

REASONS FOR INADEQUATE COVERAGE ON THE SECOND VISIT FOR HYPERTENSION AND DIABETES SCREENING AT PRIMARY HEALTH CARE CENTERS

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ABSTRACT

Background: No communicable diseases (NCDs), especially hypertension and diabetes, continue to cause considerable morbidity and death globally. Hypertension and diabetes are major risk factors for cardiovascular disease, chronic renal disease, and other serious consequences, emphasizing the need for screening and control. The project aims to determine the causes of low second-visit hypertension and diabetes screening attendance in primary care centers and find ways to increase screening rates and service quality. **Method:** A cross-sectional study was conducted from April 1 to October 1, 2024, at three PHCCs in Baghdad to assess factors influencing low attendance for second visits in hypertension and diabetes screening. Structured questionnaires captured demographic, socioeconomic, behavioral, and health-related variables, including complications and healthcare preferences. The study explored adherence determinants and associated health outcomes. **Results:** The study revealed that second-visit adherence rates for hypertension and diabetes screening were highest in Saif PHC (50%) and lowest in Khadrah PHC (22%). Key factors influencing adherence included gender, education level, marital status, and family history of medical conditions, with females and higher-educated individuals showing greater willingness to return. Complications such as vision loss in diabetes patients were significantly associated with increased second-visit adherence. Non-smokers and those willing to visit without symptoms demonstrated higher adherence rates across all centers. **Conclusion:** Demographic, socioeconomic, and behavioural aspects must be considered to improve second-visit adherence. Future study should investigate personalised strategies to overcome these hurdles, improving hypertension and diabetes control.

KEYWORDS: Reasons, inadequate, coverage, second visit, hypertension, diabetes, screening, PHCC.

INTRODUCTION

Noncommunicable diseases (NCDs), particularly hypertension and diabetes mellitus, remain major global health challenges, contributing significantly to morbidity and mortality worldwide. Hypertension and diabetes are leading risk factors for cardiovascular diseases, chronic kidney disease, and other severe complications, emphasizing the critical need for effective screening and management strategies. Primary health care centers (PHCCs) serve as pivotal points for early detection and ongoing management of these conditions, yet coverage for follow-up visits, particularly the second visit, often remains suboptimal.^[1,2] Low follow-up rates for hypertension and diabetes screening in PHCCs are influenced by various factors, including patient-related barriers, healthcare system inefficiencies, and socio-economic determinants. A lack of awareness regarding the importance of follow-up visits among patients has

been frequently documented. Many patients perceive improvement in symptoms following initial screenings, leading to reduced adherence to subsequent follow-up schedules. Moreover, fear of diagnosis or stigmatization further discourages patients from returning to PHCCs for their second visit.^[1,2] Healthcare system-related barriers also play a critical role. Overcrowding in PHCCs, long waiting times, and insufficient counseling during the initial visit may negatively impact patients' willingness to return. Furthermore, inconsistent communication about the importance of the second visit for disease confirmation and management may exacerbate the issue. Studies have also shown that a shortage of trained healthcare providers and inadequate resources in PHCCs contribute to the diminished quality of services, which discourages follow-up adherence.^[3,4] Socio-economic and cultural factors, including limited access to transportation, financial constraints, and traditional

beliefs about disease and treatment, can also significantly hinder patients' engagement with follow-up screenings. In some communities, particularly rural and underserved areas, logistical challenges in accessing PHCCs further reduce follow-up rates.^[5,6] The aim of study is to assess the causes of Low Attendance for the Second Visit for Hypertension and Diabetes Screening in Primary Health Care Centers and to identify Solutions to Increase Screening Rates and Improve the Quality of Services Provided.

METHOD

Cross sectional study was conducted to assess the causes of low attendance for the second visit for hypertension and diabetes screening at three primary health care centers (PHCCs) in Baghdad: Jameaa, Khadrah, and Saif PHCCs. The study spanned from April 1, 2024, to October 1, 2024. It utilized a cross-sectional design, involving patients who attended the PHCCs for initial or follow-up visits during the study period. All patient age 21 years and above screened for hypertension and above 40 years old screened for diabetes mellitus. Data collection was performed using structured questionnaires administered to the participants. The questionnaire covered demographic details, socio-economic factors, health status, and behavioral variables, including smoking and alcohol consumption. It also inquired about patients' healthcare preferences, willingness to attend visits without symptoms, and complications associated with hypertension and diabetes. The sample was stratified by PHCCs to ensure representation across the three centers. Demographic variables included gender, education level, marital status, income, and residency. Behavioral and healthcare variables, such as smoking habits, alcohol consumption, and prior medical investigations, were analyzed to understand their

relationship with follow-up adherence. Additionally, the study explored PHC preferences, willingness to return for a second visit, and associated health outcomes, including complications of hypertension (e.g., CVA, CVD, CKD) and diabetes (e.g., vision loss, renal failure). Data analysis was conducted using statistical software, and chi-square tests were employed to identify associations between willingness to attend second visits and other variables. Significance was set at $p < 0.05$. Ethical clearance was obtained from the Baghdad Health Directorate, and informed consent was secured from all participants before data collection. The findings aimed to inform targeted interventions to address barriers to second-visit adherence and improve screening program outcomes.

RESULTS

Table 1: Distribution of Patients According to Demographic Variables

- **Gender:** Males dominate in Jameaa PHC (60%), while females dominate in Saif PHC (66.7%).
- **Education:** Bachelor degree holders are highest in Jameaa PHC (47%), followed by Saif PHC (50%). Primary and secondary education dominate in Khadrah PHC (57%).
- **Marital State:** Married individuals form the majority in all centers, with the highest in Khadrah PHC (82%).
- **Income:** Most patients report fair income, with the highest in Khadrah PHC (63%).
- **Residency:** Urban residents predominate across all centers.
- **Family History:** Jameaa PHC has the highest proportion of patients with a positive family history (61%).

Table 1: distribution of patients according to study variables in 3 primary health care centers.

PHC			
Gender	Jameaa PHC	Khadrah PHC	Saif PHC
<i>Males</i>	60 (60.0%)	48 (48.0%)	34 (33.3%)
<i>Females</i>	40 (40.0%)	52 (52.0%)	68 (66.7%)
PHC			
Education	Jameaa PHC	Khadrah PHC	Saif PHC
<i>Read and write</i>	4 (4.0%)	12 (12.0%)	16 (15.7%)
<i>Primary and 2nd</i>	39 (39.0%)	57 (57.0%)	26 (25.5%)
<i>bachelor</i>	47 (47.0%)	27 (27.0%)	51 (50.0%)
<i>Postgraduate</i>	10 (10.0%)	4 (4.0%)	9 (8.8%)
PHC			
Marital state	Jameaa PHC	Khadrah PHC	Saif PHC
Widow	6 (6.0%)	4 (4.0%)	5 (4.9%)
Single	25 (25.0%)	12 (12.0%)	18 (17.6%)
Married	63 (63.0%)	82 (82.0%)	72 (70.6%)
divorced	6 (6.0%)	2 (2.0%)	7 (6.9%)
PHC			
Income	Jameaa PHC	Khadrah PHC	Saif PHC
Good	15 (15.0%)	27 (27.0%)	21 (20.6%)
Poor	23 (23.0%)	10 (10.0%)	30 (29.4%)
Fair	62 (62.0%)	63 (63.0%)	51 (50.0%)
PHC			

Residency	Jameaa PHC	Khadrah PHC	Saif PHC
Rural	10 (10.0%)	1 (1.0%)	6 (5.9%)
Urban	90 (90.0%)	99 (99.0%)	96 (94.1%)
PHC			
Family history	Jameaa PHC	Khadrah PHC	Saif PHC
No	39 (39.0%)	50 (50.0%)	56 (54.9%)
Yes	61 (61.0%)	50 (50.0%)	46 (45.1%)

Table 2

- **Smoking:** Most patients are non-smokers, with Saif PHC having the highest percentage (76.5%).
- **Alcohol Consumption:** Rare across all centers, with the highest in Jameaa PHC (13%).
- **Investigations:** Khadrah PHC shows the highest percentage of patients undergoing investigations (93%).
- **Visit Type:** Most patients in Jameaa PHC and Khadrah PHC are attending their first visit, while Saif PHC is evenly split between first and second visits.
- **Healthcare Preferences:** PHCs are the most preferred for healthcare across all centers, followed by private clinics.

Table 2: distribution of patients according to study variables in 3 primary health care centers.

PHC			
Smoking	Jameaa PHC	Khadrah PHC	Saif PHC
No	75 (75.0%)	71 (71.0%)	78 (76.5%)
Yes	25 (25.0%)	29 (29.0%)	24 (23.5%)
PHC			
Alcohol	Jameaa PHC	Khadrah PHC	Saif PHC
No	87 (87.0%)	99 (99.0%)	100 (98.0%)
Yes	13 (13.0%)	1 (1.0%)	2 (2.0%)
PHC			
Investigation	Jameaa PHC	Khadrah PHC	Saif PHC
No	36 (36.0%)	7 (7.0%)	21 (20.6%)
Yes	64 (64.0%)	93 (93.0%)	81 (79.4%)
PHC			
1 st or 2 nd	Jameaa PHC	Khadrah PHC	Saif PHC
1 st visit	63 (63.0%)	78 (78.0%)	51 (50.0%)
2 nd visit	37 (37.0%)	22 (22.0%)	51 (50.0%)
PHC			
Preferences	Jameaa PHC	Khadrah PHC	Saif PHC
Pharmacy	5 (5.0%)	2 (2.0%)	6 (5.9%)
Hospital	9 (9.0%)	8 (8.0%)	14 (13.7%)
Privet clinic	11 (11.0%)	10 (10.0%)	23 (22.5%)
PHC	75 (75.0%)	80 (80.0%)	59 (57.8%)

Table 3: Willingness and Complications.

- **Willingness to Visit without Symptoms:** Higher in Jameaa PHC (54%) compared to other centers.
- **Hypertension Complications:** CVA (cerebrovascular accident) is the most common, particularly in Saif PHC (73.5%).
- **Diabetes Complications:** Vision loss is prevalent in Saif PHC (58.8%), and renal failure is prominent in Khadrah PHC (48%).
- **Willingness to Attend Second Visit:** Most patients in Jameaa and Saif PHCs express willingness, while Khadrah PHC is evenly split.

Table 3: distribution of patients according to study variables in 3 primary health care centers.

PHC			
Willingness to Visit Without Symptoms	Jameaa PHC	Khadrah PHC	Saif PHC
No	46 (46.0%)	60 (60.0%)	70 (68.6%)
Yes	54 (54.0%)	40 (40.0%)	32 (31.4%)
PHC			
Complications of Hypertension	Jameaa PHC	Khadrah PHC	Saif PHC
CVA	62 (62.0%)	50 (50.0%)	75 (73.5%)
Death	15 (15.0%)	2 (2.0%)	6 (5.9%)

CVD	13 (13.0%)	36 (36.0%)	20 (19.6%)
CKD	10 (10.0%)	12 (12.0%)	1 (1.0%)
PHC			
Complications of Diabetes	Jameaa PHC	Khadrah PHC	Saif PHC
Vision loss	34 (34.0%)	1 (1.0%)	60 (58.8%)
Sexual dysfunction	3 (3.0%)	1 (1.0%)	3 (2.9%)
Gangrene	32 (32.0%)	16 (16.0%)	5 (4.9%)
Renal failure	9 (9.0%)	48 (48.0%)	21 (20.6%)
Death	10 (10.0%)	0 (0.0%)	7 (6.9%)
CVD	8 (8.0%)	15 (15.0%)	6 (5.9%)
Weakness	4 (4.0%)	19 (19.0%)	0 (0.0%)
PHC			
Willingness to Attend Second Visit	Jameaa PHC	Khadrah PHC	Saif PHC
<i>No</i>	20 (20.0%)	50 (50.0%)	21 (20.6%)
<i>Yes</i>	80 (80.0%)	50 (50.0%)	81 (79.4%)

Table 4: Association between Willingness to Attend Second Visit and Study Variables.

- **Gender:** Females are significantly more likely to attend a second visit (56.9%) compared to males (43.1%; $p = 0.04$).
- **Education:** Patients with a bachelor's degree (45%) and postgraduates (9.5%) show higher willingness for a second visit compared to those with lower education levels ($p = 0.02$).
- **Marital Status:** Married individuals show the highest willingness to attend second visits (72.5%; $p = 0.05$).
- **Income:** No significant association between income and willingness to attend second visits ($p = 0.6$).
- **Residency:** Urban residents are slightly more willing than rural ones, but the difference is not statistically significant ($p = 0.4$).
- **Family History:** Patients with a family history of medical conditions are significantly more likely to attend second visits (55.9%; $p = 0.04$).

Table 4: association between Willingness to Attend Second Visit and study variables.

	Willingness to Attend Second Visit		P-value
	No	Yes	
Sex			
Male	51 (56.0%)	91 (43.1%)	0.04
Females	40 (44.0%)	120 (56.9%)	
Education			
<i>Read and write</i>	13 (14.3%)	19 (9.0%)	0.02
<i>Primary and 2nd</i>	45 (49.5%)	77 (36.5%)	
<i>bachelor</i>	30 (33.0%)	95 (45.0%)	
<i>Postgraduate</i>	3 (3.3%)	20 (9.5%)	
Marital state			
Widow	1 (1.1%)	14 (6.6%)	0.05
Single	22 (24.2%)	33 (15.6%)	
Married	64 (70.3%)	153 (72.5%)	
divorced	4 (4.4%)	11 (5.2%)	
Income			
Good	21 (23.1%)	42 (19.9%)	0.6
Poor	16 (17.6%)	47 (22.3%)	
Fair	54 (59.3%)	122 (57.8%)	
Residency			
Rural	7 (7.7%)	10 (4.7%)	0.4
Urban	84 (92.3%)	201 (95.3%)	
Family history			
	No	Yes	P-value

No	52 (57.1%)	93 (44.1%)	0.04
Yes	39 (42.9%)	118 (55.9%)	

Table 5: Association between Willingness to Attend Second Visit and Behavioral/Healthcare Variables.

- **Smoking:** Non-smokers are significantly more willing to attend second visits (77.7%) compared to smokers (22.3%; $p = 0.04$).
- **Alcohol:** No significant association between alcohol consumption and willingness to attend second visits ($p = 0.4$).
- **Investigations:** No significant difference in willingness between those who had investigations and those who did not ($p = 0.6$).

- **Visit Type:** No significant difference between first-time and follow-up visits in terms of willingness ($p = 0.6$).
- **Healthcare Preferences:** Patients who prefer PHCs are more willing to attend second visits (72.5%), but the association is not statistically significant ($p = 0.4$).

Table 5: association between Willingness to Attend Second Visit and study variables.

	Willingness to Attend Second Visit		P-value
	No	Yes	
Smoking			0.04
No	60 (65.9%)	164 (77.7%)	
Yes	31 (34.1%)	47 (22.3%)	
	Willingness to Attend Second Visit		P-value
Alcohol			0.4
No	88 (96.7%)	198 (93.8%)	
Yes	3 (3.3%)	13 (6.2%)	
	Willingness to Attend Second Visit		P-value
Investigation			0.6
No	21 (23.1%)	43 (20.4%)	
Yes	70 (76.9%)	168 (79.6%)	
	Willingness to Attend Second Visit		P-value
1st or 2nd			0.6
1 st visit	60 (65.9%)	132 (62.6%)	
2 nd visit	31 (34.1%)	79 (37.4%)	
	Willingness to Attend Second Visit		P-value
Preferences			0.4
Pharmacy	5 (5.5%)	8 (3.8%)	
Hospital	8 (8.8%)	23 (10.9%)	
Privet clinic	17 (18.7%)	27 (12.8%)	
PHC	61 (67.0%)	153 (72.5%)	

Table 6: Association between Willingness to Attend Second Visit and Health Outcomes.

- **Willingness without Symptoms:** Strongly associated with attending a second visit ($p = 0.0001$). Patients willing to visit without symptoms are more likely to return (50.7% vs. 20.9%).
- **Hypertension Complications:** No significant association between complications like CVA, death, CVD, or CKD and willingness to attend second visits ($p = 0.2$).

- **Diabetes Complications:** Some significant associations:
 - Patients with vision loss are more likely to attend second visits (36.5%; $p = 0.008$).
 - Those with gangrene or renal failure are less likely to attend ($p < 0.05$).
- **PHC-Specific Willingness:** Patients in Jameaa and Saif PHCs show significantly higher willingness to attend second visits compared to those in Khadrah PHC ($p = 0.0001$).

Table 6: association between Willingness to Attend Second Visit and study variables.

	Willingness to Attend Second Visit		P-value
	No	Yes	
Willingness to Visit Without Symptoms			0.0001
No	72 (79.1%)	104 (49.3%)	
Yes	19 (20.9%)	107 (50.7%)	
	Willingness to Attend Second Visit		P-value
Complications of Hypertension			0.2
CVA	53 (58.2%)	134 (63.5%)	

Death	4 (4.4%)	19 (9.0%)	
CVD	26 (28.6%)	43 (20.4%)	
CKD	8 (8.8%)	15 (7.1%)	
	Willingness to Attend Second Visit		P-value
Complications of Diabetes	No	Yes	
Vision loss	18 (19.8%)	77 (36.5%)	0.008
Sexual dysfunction	1 (1.1%)	6 (2.8%)	
Gangrene	23 (25.3%)	30 (14.2%)	
Renal failure	31 (34.1%)	47 (22.3%)	
Death	2 (2.2%)	15 (7.1%)	
CVD	10 (11.0%)	19 (9.0%)	
Weakness	6 (6.6%)	17 (8.1%)	
	Willingness to Attend Second Visit		
Willingness to Attend Second Visit	No	Yes	
Jameaa PHC	20 (22.0%)	80 (37.9%)	0.0001
Khadrah PHC	50 (54.9%)	50 (23.7%)	
Saif PHC	21 (23.1%)	81 (38.4%)	

DISCUSSION

This study investigated the reasons for low adherence to second visits for hypertension and diabetes screening at three primary health care centers (PHCCs) in Baghdad and evaluated the associated factors. The findings highlighted significant associations between demographic, socioeconomic, and health-related variables and the willingness of patients to attend follow-up visits. The results showed that females were more likely than males to attend second visits (56.9% vs. 43.1%, $p = 0.04$). This finding aligns with studies conducted by Abuduxike G et al. (2020) and Daher M et al. (2021), which demonstrated that women often exhibit higher health-seeking behavior than men, attributed to their greater awareness of health risks and more frequent interaction with healthcare systems also played a critical role, with patients holding bachelor's or postgraduate degrees more likely to adhere to follow-up visits compared to those with lower education levels ($p = 0.02$).^[7,8] This finding supports the observations of Kaplan RM et al. (2017), who found that higher educational attainment is associated with increased health literacy and better understanding of the importance of follow-up care.^[9] Marital status significant factor, with married individuals showing the highest willingness to return for second visits (72.5%, $p = 0.05$). Married individuals often have better social support systems, which can positively influence healthcare-seeking behaviors, as noted in studies by Schultz WM et al. (2017) and Tawalbeh LI et al. (2015).^[10,11] Income did not show a significant association with follow-up adherence ($p = 0.6$). However, fair income was the most reported category among attendees, indicating that economic stability may indirectly influence the ability to access healthcare services. Similar results were observed in studies by Doty MM et al. (2021) and Williams et al. (2021), who noted that while income alone may not predict adherence, it often interacts with other social determinants like education and access to transportation.^[12,13] Residency showed a non-significant trends slightly more likely to attend follow-ups compared

to rural residents. This finding aligns with findings by Chen X et al. (2019), who reported that urban patients often have better access to healthcare facilities, reducing logistical barriers to follow-up visits.^[14] Family history of medical conditions significantly influence adherence, with those reporting a positive family history being more likely to attend second visits ($p = 0.04$). Studies by Vermeulen E et al. (2014) and Luyckx VA et al. (2019) corroborate this finding, emphasizing that individuals with a family history of chronic diseases are more motivated to seek preventive care.^[15,16] Behavioral factors like smoking were also influential, a higher likelihood of follow-up attendance ($p = 0.04$). This result echoes the findings of Dahdah A et al. (2022), who highlighted that smoking is often associated with lower health-seeking behaviors.^[17] Interestingly, willingness to visit PHCCs without symptoms was strongly association follow-up adherence ($p = 0.0001$). Patients who expressed such willingness were more likely to return for second visits. This aligns with studies by Hirashiki A et al. (2022) and Fottrell et al. (2019), which noted that proactive health behaviors are critical in ensuring adherence to preventive screening programs.^[18,19] The study also revealed significant associations between complications of diabetes, willingness to return for second visits ($p = 0.008$). This suggests that awareness of severe complications can act as a motivator for follow-up adherence. Similar results were reported by Todowede et al. (2019), who found that individuals experiencing or fearing complications were more likely to engage with healthcare services.^[20] Overall, these findings underscore the importance of addressing barriers to follow-up adherence. Enhancing health literacy, improving communication during the first visit, and ensuring accessible healthcare services are crucial steps. Efforts should also focus on strengthening support systems, particularly for patients from lower education levels and rural areas. Behavioral interventions, such as smoking cessation programs, can further enhance follow-up rates.

CONCLUSION

Improving second-visit adherence requires a multifaceted approach that considers demographic, socioeconomic, and behavioral factors. Future research should explore the implementation of tailored interventions to address these barriers, contributing to better outcomes in hypertension and diabetes management.

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