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Caregiver Preparedness for Diabetes Complication Management in Old Age Homes: A Multicentre Cross-Sectional Study in South Kerala, India

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Abstract : Diabetes mellitus among older adults is an increasing public health challenge worldwide, particularly in countries experiencing rapid population ageing. Older adults residing in institutional care settings are vulnerable to diabetes-related complications because of multimorbidity, functional dependency and limited self-management capacity. Caregivers in old age homes play an important role in supporting medication adherence, monitoring symptoms and facilitating emergency care. However, evidence regarding caregiver preparedness for diabetes complication management in institutional elderly-care settings remains limited. (1- 4) Aim of the study is to assess caregiver preparedness, awareness and caregiving practices regarding diabetes complication management among caregivers working in old age homes across South Kerala. A multicentre analytical cross-sectional study was conducted among 213 caregivers working in selected old age homes across the South Kerala districts from Thiruvananthapuram to Alappuzha. Data were collected using a structured validated questionnaire assessing diabetes complication awareness, caregiving practices and preparedness. Descriptive and inferential statistics were analysed using SPSS version 26. Binary logistic regression analysis was performed to identify predictors associated with good preparedness. The majority of caregivers demonstrated moderate preparedness regarding diabetes complication management. Prior diabetes-care training, higher educational qualification, institutional support and longer caregiving experience were significantly associated with better preparedness scores. Although awareness regarding common diabetes symptoms was relatively adequate, practical preparedness related to diabetic foot care, emergency management and complication prevention remained insufficient. The findings highlight important gaps in caregiver preparedness in old age homes across South Kerala. Structured caregiver-training programmes and institutional diabetes-care protocols may substantially improve diabetes complication management among institutionalised older adults.

Index Terms **- Diabetes mellitus, caregiver preparedness, old age homes, institutional elderly care, diabetes complications, geriatric nursing.**

INTRODUCTION

Diabetes mellitus is one of the leading chronic diseases affecting older adults globally and has emerged as a major public health concern in ageing populations. (1-3) Population ageing and increasing life expectancy have contributed substantially to the growing burden of diabetes-related complications among older adults residing in long-term care facilities and institutional settings. (4,5)

Older adults living in institutional care facilities are particularly vulnerable to complications such as hypoglycaemia, diabetic foot ulcers, nephropathy, retinopathy and cardiovascular diseases because of multiple comorbidities, cognitive decline, functional dependency and reduced self-care capacity. (6-8) Effective diabetes management in these settings depends not only on medical supervision but also on the preparedness and competency of caregivers providing day to day support.

Caregivers in old age homes are responsible for monitoring blood glucose levels, supporting medication adherence, recognising early warning signs, assisting with dietary management and facilitating emergency referrals. (9-11) Inadequate caregiver preparedness may contribute to preventable complications, avoidable hospitalisations and poor quality of life among elderly residents. (12)

Kerala has one of the highest burdens of diabetes and ageing populations in India. (13,14) The increasing number of institutionalised older adults in the state has created additional challenges in chronic disease management within old age homes and long-term care facilities. (15)

Previous studies have reported that inadequate caregiver preparedness is associated with poor chronic disease outcomes, increased caregiver burden and reduced quality of geriatric care. (10,16,17) However, limited evidence is available regarding diabetes complication management preparedness among caregivers working in institutional elderly care settings in South Kerala.

Therefore, the present study aimed to assess caregiver preparedness, awareness and caregiving practices regarding diabetes complication management among caregivers working in old age homes across South Kerala.

OBJECTIVES

Primary Objective

To assess caregiver preparedness regarding diabetes complication management among caregivers working in old age homes.

Secondary Objectives

1. To assess caregiver awareness regarding diabetes complications.
2. To assess caregiving practices related to diabetes management.
3. To identify predictors associated with good caregiver preparedness.
4. To determine associations between demographic variables and preparedness

MATERIALS AND METHODS

Study Design

A multicentre analytical cross-sectional study was conducted.

Study Setting

The study was conducted in selected old age homes located across the South Kerala districts of Thiruvananthapuram, Kollam, Pathanamthitta, and Alappuzha. Both private and NGO-operated institutions were included.

Study Population

The study population consisted of caregivers directly involved in caring for elderly residents diagnosed with diabetes mellitus.

Sample Size

A total of 213 caregivers participated in the study.

Sampling Technique

A multistage sampling technique was adopted for participant selection.

Inclusion Criteria

- caregivers directly involved in elderly care,
- working for at least six months,
- willing to participate.

Exclusion Criteria

- temporary caregivers,
- caregivers unavailable during data collection.

Data Collection Tool

Data were collected using a structured validated questionnaire consisting of sociodemographic variables, awareness regarding diabetes complications, caregiving practice checklist, preparedness assessment scale, and institutional support checklist.

The preparedness assessment was adapted from previously validated caregiver preparedness frameworks. (9,18)

Validity and Reliability

The questionnaire was validated by experts in endocrinology, geriatrics, nursing and public health. Pilot testing was conducted among 30 caregivers. Internal consistency reliability was assessed using Cronbach's alpha coefficient.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee. Written informed consent was obtained from all participants before data collection. Confidentiality and anonymity were maintained throughout the study.

Statistical Analysis

Data analysis was performed using SPSS version 26. Descriptive statistics included frequency, percentage, mean, and standard deviation. Inferential statistics included Chi-square test, independent t-test, ANOVA, and Pearson correlation. Binary logistic regression analysis was performed to identify predictors associated with good preparedness. Statistical significance was considered at $p < 0.05$.

RESULTS

Sociodemographic Characteristics

Among the 213 caregivers included in the study, the majority were females and most participants belonged to the age group of 31-40 years. Nearly half of the caregivers had more than five years of caregiving experience, whereas less than half reported receiving prior formal training in diabetes care.

Table 1. Sociodemographic Characteristics of Participants

Sl. No	Variable		Frequency	Percentage
1	Gender	Female	167	78.4
		Male	46	21.6
2	Age	20-30 years	62	29.1
		31-40 years	88	41.3
		>40 years	63	29.6
3	Education	Secondary or Higher secondary education	74	34.7
		Diploma qualification	81	38.0
		Graduate and above	58	27.3
4	Diabetes training	Prior diabetes training	82	38.5
		No prior training	131	61.5
5	Experience as care giver	>5 years	102	47.9
		3-5 years	76	35.7
		below 3 years	35	16.4
6	Institutional diabetes protocol available	Yes	91	42.7
		No	122	57.3
7	Glucometer available in facility	Yes	148	69.5
		No	65	30.5
8	Regular physician visits available	Yes	87	40.8
		No	126	59.2
9	Institutional support adequate	Yes	104	48.8
		No	109	51.2

Awareness Regarding Diabetes Complications

Awareness regarding common diabetes complications varied among caregivers. Most participants correctly identified symptoms of hypoglycaemia and hyperglycaemia; however, awareness regarding diabetic foot complications and insulin administration safety remained comparatively lower.

Table 2. Awareness Regarding Diabetes Complications

Sl.No	Awareness Domain	Adequate Awareness (%)
1	Hypoglycaemia recognition	72.3
2	Hyperglycaemia recognition	68.5
3	Diabetic foot awareness	49.3
4	Insulin safety knowledge	44.1
5	Nephropathy awareness	39.9
6	Emergency referral awareness	57.7

Caregiving Practices

The mean caregiving practice scores indicated moderate overall performance. Medication supervision practices were relatively satisfactory, whereas routine foot-care practices and emergency management preparedness remained inadequate.

Table 3. Caregiving Practice Scores

Sl.No	Practice Domain	Mean ± SD
1	Glucose monitoring	7.8 ± 1.9
2	Medication supervision	8.2 ± 1.6
3	Dietary management	6.9 ± 2.1
4	Foot-care practices	5.1 ± 2.4
5	Emergency response	4.8 ± 2.0

Preparedness Classification

Overall preparedness regarding diabetes complication management was categorised as poor among approximately one-fourth of caregivers, moderate among more than half and good among a smaller proportion.

Table 4. Preparedness Classification

Sl.No	Preparedness Level	Frequency	Percentage
1	Poor	56	26.3
2	Moderate	109	51.2
3	Good	48	22.5

Association Between Variables and Preparedness

Significant associations were observed between caregiver preparedness and educational qualification, caregiving experience, prior diabetes training and institutional support.

Table 5. Association Between Variables and Preparedness

Sl.No	Variable	χ^2	p-value
1	Educational qualification	12.4	0.002
2	Experience >5 years	9.8	0.007
3	Prior diabetes training	18.7	<0.001
4	Institutional support	15.3	0.001

Logistic Regression Analysis

Binary logistic regression analysis demonstrated that prior diabetes training was the strongest predictor of good preparedness. Institutional support and higher educational qualification were also independently associated with improved preparedness.

Table 6. Logistic Regression Analysis

Sl.No	Predictor	Adjusted Odds Ratio	95% CI	p-value
1	Prior diabetes training	3.42	1.88-6.24	<0.001
2	Experience >5 years	2.11	1.14-3.91	0.018
3	Institutional support	2.84	1.52-5.28	0.001
4	Graduate education	1.97	1.03-3.75	0.039

DISCUSSION

The present study identified important gaps in caregiver preparedness regarding diabetes complication management among caregivers working in old age homes across South Kerala.

Although caregivers demonstrated moderate awareness regarding common diabetes symptoms, practical preparedness related to diabetic foot care, emergency management and complication prevention remained insufficient. These findings are consistent with previous studies examining chronic disease management among institutionalised older adults. (4,5,15)

The study also demonstrated that prior diabetes training was strongly associated with better preparedness scores. Caregivers who had received formal training showed significantly improved awareness and caregiving practices compared with untrained caregivers. Similar findings have been reported in caregiver preparedness and diabetes self-management education studies. (9,17,19)

Institutional support emerged as another important predictor of preparedness. Availability of diabetes-care protocols, emergency support systems and basic monitoring equipment may contribute substantially towards improved caregiving competency. (10,11)

The findings are particularly important in the context of Kerala, where the burden of diabetes and population ageing continues to increase rapidly. (13,14) Strengthening caregiver preparedness in old age homes may contribute towards reducing preventable complications and improving the quality of geriatric diabetes care.

LIMITATIONS

The study has certain limitations. The cross-sectional design limits causal interpretation. Some caregiving practices were self-reported and may therefore be subject to reporting bias. In addition, the study was limited to selected districts of South Kerala and may not be generalisable to all institutional elderly care settings.

CONCLUSION

The study highlights important gaps in caregiver preparedness regarding diabetes complication management in old age homes across South Kerala. Although moderate awareness regarding diabetes was observed, practical preparedness related to complication prevention and emergency management remained inadequate.

Prior diabetes-care training, institutional support and caregiving experience were significantly associated with improved preparedness. The findings emphasise the need for structured caregiver-training programmes and institutional diabetes-care protocols to strengthen diabetes complication management among institutionalised older adults.

Future intervention studies are recommended to evaluate the effectiveness of contextualised educational programmes aimed at improving caregiver competency and diabetes-care outcomes in elderly-care institutions.

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