



## Comparison of Knowledge, Attitude and Practice in self reported diabetics in tertiary eye care center in Sewagram and self reported diabetics in villages in Wardha District, Maharashtra, India.

### KEYWORDS

NPDR Non-Proliferative Diabetic Retinopathy, PDR Proliferative Diabetic Retinopathy, KAP Knowledge, attitudes and practice.

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### ABSTRACT

**AIM:** To determine and compare current levels of knowledge, attitude and practice patterns in known diabetics attending hospital and amongst diabetic patients in villages.

**METHODS:** 307 known diabetics coming to hospital for screening (group1) and 300 known diabetics in the villages (group2) were evaluated and knowledge-attitude-practice regarding diabetic retinopathy was determined.

**RESULTS:** Majority 58.3% among hospital patients knew that diabetic retinopathy is a complication of diabetes as compared to only 18% of camp patients. Group 1 had better knowledge about diabetic retinopathy than group2. Attitude for eye checkup was poor both in group 1 and 2. Practices regarding need for eye checkup followed by patients in both groups were similar.

**CONCLUSIONS:** The sex, literacy, occupational status, economic status and duration of diabetes mellitus were factors that were found to be significantly associated with knowledge, attitude and practices of the patients.

### INTRODUCTION

Guidelines published by World Health Organization (WHO) in 2006 called DR "a leading cause of new-onset blindness and a more and more frequent cause of blindness in middle-income countries."<sup>1</sup>

This is an emerging problem and is likely to get compounded by changing life styles and ageing of the population. Thus, the need is to develop the capacity for treatment as well as mechanisms that can screen the diabetics at the first level and at the second level those who have developed diabetic retinopathy.<sup>2</sup>

This indicates that the diabetes patients should have good knowledge, attitude and practices. Effective management of disease, control of risk factors associated with the disease, its diagnosis and prevention awareness are associated with knowledge, attitude and practice among patients.<sup>3</sup>

This "KAP" study was conducted to know and compare the Knowledge, Attitude and Practices of the known diabetic patients attending hospital and those that were screened in the villages.

Thus the aim of this study was to determine and compare current levels of knowledge, attitude and practice patterns in known diabetics attending hospital and amongst diabetic patients in villages.

### MATERIALS AND METHODS

It was a Prospective Observational study conducted in two kinds of patients from 1<sup>st</sup> Jan 2015 to 1<sup>st</sup> Sept 2016. All were known diabetics with age >40 yrs. The two groups were

- Hospital – Diabetic patients attending Kasturba hospital, Sewagram.
- Camp - Diabetic patients from outreach screening camps which were conducted in the villages in Wardha district, Maharashtra.

A proposal of this study was prepared, presented and approved by the department of ophthalmology and research and ethics committee. A total of 307 known diabetic patients were randomly recruited from both the outpatient clinics and the general medical and general

surgical inpatient wards from the hospital and 300 diabetic patients were recruited from the door-to-door survey of all the households of a selected village. Knowledge, attitude and practice (KAP) was the primary outcome variable in this study. The study was conducted on a total of 607 type II diabetics.

Semi structured questionnaires were constructed for face to face interviews with diabetic patients which was performed according to the guidelines of the declaration of Helsinki<sup>4</sup> and approval was sought from the Ethics Committee of the institute.

Patients below 40 years and those with mental illness were excluded from the study. Eligible diabetic patient was interviewed only once during the study period.

All patients were examined for presence or absence and severity of retinopathy which was graded according to the ETDRS classification of diabetic retinopathy. Whichever patient required investigations and treatment for diabetic retinopathy was admitted and further investigations were carried out.

The next part which contained data on knowledge, attitude and practices was filled on the questionnaire as the patient gave his/her responses. The questionnaire had 18 questions based on knowledge, attitude and practices of diabetes and its eye complications. Consent forms were also translated into two regional languages. Patients were interviewed to assess their knowledge of diabetes and DR, to assess their health seeking behaviour and the challenges they face in controlling their diabetes and/or in accessing services.

### STATISTICAL ANALYSIS

Knowledge was measured using a 8-item questionnaire relating to general knowledge about diabetes and its ocular complications. There were 8 questions out of which 3 questions were multiple choice questions and for each correct answer +1 score was given and for other 5 questions yes was given +1 and no and don't know were given 0. The sum of the scores of all the questions denoted the knowledge score of an individual, which ranged from minimum 0 to maximum score of 10. The population was divided into two groups: those with "good knowledge" (score 6-10) and those with "poor knowledge" (score 0-5).

Attitude was measured using a 4-item questionnaire that was scored and a cut-off given to indicate attitude levels of patients towards screening of DR. The five-point Likert-type scale (strongly disagree, moderately disagree, neutral, moderately agree, and strongly agree) was used and the responses were assigned scores as 1 to strongly disagree, 2 to moderately disagree, 3 to neutral, 4 to moderately agree, and 5 to strongly agree. Thus, all the scores were summed up to derive the attitude score of the population ranging from minimum 4 to maximum score 20. Similar to the knowledge score, the population was divided into those with "good attitude" (13-20) and "poor attitude" (4-12).

Practice was measured using a 6-item questionnaire with mixed type of response out of which 1 question was multiple choice question. For multiple choice questions, each correct answer was given +1 and for other 5 questions yes was given +1 and no and don't know were given 0. Thus total score ranged from 0 to 8 higher score indicating higher level of practice. Practices were analysed and presented as proportions and divided again into good practice (score 5-8) and poor practice (score 0-4).

In the end the total of knowledge, Attitude and Practice scores was done and patients were divided into those having good KAP (score 25-38) and poor KAP (score 4-24). The questions for the study were validated by pre-testing on a representative group of diabetic patient (10 patients).

The data collected was coded, entered and managed into Microsoft Excel database. Statistical analysis was done by using descriptive and inferential statistics using "chi square test" and "z test" for difference between two means. Software used for analysis were SPSS 17.0 version, EPI INFO 6.0 version and GraphPad prism 6.0 version. All statistical tests were performed at 5% level of significance (95% confidence interval) and p<0.05 was considered significant.

**RESULTS**

The present study was conducted in a total of 607 patients >40 years of age, out of which 307 were from hospital and 300 were from camp. Out of all the 607 diabetic patients it was found that all the patients had type 2 diabetes. The age and sex distribution among the hospital and camp patients was similar. The patients were aged between 40 and 85 years with the mean age being 59.53 ± 9.9 years in hospital patients and 59.32 ± 10.6 years in camp patients. Patients coming to hospital had a better socioeconomic status as compared to patients who were screened in the villages. Among hospital patients 211(68.72%) patients had per capita monthly income of > Rs.1800 and 96(31.27%) patients had per capita monthly income between Rs.1800 to <900. The per capita income was higher in the hospital patients as compared to the camp patients Among camp patients 16(5.33%) patients had per capita monthly income of > Rs.1800 and 284(94.66%) patients had per capita monthly income between Rs.1800 to <900.

There was a significant difference in the literacy levels of the hospital and camp patients, the literacy levels being higher in the hospital patients as compared to the camp patients.

Out of 307 hospital patients, majority of hospital patients 179(58.30%) had formal education > 10<sup>th</sup> standard. Remaining 128(41.69%) had formal education of < 10<sup>th</sup> standard and 46 (35.93%) of them were illiterate.

Out of 300 camp patients, Majority 180 (60.0%) had formal education of < 10<sup>th</sup> standard. Remaining 120(40.0%) patients had formal education more than 10<sup>th</sup>.

In both the groups majority of patients were housewives, 123(40.07%) in hospital and 127(50.8%) in camp. Out of 300 camp patients, farmers 101(33.67%) constituted next major population group which was not seen among the hospital patients where patients in service were 68 (22.15%).

When the knowledge responses of both groups were compared and analysed, among hospital patients 76 (24.8%) had poor knowledge and 231 (75.2%) had good knowledge. (Table 1 Figure 1a) Among camp patients, 185 (61.7%) patients had poor knowledge and 115 (38.3%) had good knowledge. (Table 1 Figure 1b) Thus, there was a significant difference in the knowledge scores of hospital and camp patients, the knowledge scores of hospital patients being better than those of camp patients.

When the attitude responses of both groups were compared and analysed, among hospital patients 153 (49.83%) had poor attitude and 154 (50.16%) had good attitude. (Table 1 Figure 1a) Among camp patients, 260 (86.66%) patients had poor attitude and 40 (13.33%) had good attitude. (Table 1 Figure 1b) Both the hospital as well as the camp patients had similar level of attitude towards diabetic retinopathy but hospital patients still had a better attitude as compared to camp patients.

When the practice responses of both groups were compared and analysed, among hospital patients 24 (7.81%) had poor practice and 283 (92.18%) had good practice. (Table 1 Figure 1a) Among camp patients, 248 (82.6%) patients had poor practice and 52 (17.3%) had good practice. (Table 1 Figure 1b) Thus, hospital patients showed better practices as compared to camp patients.

When the total KAP scores of both groups were compared and analysed, among hospital patients 246 (80.13%) had good KAP score and 61 (19.87%) had poor KAP score. (Table 1 Figure 1a) Among camp patients, 55 (18.33%) patients had good KAP scores and 245 (81.67%) had poor KAP score. (Table 1 Figure 1b) Hospital patients showed better KAP as compared to camp patients. When the KAP scores of both the groups were analysed they were found to be statistically significant.

**Table 1 : Good and poor scores of KAP in hospital and camp patients**

	No. of patients (%)		
	Hospital n=307	Camp n=300	Total n=607
<b>Knowledge Score</b>			
Good (6-10)	231 (75.2%)	115 (38.3%)	346 (57%)
Poor (0-5)	76 (24.8%)	185 (61.7%)	261 (42.9%)
<b>Attitude Score</b>			
Good (13-20)	154 (50.16%)	40 (13.3%)	194 (31.6%)
Poor (4-12)	153 (49.84%)	260 (86.6%)	413 (68.03%)
<b>Practice Score</b>			
Good (5-8)	283 (92.18%)	52 (17.3%)	335 (55.19%)
Poor (0-4)	24 (7.81%)	248 (82.6%)	272 (44.81%)
<b>Total KAP Score</b>			
Good (25-39)	246 (80.13%)	55 (18.33%)	301 (49.5%)
Poor (4-24)	61 (19.87%)	245 (81.67%)	306 (50.4%)

**Figure 1a : Good and poor scores of KAP in hospital patients**

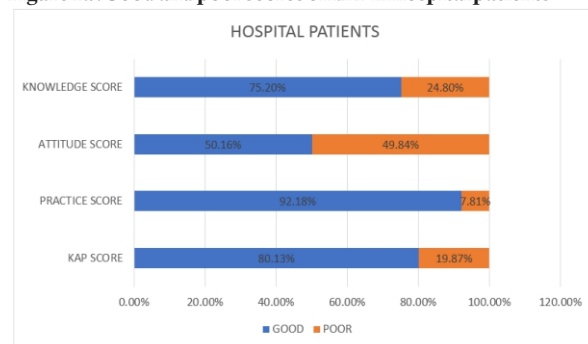
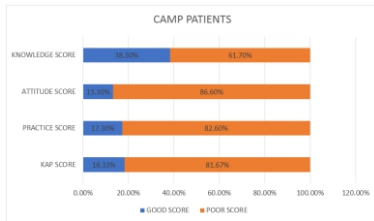


Figure 1b : Good and poor scores of KAP in camp patients



The people in “good” and “poor” knowledge, attitude and practice groups were then analysed statistically using the  $\chi^2$ -test for association with variables such as sex, literacy and duration of diabetes mellitus. The value of  $P < 0.05$  was considered statistically significant.

1. On statistical analysis, sex had significant association with good attitude ( $p=0.002$ ) and good practice patterns ( $p=0.0001$ ) showing that females had a better attitude and better practice patterns as compared to males. (Table 2)
2. Literacy showed a significant association with good knowledge ( $p=0.002$ ), good attitude ( $p=0.002$ ) and good practice culture ( $p < 0.001$ ). (Table 2)
3. Duration of diabetes mellitus showed significant association with possessing good knowledge ( $p < 0.045$ ) showing that as the duration of disease increases patient is more aware of DR and has better knowledge scores. Attitude ( $p=0.24$ ) and practice patterns ( $p=0.27$ ) did have any association with duration of diabetes. (Table 2)
4. Socioeconomic status of the patients also showed significant association with possessing good knowledge ( $p < 0.001$ ), good attitude ( $p = 0.0001$ ) and good practice patterns ( $p = 0.0001$ ). (Table 2)
5. Occupation of the patient also showed significant association with possessing good knowledge ( $p < 0.001$ ) but there was no association with attitude and practice patterns. (Table 2)
6. The difference in KAP scores was not significant with presence or absence of diabetic retinopathy. (Table 2)

Table 2: Factors influencing knowledge, attitude and practice in the study population

	Knowledge n=607			Attitude n=607			Practice n=607		
	Good (%)	Poor (%)	p value	Good (%)	Poor (%)	p value	Good (%)	Poor (%)	p value
<b>Sex</b>									
<b>Male</b>	196 (32.2)	142 (23.3)	0.62 NS	36 (5.9)	126 (20.7)	0.002 2 S	108 (17.7)	54 (8.8)	0.000 1 S
<b>Female</b>	150 (24.7)	119 (19.6)		158 (26)	287 (47.2)		366 (60.2)	79 (13)	
<b>Education</b>									
<b>Illiterate</b>	80 (13.1)	82 (13.5)	0.002 2 S	36 (5.9)	126 (0.7)	0.002 2 S	108 (17.7)	54 (8.8)	0.000 1 S
<b>Literate</b>	266 (43.8)	179 (29.4)		158 (26)	287 (47.2)		366 (60.2)	79 (13)	
<b>Duration of DM</b>									
<b>&lt;5 years</b>	263 (43.3)	216 (35.5)	<0.04 5 S	159 (26.1)	320 (52.7)	0.24 NS	369 (60.7)	110 (18.1)	0.27 NS
<b>&gt;5 years</b>	83 (13.6)	45 (7.4)		35 (5.7)	93 (15.3)		105 (17.2)	23 (3.7)	
<b>Socioeconomic status</b>									
<b>High</b>	174 (28.6)	53 (8.7)	<0.00 1 S	110 (18.1)	117 (19.2)	0.000 1 S	195 (32.1)	32 (5.2)	0.000 1 S
<b>Low</b>	172 (28.3)	208 (34.2)		84 (13.8)	296 (48.7)		138 (22.7)	242 (39.8)	
<b>Occupation</b>									
<b>Unemployed</b>	182 (29.9)	124 (20.4)	0.000 1 S	106 (17.4)	198 (32.6)	0.139 NS	174 (28.6)	130 (21.4)	0.19 NS

Employed	162 (26.6)	139 (22.8)		88 (14.4)	215 (35.4)		159 (26.1)	144 (23.7)	
<b>Presence of Diabetic Retinopathy</b>									
<b>Absent</b>	264 (43.4)	215 (35.4)	0.16 NS	150 (24.7)	329 (54.2)	0.52 NS	256 (42.1)	223 (36.7)	0.19 NS
<b>Present</b>	82 (13.5)	46 (7.5)		44 (7.2)	84 (13.8)		77 (12.6)	51 (8.4)	

**DISCUSSION**

It is well known fact that prolonged duration of disease results in various disease-associated complications mainly as a result of ignorance and poor disease control. This leads to the disease-related morbidity. Thus, the main objective of this study was to ascertain the awareness level and the practice patterns of the people.

Among hospital patients majority 51.7% knew that diabetes affects vision in comparison to camp patients in whom more than half 65.67% did not know that diabetes affects vision. There was a significant difference in the knowledge between hospital and camp patients regarding the effect of diabetes on vision.

Thus, camp patients were less aware than the hospital patients, that diabetes affects vision which was more than 37.1% as quoted by Rani PK et al<sup>5</sup> and 46.6% as quoted by Thapa R et al.<sup>6</sup> However the population studied by Rani PK et al was rural general population whereas the present study included only known diabetic individuals. Diabetic individuals are expected to be more aware regarding diabetic retinopathy as compared to non-diabetics.

When asked if DR is a complication of DM or not, among hospital patients 58.3% were aware of DR and among camp patients 18% were aware of DR. According to the Chennai urban rural epidemiology study<sup>7</sup>, only 19.0% (4951/26,001) of the total population and only 40.6% (621/1529) of diabetics were aware that DM could produce some complications. In another KAP study by Rani et al.<sup>9</sup> 966 (49.9%) individuals had knowledge about diabetes and 718 (37.1%) about diabetic retinopathy.

Nearly half of the population of both hospital patients and camp thought that regular eye check up was not required periodically. This was different from a study by Hussain et al.<sup>8</sup> which revealed that 75.3% (4378/6211) strongly felt that all patients with DM should undergo periodic eye check-ups irrespective of visual loss.

Source of information for DR in hospital patients for 50.16% was their general practitioners, for 42.9% patients it was ophthalmologist and optometrist for 6.5%. 0.32% of them claimed to have got information from family members, friends or relatives who suffered from diabetes. None of the patients obtained information from mass media such as television, radio, newspaper, magazines. In camp patients the source of information for 11.3% was their general practitioners, for 73.6% it was their ophthalmologist and for 4% patients it was optometrist. 10.3% of them claimed to have got information from eye check up camps held in their villages. 0.6% of them claimed to have got information from family members, friends or relatives who suffered from diabetes. Thus, media (magazines and radio) played no role in disseminating information in present study population, unlike in the study by Saikumar et al (2007)<sup>9</sup> where media was the main source for awareness. This finding emphasizes the need of better media coverage to spread the awareness about diabetes and diabetic retinopathy in our country.

In the present study literacy and duration of diabetes showed a significant association with levels of knowledge.

When asked if DR causes blindness or not, 51.79% answered yes, 48.21% said don't know among hospital patients. Among camp patients 20.3 % said yes, 5.6% said no and 74% said don't know. This was far less than the findings of Hussain et al<sup>8</sup> which showed that about 66.6% of the study population knew that diabetes could cause blindness.

98.3% patients among hospital patients said that they will go an ophthalmologist for eye check-up and 1.63% said will go to general practitioner. Among camp patients 72.6% said ophthalmologist, 4.3% said optometrist and 23% to a general practitioner.

When asked about treatment modalities of diabetic retinopathy, out of the hospital patients 40.7% patients had no knowledge regarding the treatment options available for diabetic retinopathy. 52.7% of the respondents were of the opinion that LASER could treat diabetic retinopathy. 2.9% of them were under the impression that only surgery was the treatment available for diabetic retinopathy and 3.5% believed that intravitreal injection treats DR. Out of the camp patients 89% patients had no knowledge regarding the treatment options available for diabetic retinopathy. 4% of the respondents were of the opinion that LASER could treat diabetic retinopathy. 3.6% of them were under the impression that only surgery was the treatment available for diabetic retinopathy and 3.3% believed that intravitreal injection treats DR. Thus, in the present study maximum patients in hospital group were aware of laser as treatment of diabetic retinopathy but camp patients were less aware about any treatment for DR.

When asked whether their eyes had a dilated fundus examination or not, among hospital patients 96.74% said yes and 3.26% said no. Among camp patients 70% said yes and 30% said no. **Namperumalsamy et al.**<sup>10</sup> observed that only 6.8% of the patients with DM had undergone dilated fundus evaluation before their screening project and only one-fourth of the screened population with retinopathy returned for examination at the hospital. This highlights the fact that despite good knowledge and attitude, insufficient motivation of the patients with DM for evaluation and follow-ups is a potential barrier to improve their practice patterns.

When a leading question like if eye examination is required in DM only if vision is affected, Among hospital patients 88.6% patients could afford the eye care facilities and 11.4% could not afford the eye care facilities. Among camp patients majority i.e. 93% could not afford the eye care facilities and only 7% said they could afford the eye care facilities. There was a significant difference in the affordability among both the groups. This was different from a study by **Hussain et al.**<sup>8</sup> which revealed that 75.3% (4378/6211) strongly felt that all patients with DM should undergo periodic eye check-ups irrespective of visual loss.

When they were put up with a statement like newly detected patients do not require eye check-up, 51.14% strongly disagreed, 39.2% were neutral about it and 0.6% agreed to it among the hospital patients. Among camp patients 2% strongly disagreed, 1% moderately disagreed, 48% were neutral about it, 7.6% moderately agreed and 41.3% strongly agreed. Thus, more number of patients disagreed and remaining were neutral in the hospital group whereas in camp group most of them were neutral and some of the disagreed. **Rani et al.**<sup>5</sup> in their study noted that 36.5% of individual with knowledge about diabetic retinopathy, replied that if their blood sugar is under control than there is no need to consult an ophthalmologist, compared with 55.5% with no knowledge, whereas in the study by **Hussain et al.**<sup>8</sup> 38.49% of patients believed that there is no need to visit ophthalmologist if a person is having diabetes under control.

When asked if blood sugar control is required to prevent DR, among hospital patients, 0.98% strongly disagreed, but maximum i.e. 31.6% strongly agreed 26.06% moderately agreed and 41.3% were neutral about it. Among camp patients 56.3% were neutral about it followed by 40% who moderately agreed, 2.3% strongly agreed, 1% moderately disagreed and 0.33% strongly disagreed. In the present study we also found that both hospital and camp patients got information about DR mainly from ophthalmologists when they come to them with ocular complaints. Some of them said that they got information about diabetic retinopathy from general practitioners. But the role of mass media in spreading awareness about DR was negligible. This

was far different from what was observed in a study in South India by Saikumar et al.<sup>9</sup> where those who were aware that

Among the known hospital diabetics 75.2% had good knowledge and 24.8% had poor knowledge, 50.16% had a positive attitude and 49.8% had negative attitude, 89.5% had good practice patterns and 10.4% had poor practice patterns. Although half of them followed general diabetic care, 61.8% hospital patients had undergone screening for retinopathy vis a vis 33.3% among camp patients had undergone screening for retinopathy.

Among the known camp diabetics 38.3% had good knowledge and 61.7% had poor knowledge, 13.3% had a positive attitude and 86.6% had negative attitude, 19.3% had good practice patterns and 80.6% had poor practice patterns. It was similar to the findings of **Rani et al.**<sup>5</sup> who found that 37.1% patients had good knowledge about diabetic retinopathy.

This was different as found in a study conducted in a South Indian state by **Hussain et al.**<sup>(99)</sup> in which among 6211 people. Among the known diabetics 40.7% had good knowledge, 53.8% had a positive attitude, and 57.6% had good practice patterns. Also, 61.8% of hospital patients and only 33.3% of camp patients were actually screened for diabetic retinopathy, which reflects insufficient motivation among camp patients with DM. **Namperumalsamy, Kaliaperumal et al.**<sup>10</sup> showed that although 80% of respondents from the community felt that yearly eye examinations were essential, only 43.5% had ever visited an ophthalmologist.

Although half of them followed general diabetic care, only 9.6% had undergone screening for retinopathy. In this study by **Hussain et al.**<sup>8</sup>, awareness of diabetic ocular complications was significantly higher among literate patients and with increased duration of diabetes. Sex of the patient did not significantly affect awareness.

Our survey population showed a significant association between literacy and good knowledge as well as a positive attitude in the hospital group and also the camp population, which is similar to the results of other population studies.<sup>11,5,12</sup>

The differences in level of awareness of diabetes in the hospital and camp patients could be attributed to differences in the education levels. In the present study, subjects with no formal education were found to have high unawareness rates compared with the educated group regarding diabetes, which is in agreement with previous studies<sup>17</sup>.

There was a statistically significant association between monthly income and knowledge on DR. Diabetic patients who had higher monthly income had better knowledge on diabetic retinopathy. This explains the higher level of education among the hospital patients as compared to the camp patients. **Rani PK et al.**<sup>5</sup> in a study done in India found that knowledge on diabetes and DR being significantly higher in those with upper socioeconomic status compared with extreme lower socio-economic. The higher knowledge on DR on those with higher monthly income could be explained by the fact that they are able to access hospital facilities and afford hospital care as compared to the patients with low monthly income. Another major finding of our study was the impact of knowledge of DR on attitude and practice. Comparison between the hospital and camp groups revealed statistically significant differences in terms of knowledge about DR, adopting the correct attitude and following proper practices related to DR.

## CONCLUSION

This KAP study showed difference in level of Knowledge, Attitude and Practices between hospital and camp patients and showed that hospital patients were better aware of diabetic retinopathy than camp patients.

Study emphasises the need to create awareness regarding diabetic retinopathy and to motivate them to improve their practices towards diabetic retinopathy. The level of education, economic status (monthly income) and duration of diabetes were the factors that were found to be significantly associated with knowledge, attitude and practice on diabetic retinopathy between the two groups and the total study population. Better literacy is means to better public awareness; however, the trend for poor practice patterns needs to be drastically changed with aggressive public motivation emphasizing the necessity of screening for retinopathy and periodic follow-ups.

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