherent (<i>n</i> = 402) (57.6%)	Non-adherent (<i>n</i> = 296) (42.4%)	<i>p</i> value
Transportation availability (<i>n</i> = 664)			
Yes	379 (96.7)	262 (96.3)	0.803 ^a
No	13 (3.3)	10 (3.7)	

IQR, interquartile range; MOH, Ministry of Health; SR, Saudi Riyal. *Mann-Whitney U test. ^a χ^2 test. ^bIncludes national guard, military, or university facilities.

adherence rate among families of referred cases from school health clinics to diagnostic clinics and to evaluate the associated factors.

The overall adherence rate to the diagnostic clinics among the studied samples was 57.6%. Studies addressing adherence to school health screening referrals in general have not been identified in the literature review. However, different studies have reported adherence rate to referral for single health problem. Considering obesity, the family adherence rate in the current study was slightly higher (34.7%) than that reported by Tatum et al. [14] (2021). The pooled estimate of parental responses to school-based body mass index screening programs ranged from 16% to 34%. However, Halvorson et al. [15] (2011) reported that the first-appointment adherence rate was higher (43.3%) when physicians referred children to a pediatric weight management clinic. The variation in the adherence rate compared to our study could be due to different sample characteristics as the aforementioned study was conducted among families of children aged 2–18 years with obesity and one or more comorbidities in the USA [15].

In addition, the adherence rate of families of myopia cases to the diagnostic clinics in our sample (63.1%) was within the range of previous studies (25.1–70.0%), which were among families of students in South Africa, the USA, and Norway [12, 16–18]. Meanwhile, when screened before school entry, 78.3% of the families of students who failed during visual acuity screening adhered to the diagnostic clinic [19]. Nevertheless, the current study's sample did not include students screened before entering school.

In the present study, the adherence rate among families of dental caries cases was 64.0%, which was much higher than the reported adherence rate of 36.1% in a systematic review of school dental screening programs for oral health [20]. In contrast, a lower figure (52.5%) was documented in a study conducted among primary school students in Riyadh, Saudi Arabia [21]. This difference could be attributed to the efforts of the MOH's oral health initiative to promote school students' oral health and encourage follow-up. Additionally, a wider geographical area was included in this study.

Comparing adherence rates among different screened health problems in our study, the odds of adherence among families of dental caries and myopia cases were significantly higher when compared to families of obese cases, which might be explained by the chronicity and longer duration needed to manage obesity [14]. In addition to the necessity of further efforts from the student and family to change the lifestyle, the management of myopia and dental caries depends mostly on healthcare provider management [14].

Concerning referral characteristics, the present study revealed that the chance of adherence among families whose children were referred to hospitals or specialized clinics was approximately two-fold compared to those referred to PHCCs. This was in line with a previous study in South Africa as adherence to referrals for non-acute child health conditions was higher in hospitals than in PHCCs (56.6% vs. 54.5) [3]. This could be explained by the increased satisfaction of families with services provided in hospitals than in PHCCs, given the diverse and specialized care offered in hospitals. Furthermore, adherence was higher among cases of dental caries and myopia in our study, which were mostly referred to specialized clinics and hospitals, compared with obesity cases that are frequently referred to family physicians in PHCCs.

The current study revealed no significant association between family adherence rate and different referral methods. This was inconsistent with Ilboudo et al. [8] (2011) who reported that families of children referred without a referral slip were less likely to adhere. However, the former study evaluated the referral slip method only, whereas the current study evaluated four different referral methods: verbal referral, referral slip, SMS, or both referral slip and SMS. Moreover, the present study revealed no significant association between adherence rate and waiting days from the visit to the school health clinic to the referral appointment, timing of appointment, or driving distance from home to the diagnostic clinic. This is in agreement with Daye et al. [22] (2018) and contrary to Shrestha et al. (2017)

Table 2. Characteristics of school health clinic visit and referral clinic

Variables	Adherent (n = 402) (57.6%)	Non-adherent (n = 296) (42.4%)	p value
Detected health problem			
Obesity	51 (12.7)	96 (32.4)	0.000^a
Dental caries	240 (59.7)	135 (45.6)	
Myopia	111 (27.6)	65 (22.0)	
Guardian accompanied the case to school health clinic (n = 694)			
One of the parents	327 (81.5)	232 (79.2)	0.011^a
Both parents	40 (10.0)	18 (6.1)	
Other than parents	34 (8.5)	43 (14.7)	
Health education regarding the detected health problem (n = 698)			
Yes	303 (75.4)	218 (73.6)	0.672
No	53 (13.2)	46 (15.6)	
I do not know	46 (11.4)	32 (10.8)	
Method of referral (n = 698)			
Verbal	151 (37.6)	131 (44.3)	0.005
SMS or referral slip	228 (56.7)	161 (54.4)	
SMS + referral slip	23 (5.7)	4 (1.3)	
Type of referral health facility (n = 698)			
PHCC	263 (65.4)	243 (82.1)	0.000
Hospital or specialized clinic	139 (34.6)	53 (17.9)	
Waiting days between school health clinic visit and referral appointment (n = 652)			
<1 week	33 (8.8)	12 (4.3)	0.000
1 week–<1 month	129 (34.3)	83 (30.1)	
≥1 month	97 (25.8)	19 (6.9)	
No appointment in referral clinic*	117 (31.1)	162 (58.7)	
Driving distance from home to referral clinic (n = 562)			
Less than 15 min	121 (34.4)	23 (11.0)	0.000
15–29 min	77 (21.9)	16 (7.6)	
30 min or more	37 (10.5)	9 (4.3)	
No appointment in referral clinic*	117 (33.2)	162 (77.1)	
Timing of referral appointment (n = 678)			
a.m.	163 (41.2)	87 (30.9)	0.000
p.m.	116 (29.3)	33 (11.7)	
No appointment in referral clinic*	117 (29.5)	162 (57.4)	
Satisfaction toward school health clinic (n = 698)			
Not satisfied	18 (4.5)	19 (6.4)	0.527
Neutral	43 (10.7)	31 (10.5)	
Satisfied	341 (84.8)	246 (83.1)	

a.m., before noon; p.m., afternoon; PHCC, primary health care center; SMS, short message service. *Either did not book at all or booked in a facility other than referral clinic. ^a χ^2 test.

[22, 23]. However, the sample in the later study included all age-groups, whereas children were reported to be less likely to adhere.

The present study highlighted the adherence rate among families of cases referred from school health clinics to diagnostic clinics and factors associated with it at a national level, including all regions of Saudi Arabia. Nonetheless, it only addressed adher-

ence rates of limited health problems in specific school grades. In addition, this study utilized a cross-sectional design in which recall bias was faced when families were asked about their previous visit to the school health clinic after 1 month. Furthermore, the family's adherence to the diagnostic clinic was self-reported, which might have introduced social desirability bias.

Table 3. Factors associated with families' adherence to diagnostic clinic

Variable	Multivariate analysis	
	aOR (95% CI)	p value
Case's age	1.24 (0.94–1.65)	0.129
Case's grade (reference: 1st primary grade)		
4th primary grade	0.49 (0.17–1.13)	0.191
1st intermediate grade	0.23 (0.04–1.35)	0.103
1st secondary grade	0.15 (0.01–2.04)	0.154
Father's age	0.99 (0.95–1.04)	0.908
Father's occupation status (reference: employee)		
Unemployed	0.56 (0.23–1.34)	0.189
Retired	0.70 (0.33–1.47)	0.344
Mother's age	0.96 (0.91–1.01)	0.116
Dependent children (reference category: 1–3 children)		
≥4 children	0.59 (0.35–1.01)	0.052
Accompany in school health clinic (reference: one of the parents)		
Both parents	1.22 (0.53–2.80)	0.641
Other than parents	1.28 (0.59–2.80)	0.532
Detected health problem (reference: obesity)		
Dental caries	8.36 (4.34–16.10)	0.000
Myopia	5.41 (2.64–11.08)	0.000
Method of referral (reference: SMS + referral slip)		
Verbal	0.28 (0.05–1.64)	0.159
SMS	0.26 (0.04–1.68)	0.158
Referral slip	0.19 (0.03–1.12)	0.066
Type of referral health facility (reference: PHCC)		
Hospital or specialized clinic	1.80 (1.02–3.17)	0.042
Waiting days between school health clinic and referral appointment (reference: more than 1 month)		
No appointment in referral clinic*	0.09 (0.02–0.35)	0.001
Less than week	5.81 (0.63–53.61)	0.121
1 week – less than 1 mo	0.65 (0.27–1.61)	0.354
Timing of referral appointment (reference: p.m.)		
No appointment in referral clinic*	0.09 (0.02–0.35)	0.001
a.m.	0.60 (0.25–1.43)	0.244
Driving distance from home to referral health appointment (reference: 30 min or more)		
No appointment in referral clinic*	0.09 (0.02–0.35)	0.001
Less than 15 min	1.45 (0.45–4.65)	0.532
15–29 min	1.84 (0.53–6.44)	0.340

SMS, short message service; PHCC, primary health care center; a.m., before noon; p.m., afternoon. *Either did not book at all or booked in a facility other than referral clinic.

Conclusion

Overall, the study revealed a low adherence rate among families of cases referred to diagnostic clinics. Additionally, the study documented that referral to PHCCs and screening positive for obesity were the main factors associated with non-adherence. As caring for children health is one of their rights, interventions to improve adherence among families

of referred cases are recommended. These interventions may include increasing awareness among families regarding the significance of adherence to referral and encouraging them to follow-up. Additionally, developing and designing a reminder system for follow-up through school health nurses, telephone calls, or digitalized reminders could increase adherence rates. Additionally, school health programs should not merely include screening and referral, but

follow-up with students and families is necessary to ensure that students receive appropriate healthcare. Moreover, the role and importance of PHCCs should be strengthened by providing substantial services, offering a variety of specialties in clinics, increasing accessibility to clinics, and familiarizing the public with the services offered, which will encourage communities to visit and return for sustainable service delivery.

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Statement of Ethics

This study protocol was reviewed and approved by the central Institutional Review Board in the Ministry of Health [21-14M], approval number [1442-1437213]. Informed consent to participate was not directly obtained but inferred by the completion of the questionnaire with voluntary participation from the participants' parent/legal guardian/next of kin to participate in the study.

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Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

A.A.A., D.M.A., and M.A.A. conceived and designed the study, conducted research, and collected and organized data. A.A.A. and D.M.A. analyzed and interpreted data. A.A.A., D.M.A., and M.A.A. wrote initial and final draft of article. A.F.A. and K.I.A. provided logistic support. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Data Availability Statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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