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Assessment of Impact of Socio-economic Status on Knowledge, Attitude, and Practice in Hypertension Patients with Comorbidity of Type 2 Diabetes Mellitus

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Abstract: Socio-economic status (SES) and knowledge, attitude, and practice are the essential determinants of health outcomes in patients with hypertension and Type 2 Diabetes Mellitus. The main aim of this study was to assess the knowledge, attitude and practice in cases with Hypertension and Type-2 Diabetes Mellitus and to evaluate the impact of socio-economic status on KAP (knowledge, attitude, and practice). Our study found that the highest cases (58%) were in the age of 46-65 years. Males have better KAP than females. People aged 31-45 years had better KAP than 46-65 years and >65 years. People with higher SES status had better KAP than those with lesser SES. Socio-economic status had a strong influence on KAP. In the overall study, 152 cases had adequate KAP, 90 cases had inadequate KAP, and 58 cases had poor KAP. By understanding the knowledge, attitude, and practice of patients with comorbid hypertension and Type 2 Diabetes Mellitus, healthcare professionals can tailor their interventions to meet the specific needs of these patients, ultimately leading to better health outcomes and improved quality of life.

Keywords: Attitude, Health outcomes, Hypertension, Knowledge, Socio-economic status, Type 2 Diabetes Mellitus

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Introduction

Hypertension and Type 2 Diabetes Mellitus are two common and interrelated chronic diseases that have become major public health concerns worldwide (Petrie *et al.*, 2017). Patients with

hypertension and Type 2 Diabetes Mellitus are at higher risk of developing cardiovascular disease and other complications. In recent years, the coexistence of hypertension and Type 2 Diabetes

Mellitus has become increasingly prevalent, with estimates suggesting that up to 50% of patients with Type 2 Diabetes Mellitus also have hypertension (Einarson *et al.*, 2018). Managing these two conditions can be complex, requiring a multidisciplinary approach that involves the coordination of various healthcare professionals. Moreover, it is essential to understand the knowledge, attitude, and practice of patients with comorbid hypertension and Type 2 Diabetes Mellitus to manage their conditions to provide adequate and appropriate care (Powers *et al.*, 2016).

Knowledge, attitude, and practice are three key components influencing patient behavior and ultimately affecting their health outcomes. Knowledge refers to the patient's understanding of their condition, including its causes, symptoms, and potential complications (Liu *et al.*, 2016). Attitude refers to the patient's beliefs, emotions, and perceptions about their condition and its management. Practice refers to the patient's actions and behaviors related to their condition, including adherence to medication, lifestyle modifications, and follow-up appointments with healthcare professionals (Jin *et al.*, 2008).

Socio-economic status (SES) is an essential determinant of health outcomes, including the knowledge, attitude, and practice of patients with hypertension and Type 2 Diabetes Mellitus. Patients with lower SES may have limited access to healthcare services, including screening and treatment for hypertension and Type 2 Diabetes Mellitus. This can lead to poor knowledge, attitude, and practice in managing their conditions (Rahman *et al.*, 2020). In contrast, patients with higher SES may have better access to healthcare services, including screening and treatment, which can lead to better knowledge, attitude, and practice in managing their conditions. Patients with higher SES may also have more significant financial resources, facilitating better adherence to treatment regimens (McMaughan *et al.*, 2020).

The findings of this study help healthcare professionals develop effective strategies to

improve patient outcomes and enhance the quality of care provided to these patients.

Materials and Methods

A prospective observational study was done by collecting the data of a patient with hypertension and comorbidity of Type-2 Diabetes mellitus to assess the impact of socio-economic status on Knowledge, Attitude, and Practice in managing disorder in these patients. The study was conducted in Mamatha General Hospital located in Khammam for 6 consecutive months from September 2022 to February 2023 by including 300 patients based on the inclusion criteria- Patients who were diagnosed with both hypertension and Type -2 Diabetes Mellitus, Patients with the age group of above 20 years, Patients of both gender, Patients who have been treated on an inpatient basis, Patients interested in participating in the study were included. Lactating Women, Pregnant women, and Patients with an Age limit below 20 years and Patients not willing to participate were excluded from the study. The Statistical Analysis was done by Microsoft Office (MS- Word, MS- Excel).

Results

Out of 300 cases, it was found that the incidence of Hypertension and Diabetes Mellitus was maximum in the age of 46-65 years, which includes 174 patients (58%), followed by the age of 31-45 years and 65> years which includes 58 (19.33%) and 51 (17%) patients and the minimal incidence was found in the age of 20-30 years which is about 5.67%. The results are shown in Figure 1.

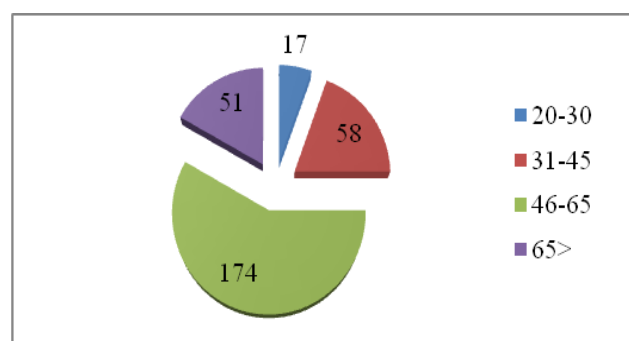


Fig. 1: Age-wise distribution of patients.

Based on Gender distribution, out of 300 patients, 185 males (61.67%) and 115 females (38.33%) were affected with hypertension and diabetes (Fig. 2). The basis of KAP studies shows that males had more adequate KAP than females. The results are shown in Figure 2.

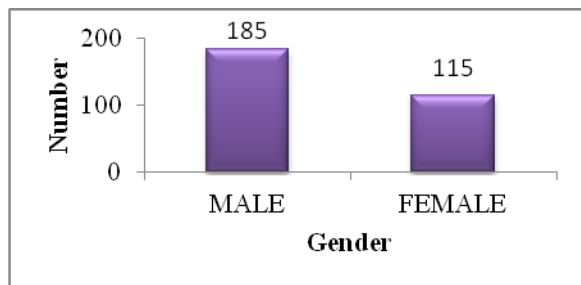


Fig. 2: Gender distribution of Patients.

Cases with young age had adequate knowledge (13), attitude (13), and practice (8) (Table 1). Progression of age affected attitude and practice as we can see from our study that people with higher age 46-65 years had poor attitude (80) and practice (86), even though the knowledge was adequate (120). Statistical analysis was performed using the Chi-Square Test; age distribution's impact on KAP was assessed and found to be significant (Table 1).

Our studies found that males have more knowledge (128) and attitude (94), but the practice needs improvement. Similarly, the females have adequate knowledge (71) and attitude (58) and poor in practice. In comparison to gender, males had better KAP than females. Statistical analysis was performed using the Chi-Square Test, and the impact of gender distribution on KAP was assessed and found to be significant knowledge (Table 1).

In our study, we have categorized gender with age group. Males were more significant in the age 46-65 (117) followed by >66 (30). Similarly, females were also higher in the age 46-65 (57) followed by 31 in the 31-45 year age group.

Out of 300 patients, 187 (62.33%) have a family history of hypertension with diabetes, and 113 (37.67%) patients have no family history of hypertension with diabetes. The incidence was

maximum in subjects with a family history compared to patients without one.

Based on the distribution of family history in males and females of hypertension with diabetes, we observed that males (113) and females (74) in a total of 187 subjects have a family history of hypertension with diabetes.

Out of 300 cases, 151 (50.33%) are shown to be residents of rural areas and 149 (49.67%) of cases were shown to be urban residents. We have graded both rural and urban residents having relatively the same hypertension with diabetes.

Distribution of residence based on gender:

Out of 300 cases in total, 149 urban distribution males with 91(61.05%) cases and females with 58(38.95%), and in total, 151 rural distribution males with 94 (62.26%) cases and females with 57 (37.74%) By performing statistical analysis by using the chi-square p test, the impact of hypertension with diabetes in females were less than males in both rural and urban residents were found to be significant (chi-square p-value). The results are shown in Figure 3.

In our study, based on their educational levels, we observed that subjects from different educational backgrounds have relatively adequate knowledge and attitude. However, when coming to practice, it needs to be improved. These subjects also have adequate knowledge and attitude, but the illiterates must practice. By performing statistical analysis using the chi-square p-test, the influence of education on female and male values was found to be significant in both males and females of different educational backgrounds (Table 2).

Based on the different statuses of incomes of subjects, we observed that from highest income subjects to lowest income subjects there are adequate quantities of knowledge about their hypertension with diabetes condition, the attitude is somewhat inadequate in different income status subjects, and coming to practice it is poor in all the different levels of income statuses subjects.

Table 1: Influence of Age and Gender on KAP Studies

Age	Knowledge			Attitude			Practice		
	A	B	C	A	B	C	A	B	C
20-30	13	3	1	13	0	4	8	3	6
31-45	43	9	6	38	4	16	13	22	23
46-65	120	40	14	80	14	80	33	55	86
65>	23	12	16	18	3	30	4	14	33
P value	0.045			0.007			0.009		
Male	128	43	14	94	44	47	41	63	81
Female	71	21	23	58	46	11	17	31	67
P value	0.0042			0.0004			0.046		

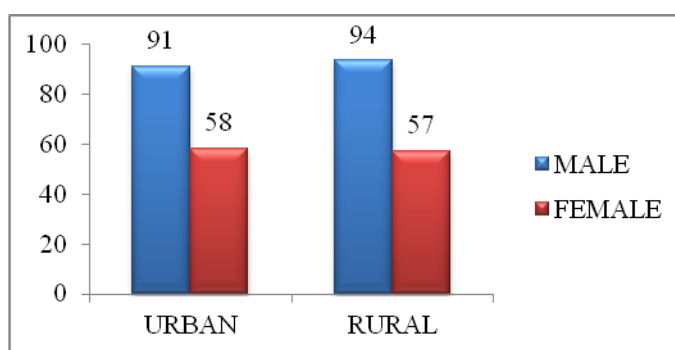


Fig. 3: Distribution of residence based on gender.

Table 2: Influence of education on KAP studies

Education	Knowledge			Attitude			Practice		
	A	B	C	A	B	C	A	B	C
Professional Degree	7	1	1	6	1	2	2	2	5
Graduate	49	6	1	41	3	12	20	25	11
Intermediate/diploma	6	1	1	6	0	2	2	2	4
High school	49	18	4	35	4	32	11	30	30
Secondary education	19	6	2	14	3	10	9	10	8
Primary education	11	3	2	4	0	12	3	3	10
Illiterate	57	29	27	42	10	61	11	22	80
P value	0.0007			0.001			0.0000004		

Statistical analysis was performed using the Chi-Square Test, and the influence of income distribution on KAP was assessed and found to be significant (Table 3).

According to subject occupation, their changes in KAP were observed and any occupation subjects had better knowledge and relatively good attitudes, but the practice is poor. KAP is in the

form of descending order about subject occupations. Statistical analysis was performed using the Chi-Square Test, and the influence of occupation distribution on KAP was assessed and found to be significant (Table 4).

Based on the subject's socio-economic status, we observed that upper-class subjects (2) had adequate KAP, upper middle, lower middle and

Table 3: Influence of Income on KAP Studies

Income	Knowledge			Attitude			Practice		
	A	B	C	A	B	C	A	B	C
92951-185894	2	0	0	2	0	0	0	1	1
69535-92950	8	0	1	5	4	0	4	2	3
46475-69534	30	10	3	23	3	17	14	15	14
27883-46474	45	8	2	25	7	23	13	26	16
9308-27882	104	41	24	79	14	76	25	48	96
≤9307	10	5	7	8	3	11	0	1	1
P value	0.018			0.033			0.001		

Table 4: Influence of Occupation on KAP Studies

Occupation	Knowledge			Attitude			Practice		
	A	B	C	A	B	C	A	B	C
Professional	64	19	5	50	4	34	19	30	39
Semi Professional	54	15	3	39	8	25	22	29	21
Agriculture	16	9	7	5	3	24	3	5	24
Semi Skilled Worker	4	4	4	5	1	6	0	3	9
Unemployed	61	17	18	50	5	41	14	27	55
P value	0.041			0.006			0.0027		

Table 5: Influence of socio-economic status on KAP studies

SES	Knowledge			Attitude			Practice		
	A	B	C	A	B	C	A	B	C
Upper	2	0	0	2	0	0	2	0	0
Upper Middle	55	12	1	43	8	17	28	22	18
Lower Middle	64	22	7	36	10	47	19	36	38
Upper Lower	55	22	19	38	6	52	17	22	57
Lower	23	8	10	13	3	25	3	5	33
P Value	0.002			0.004			0.000004		

upper lower subjects had adequate knowledge and an attitude better, but the practice was poor. Lower-class subjects had adequate knowledge (23), inadequate attitude (25), and practice (33) conditions. Statistical analysis was performed using the Chi-Square Test, and the influence of socio-economic status on KAP was assessed and found to be significant (Table 5).

Out of 300 patients divided by socio-economic

status, upper 2 (0.66%), upper middle 68 (22.66%), lower middle 93 (31%), upper lower 96 (32%), and lower 41 (13.66%) were found. The results are shown in Figure 4.

In category A we observed 152 (50.66%), in B category 90 (30%), and in C category 58 (19.33%) many subjects with KAP. The highest percentage was observed in the A category, and the lowest is in the C category (Fig. 5).

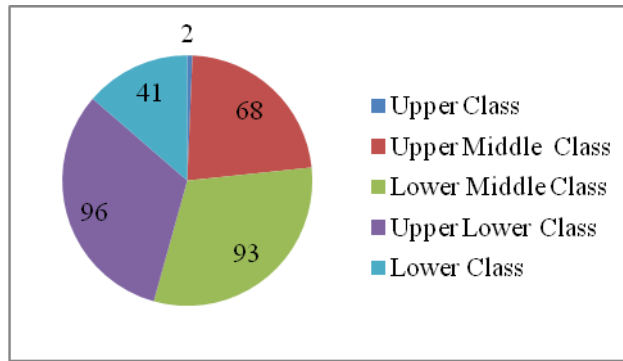


Fig. 4: Impact of socio-economic status on KAP studies.

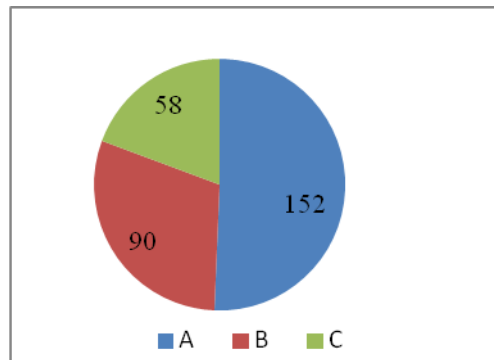


Fig. 5: Category-wise assessment of KAP.

Discussion

Hypertension (HTN) and Diabetes mellitus (DM) are common diseases that coexist at a greater frequency. Diabetes mellitus and hypertension are the most common diseases and cardiovascular risk factors. Hypertension in the diabetic person markedly increases the risk and accelerates cardiac disease, peripheral vascular disease, stroke, Diabetic retinopathy, and nephropathy. Nowadays, people such as illiterates, high professionals, and people with significantly less economic status need to understand the disease and decrease the risk of the disease.

As per our study, most individuals with Hypertension and Diabetes Mellitus are seen in the age groups of 46-65. So the age group of 46-65 is affected more by Hypertension and Diabetes Mellitus, which can be attributed to their social habits, and even age progression can affect the body metabolism. In our study, many patients

aged 46-65 have adequate knowledge and attitude but poor practice. Our study contrasts with a study conducted by Mounica (2015), where most correspondents are with good KAP. As per our study, males are more affected by Hypertension and Diabetes Mellitus whereas females are less subjected to the disease. However, according to a study by Aubert *et al.* (1998), females are more affected by the disease. Our study shows male patients are more habituated to social habits such as alcohol and cigarette smoking. Hence the incidence of males when compared with female patients is more.

In this study, among the total number of people, people with social history are highly affected by DM and HTN. Male patients (95.34%) are highly affected by social history compared to female patients (4.69%). On this point, our study closely resembles the studies of Mahajan *et al.* (2012) and Li *et al.* (2021).

As per our study, most of the patients have a family history of the disease, 62.33%, compared with the patients who do not have a family history, 37.67%. The presence of family history also has the chance of increasing the risk of the disease. Our study shows similar results when compared to studies of Ranasinghe *et al.* (2015).

According to our study, males (60.45%) have more family history when compared to females (39.55%). Based on this comparison, our study contrasts with studies of Ranasinghe *et al.* (2015). In their study, females are highly affected by family history, whereas in our study, most male patients are exposed to family history.

As per our study, under the residence factor, the residence does not impact the prevalence of disease as the number of cases reported. Where similar in both urban and rural areas. Our study is in contrast with Geldsetzer *et al.* (2017). In their study, subjects who were from rural areas acquired the disease.

Under gender basis, males are reported to have a very high prevalence of DM and HTN in both urban (91) and rural areas (94), to females in both urban (58) and rural (57) areas. It shows that rural patients need to know about the disease compared to urban patients. Our study shows nearly similar results to the study of Geldsetzer *et al.* (2017) based on the gender-wise distribution of residence.

Our study shows that individuals with education bias show remarkable differences in KAP scores. People who graduated high schoolers have better knowledge and attitude scores than practice. People with high-level education may have adequate knowledge about the diseases, but they cannot make it into practice due to their lack of time and busy life. At the same time, patients with professional degrees, diplomas, and primary education have very low-level scores in KAP and need to improve their understanding of the disease. People with a low level of education find it difficult to manage the disease and have poor KAP. Our study is almost similar to studies of Monica

(2015), as illiterate patients have Poor knowledge of the disease and ignorance of the need for long-term treatment, Religious practices and culture, and Inadequate access to medical facilities, hence, will have poor KAP.

In our study, patients with a low-income level of <30000 to >10000 have better knowledge and attitude but need more practice. They understand the disease well, but due to their busy life, patients cannot make it into practice. Patients with adequate income levels have poor KAP scores; this shows that patients need to be well counseled and make them understand the disease to avoid various complications. Our study differs from Le *et al.* (2021) studies, based on significant scores.

According to our study, semiskilled workers have very low KAP scores. It may be because of their economic status, inadequate knowledge of the disease, or lack of interest. Professionals, semi-professionals, and unemployed patients have nearly high knowledge, attitude, and practice levels. Our study is in contrast with the study of Doubova *et al.* (2018) study.

As per our study, individuals with upper socioeconomic status have very poor KAP status. People with upper middle, lower middle, and upper lower classes have near similar values of knowledge and attitude scores but are poor in practice. The knowledge and understanding of Hypertension and Diabetes should be improved through patient counseling before the diseases worsen. Our study is in contrast with the study of Corsi and Subramanian (2019).

In our study, as per the data collection, there is a nearly equal number of patients of lower middle and upper lower status. An average number of patients are in the lower and upper middle classes. There are only two patients who belong to the upper class due to the locality of the hospital. Patients who lack knowledge of the disease need to be educated or well-counseled. Patients with very low practice scores must be counseled to improve their Practice in disease monitoring. As per our study and data collection, the social

history and family history of the affected people significantly worsened the disease. Patient counseling and Awareness programs can be conducted in rural or urban areas to lower the risk of Hypertension and Diabetes.

Conclusion

In our study, we categorized all the patients according to age group and found that the highest cases were 58% in the age of 46-65. Knowledge and attitude were adequate in both genders but could have been better in practice. Males have better KAP than females. People aged 31-45 had better KAP than 46-65 and >65. People with higher educational status had better KAP than people with lesser levels of education. People with more income had good KAP. People with less income had adequate awareness but needed to improve in practice. People engaged in professional work had good KAP than people involved in unprofessional work. Socio-economic status had a strong influence on KAP. People with the classes of lower middle and upper lower had inadequate KAP in contrast to upper-class people. In the overall study, 152 cases had adequate KAP, 90 cases had inadequate KAP, and 58 cases had poor KAP. Therefore, healthcare professionals need to consider the impact of SES on the knowledge, attitude, and practice of patients with hypertension and Type 2 Diabetes Mellitus. Healthcare professionals can also work to improve access to healthcare services for patients with lower SES, including providing low-cost or free screening and treatment options. Addressing the impact of SES on the knowledge, attitude, and practice of patients with hypertension and Type 2 Diabetes Mellitus can help improve health outcomes and reduce health disparities.

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