

Original Research Article

Patterns and predictors of hearing help-seeking behaviour among older adults with hearing loss in a South Indian cohort

Sanjay Shankar*, Sandeep Maruthy

Department of Audiology, All India Institute of Speech and Hearing, Mysore, Karnataka, India

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*Correspondence:

Sanjay Shankar,

E-mail: ssanjay2511998@gmail.com

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ABSTRACT

Background: Hearing loss is highly prevalent among older adults and is associated with communication difficulties, social isolation, depression, and reduced quality of life. Despite these consequences, many individuals delay seeking professional hearing healthcare and hearing-aid adoption for several years. Hence, the study aimed to characterize the extent of help-seeking delay (HSD) among older adults with sensorineural hearing loss in this cohort and to investigate the demographic and audiological factors associated with help-seeking delay.

Methods: A retrospective, quantitative design was employed using a structured self-report form. The study included 250 participants aged ≥ 55 years, representing diverse demographic and audiological characteristics.

Results: On average, participants delayed 3.5 years from the onset of self-reported hearing difficulties before undergoing a hearing test. Help seeking interval was significantly associated with participants' age, with younger individuals in the cohort seeking help earlier compared to older counterparts. Socio-economic, rural residence, and hearing loss were significant predictors of delay, while gender and literacy were not. Help seeking interval was independently associated with increasing age and below-poverty-line income, but not with audiological severity or other demographic after adjustment.

Conclusions: Despite perceiving hearing difficulties, many older adults in South India, India delay seeking audiological care. The mean pure-tone average at first assessment corresponded to moderately-severe degree of hearing loss, suggesting that help-seeking occurs only when impairment becomes substantial. At this stage, individuals begin considering for hearing help; however, age and financial constraints remain a barrier to timely seeking help.

Keywords: Audiological diagnosis, Audiological rehabilitation, Hearing loss, Help-seeking delay

INTRODUCTION

Hearing loss is a major global public health concern, particularly among older adults, with approximately one-third of individuals aged 65 years and above experiencing disabling hearing loss, defined as a hearing threshold greater than 35 dB HL in the better-hearing ear.¹ The global demographic shift toward an aging population is expected to further increase this burden, with an estimated 1.2 billion people aged 60 years and older in 2025, including more than 500 million projected to experience clinically significant presbycusis.² The WHO

further projects that by 2050, nearly one in ten individuals worldwide will have disabling hearing loss, with approximately 80% residing in low- and middle-income countries where access to specialized hearing healthcare remains limited.¹

Untreated hearing loss has far-reaching consequences beyond communication difficulties, contributing to social isolation, depression, reduced self-esteem, impaired speech comprehension, reduced physical functioning and quality of life, and an increased risk of dementia.³⁻⁶ Despite these well-documented adverse outcomes, many

older adults do not seek timely professional help, and only a minority adopt and consistently use hearing aids, the primary intervention for age-related hearing loss.⁷ This gap between hearing healthcare needs and service utilization highlights the urgent need to promote awareness, help-seeking behaviour (HSB), and early identification and intervention for hearing loss among older adults.

A substantial body of research indicates that help-seeking for hearing loss is frequently delayed among older adults. Reported delays range from approximately 7 to 10 years, with an average delay of 8.9 years between self-perceived hearing aid candidacy and hearing aid adoption.⁸⁻¹⁰ Although recent MarkeTrak reports suggest a modest reduction in help-seeking delay from five years in 2019 to four years in 2022, help-seeking among older adults remains substantially delayed.¹¹ This persistent delay highlights the complex interplay of factors that influence hearing HSB. Increase in hearing loss severity, as measured by both pure-tone audiometry and self-reported disability, is consistently associated with an increased likelihood of seeking help.^{9,12,13} Individuals, who perceive themselves as vulnerable to hearing problems, anticipate benefits from hearing aids, recognize fewer barriers to rehabilitation, and experience communication difficulties are also more likely to seek professional care.^{14,15} Additionally, demographic and psychosocial characteristics influence HSB, with help-seekers more likely to be married, of higher socioeconomic status, and white, whereas non-help-seekers often demonstrate better speech recognition in challenging listening environments and report lower perceived hearing handicap.¹⁰ However, much of this evidence is derived from high-income settings and may not fully reflect the realities of low- and middle-income countries, where the majority of individuals with disabling hearing loss reside and where access to care is limited.¹

In the Indian context, these challenges are further intensified by structural and systemic barriers, including environmental noise, socioeconomic disparities, limited access to hearing healthcare services, and a shortage of audiology professionals concentrated in urban areas.¹⁶⁻¹⁸ Additionally, socio-cultural beliefs that normalize hearing loss as part of ageing further reduce perceived need for intervention.^{7,19} Although existing Indian studies have identified multiple factors influencing hearing help-seeking behaviour, much of the available evidence is either indirect or derived from caregiver perspectives in paediatric populations, leaving a critical gap in understanding adult help-seeking behaviour, particularly among older individuals with sensorineural hearing loss.²⁰

Therefore, despite the known burden of hearing loss and its consequences, there remains limited empirical evidence from India on the extent of help-seeking delay and its associated demographic and audiological determinants in older adults. Addressing this gap is essential to contextualize global findings within the

Indian healthcare setting and to inform targeted strategies for early identification, timely intervention, and improved access to hearing healthcare services.

Hence the present study was taken up with the objective to quantify the duration of hearing help-seeking delay and examine its association with demographic and audiological factors among older adults with sensorineural hearing loss in a South Indian cohort.

METHODS

A retrospective quantitative design was employed using a structured self-report form to examine help-seeking among a cohort of older adults with hearing loss belonging to South India. Data were collected using a structured data collection form. The research was conducted in accordance with institutional ethical standards and was approved by the Institutional Ethics Committee (Approval No. SH/IRB/M.1/14/2024-25, dated 27.12.2024).

The items included in the form were selected following a comprehensive review of the literature on factors influencing HSB among individuals with hearing loss.^{12,13,15,21-24} Previous studies have identified several determinants of help-seeking, including audiological factors (e.g., degree of hearing loss and speech recognition thresholds) and demographic characteristics (e.g., age, sex, educational level, place of residence, and socioeconomic status). Drawing on this evidence base, a data collection form was developed for the present study, with consideration given to its relevance and contextual applicability to the Indian population.

The form comprised 10 items addressing demographic variables such as age, gender, residential address, education, and annual income. Information regarding the referral pathway and findings of any previous consultation was also recorded. In addition, the age at which participants first noticed hearing difficulties and the time interval between first noticing the hearing difficulty and undergoing hearing assessment were documented. The help-seeking interval was subsequently calculated based on the reported age of onset of hearing difficulty and the age at first audiological assessment. Data were extracted retrospectively from participants' case records by the investigator (SS) and entered into the data collection form. Variables were recorded in either binary-response or open-ended formats. Open-ended responses were subsequently categorized into binary groups to facilitate statistical analysis. All the entries were verified by the second investigator (SM).

Data collection

Clinical records of 250 adults with sensorineural hearing loss were retrospectively reviewed. The persons had to be above 55 years, residing in a south Indian state, having bilateral sensorineural hearing loss and assessed for their

hearing only at the All India Institute of Speech and Hearing (AIISH), Mysuru. All of them were registered cases of the AIISH, for evaluation of hearing difficulties. AIISH is a premier institute and Centre of Excellence in hearing healthcare under the aegis of the Government of India. The institute provides comprehensive audiological services at subsidized rates and receives patients through multiple referral pathways, including self-referrals and referrals from healthcare professionals.

Only records of individuals who attended AIISH between October 1, 2024, and March 1, 2025, were considered for review. A consecutive sampling approach was employed; whereby clinical records were reviewed sequentially and all individuals meeting the predefined eligibility criteria were included. To ensure accurate estimation of the help-seeking interval, only individuals undergoing their first audiological evaluation were eligible for inclusion. Accordingly, individuals who had previously undergone audiological assessment at any other facility before attending AIISH were excluded. A total of 250 individuals satisfied the inclusion criteria and were included in the study.

The age of the 250 persons ranged between 55 and 84 years of age ($M=70.16$ years, $SD=6.83$). All of them had been evaluated by qualified audiologists and otolaryngologists following the standardized clinical assessment protocol implemented at AIISH. The evaluation included otoscopic examination, pure-tone audiometry, and immittance testing. Only individuals diagnosed with bilateral sensorineural hearing loss and exhibiting normal middle-ear function, as indicated by a type A tympanogram with normal gradient, were included in the study. Participants were eligible irrespective of the degree of hearing loss, and no minimum hearing-threshold criterion was applied.

Pure-tone audiometry had been performed in a sound-treated double room meeting ANSI S3.1-1999 (R2003) specifications using the modified Hughson-Westlake procedure. Air-conduction thresholds were obtained at octave frequencies from 0.25 to 8 kHz. PTA was calculated as the average of air-conduction thresholds at 0.5, 1, 2, and 4 kHz. SRT was defined as the lowest presentation level at which 50% of paired-words were correctly identified.

The PTA and SRT values were extracted from the participants' clinical records and included as audiological variables in the study. For participants with more than one audiological evaluation recorded in their case record, PTA and SRT values obtained during their first ever audiological assessment were used for analysis.

The self-reported age at onset of hearing difficulties and the age at first audiological assessment were also extracted from the individual case records. Hearing help-seeking interval (HSI) was calculated as the difference between the age at first audiological assessment and the

self-reported age at onset of hearing difficulties. Accordingly, higher HSI values would indicate a longer hearing help seeking delay.

Referral pathways were also extracted from the clinical records. Referral pathway data obtained from the clinical records indicated that 131 participants were self-referred, 52 were referred by a medical practitioner, 40 sought professional consultation following encouragement from friends, and 27 attended following encouragement from family members.

Statistical analysis

Data were analyzed using IBM SPSS statistics version 21. Descriptive statistics were computed for all demographic (except the name), audiological, and the HSI. To classify participants into early and late help-seeker groups in terms of HSI, a two-step cluster analysis was performed using a single continuous input variable. Cluster quality was evaluated using the average silhouette coefficient, and the optimal number of clusters was determined using Schwarz's Bayesian information criterion.

Binary logistic regression analyses were conducted to identify demographic and audiological factors that influence the hearing HSI, with unadjusted models estimated for each variable followed by multivariable adjusted models. Model fit was evaluated using the likelihood ratio chi-square test, along with Nagelkerke's R^2 and classification accuracy. Odds ratios with 95% confidence intervals were reported, and statistical significance was set at $p<0.05$. The adequacy of the sample size for binary logistic regression was evaluated using the events-per-variable criterion. With 127 participants in the late help-seeker group and seven predictor variables, the study achieved approximately 18 observations per predictor variable, exceeding the recommended minimum of 10.

RESULTS

The study sample was socioeconomically diverse and comprised participants from multiple regions of Karnataka, a southern Indian state with an estimated population of approximately 80 million. Table 1 presents the distribution of participants by age, gender, education, locality, and family income. Age was dichotomized into 55-70 years and 71-84 years using the sample median age (71 years) as the cut-off point. Educational attainment was classified as "advanced" (completed education beyond 10th standard/high school) or "below advanced" (completed up to 10th standard/high school or less) according to the International Standard Classification of Education (UNESCO, 2012). Income levels were grouped as "below poverty line (BPL)" or "above poverty line (APL)", using a threshold monthly income of ₹22,000 (US \$ 249). Locality was defined as "rural" or "urban" based on participants' residential addresses, in accordance with the Census of India classification (Registrar General

and Census Commissioner, India, 2011). Of the 250 participants, only 12 were employed, while the remaining individuals were retired, homemakers, or not working at present.

Table 1: Distribution of study participants by demographic characteristics (age, gender, education, locality, and income).

Demographic variables	Category	N	Percentage
Age (years)	55-70	120	48.0
	71-84	130	52.0
Gender	Male	145	58.0
	Female	105	42.0
Education	Below advanced	137	54.8
	Advanced	113	45.2
Locality	Rural	129	51.6
	Urban	121	48.4
Income	BPL	149	59.6
	APL	101	40.4

Table 2: Audiological characteristics of the study participants (n=250).

Variables	Mean (SD)
Age at onset of hearing difficulty (years)	65.30 (4.75)
Help-seeking interval (years)	3.49 (2.69)
PTA (dB HL)	55.71 (7.76)
SRT (dB HL)	60.02 (7.88)

Table 2 shows the mean (SD) of the audiological characteristics of the study participants. The mean self-reported age at onset of hearing difficulties was 65.30 years (SD=4.75). The HSI ranged from a month to 11 years with a mean HSI of 3.49 years (SD: 2.69) and median of 3.00 (IQR: 4.00). The mean PTA in the better ear was 55.71 dB HL (SD=7.76), and mean SRT of 60.02 dB HL (SD=7.88)..

Relationship of demographic and audiological factors with the hearing help-seeking interval

In order to study the relationship of hearing HSB with age, gender, education, locality, income, and audiological factors, participants were categorized into early and late help seekers based on their HSI. Two-step cluster analysis was performed using a single input variable, resulting in two distinct clusters with good clustering quality, as indicated by an average silhouette coefficient of 0.70. Schwarz's Bayesian information criterion was used to determine the optimal number of clusters. Table 3 shows the distribution of participants according to their hearing

HSI into early help-seeker group (help-seeking <3 years), comprising 123 participants (49.2%), and a late help-seeker group (help-seeking >3 years), consisting of 127 participants (50.8%), with a size ratio of 1.03. The mean help-seeking interval in early help-seeker group was 1.30 years (SD: 0.51), while it was 5.62 years (SD: 2.21) in late help-seeker group. Table 4 shows the distribution of early and late help-seekers across two groups of age, gender, education, locality, and income variables. PTA and SRT were analyzed as continuous audiological variables.

Table 3: Distribution of participants according to hearing help-seeking behavior.

Help-seeking group	Help-seeking interval	N (%)	Mean interval (SD)
Early help-seekers	<3 years	123 (49.2)	1.30 (0.51)
Late help-seekers	>3years	127 (50.8)	5.62 (2.21)

Binary logistic regression was performed to examine the ability of demographic and audiological variables to predict help-seeking. In the unadjusted analyses (Table 5) age, locality, income, PTA, and SRT were significantly associated with HSI, whereas gender and education were not. Higher age, rural residence, lower income, and higher degree of hearing loss were associated with a higher likelihood of delayed help-seeking.

All factors (age, gender, education, locality, income status, PTA, and SRT) were entered simultaneously (enter method), and adjusted odds ratios reflect the independent effect of each variable controlling for the others. The overall adjusted model (Table 5) based on the late help-seeker criterion was statistically significant ($\chi^2=125.12$, $p<0.001$), explained 52.5% of the variance in HSB (Nagelkerke $R^2=0.525$), and correctly classified 82.0% of participants as early or late help seekers. In the adjusted model, age and income emerged as significant independent predictors of delayed help-seeking. Compared to participants aged 55-70 years, those aged 71-84 years had 17.52 (CI: 8.71-35.24) times higher odds of being the late help-seekers. Participants from BPL households had 3.01 (CI: 1.08-8.37) times higher odds of being late help-seekers compared to those from APL households. In contrast, gender, education, locality, PTA, and SRT did not show statistically significant independent associations with HSI, suggesting that their effects were not conclusive after adjustment for other variables.

Table 4: Distribution of early and late help-seekers by demographic variables (age, gender, education, locality, and income).

Variables	Category	Early help-seekers 123 (49.2%)	Late help-seekers 127 (50.8%)
Age (years)	55-70	98 (79.7)	22 (17.3)
	71-84	25 (20.3)	105 (82.7)
Gender	Male	65 (52.8)	80 (63.0)
	Female	58 (47.2)	47 (37.0)
Education	Below advanced	63 (51.2)	74 (58.3)
	Advanced	60 (48.8)	53 (41.7)
Locality	Rural	56 (45.5)	73 (57.5)
	Urban	67 (54.5)	54 (42.5)
Income	BPL	61 (49.6)	88 (69.3)
	APL	62 (50.4)	39 (30.7)

Note: HSB duration of <3 years are early help-seekers and ≥ 3 years are late help-seekers.

Table 5: Unadjusted and adjusted odds ratios, confidence interval (CI), and p value of binary logistic regression analysis examining the associations of demographic and audiological factors with help-seeking interval.

Variables	Unadjusted			Adjusted		
	Odds ratio	95% CI (lower-upper)	P value	Odds ratio	95% CI (lower-upper)	P value
Age (years)	18.70	9.90-35.32	<0.001	17.52	8.71-35.24	<0.001
Gender	1.51	0.91-2.51	0.105	1.24	0.63-2.44	0.522
Education	1.33	0.80-2.19	0.263	1.10	0.44-2.32	0.981
Locality	1.61	0.98-2.66	0.049	1.24	0.45-3.40	0.672
Income	2.29	0.26-0.73	0.002	3.01	1.08-8.37	0.035
PTA	1.06	1.02-1.10	<0.001	0.98	0.89-1.09	0.815
SRT	1.08	1.04-1.12	<0.001	1.08	0.98-1.20	0.107

Additionally, a post-hoc power analysis was conducted using G*Power under the z tests family for logistic regression, with a two-tailed alpha level of .05 and a total sample size of 250. The event probability was set at 50.8% (127/250), corresponding to the proportion of late help-seekers in the sample. To provide a conservative estimate, the smallest statistically significant adjusted odds ratio observed in the model, income (OR=3.01, 95% CI: 1.08-8.37), was used as the effect size. Based on these parameters (OR=3.01, $\alpha=0.05$, N=250), the achieved statistical power ($1 - \beta$) exceeded 0.80, indicating that the study was adequately powered to detect significant associations in the logistic regression analysis.

DISCUSSION

This study aimed to examine the hearing help seeking among older adults with hearing loss in a cohort belonging to south India. Additionally, the study sought to identify key demographic and audiological factors that may influence the HSI.

Patterns of hearing help-seeking behaviour in older adults of a cohort belonging to Karnataka in south India

On average, participants waited approximately 3.49 years (range: same day to 11 years) after first noticing hearing difficulties before undergoing a diagnostic hearing

evaluation. Although these delays remain considerable, they are shorter than those reported in earlier studies in Western populations. For instance, previous studies have reported delays of 7-10 years among adults aged 50-90 years, while an average delay of approximately 10 years has been observed among individuals aged 55-74 years.^{8,25}

Several factors may explain the comparatively shorter delays observed. First, the study was conducted more than a decade after earlier investigations, during which awareness of hearing loss, listening demands, access to hearing healthcare, and social expectations may have evolved. Improved accessibility to hearing services itself may facilitate earlier help-seeking.²¹ Earlier estimates indicated only one audiologist per 950,000 population in India.²⁶ The audiology workforce subsequently has increased from an estimated 6,000-7,000 practising professionals in 2016 to approximately 16,162 practising audiology professionals in 2026 (as per Rehabilitation Council of India registration portal).¹⁸

Second, delayed recognition of hearing difficulties may influence the reported timing of onset. Reduced hearing health literacy may lead individuals to notice hearing problems only once they become functionally significant, thereby shifting the reported onset closer to the time of consultation.²⁷ Because the present study relied on participants' self-reported onset of hearing difficulties,

these reports likely reflect the stage at which communication problems became noticeable rather than the true biological onset of hearing loss, and may also be susceptible to recall bias.

Participants in this study also had, on average, moderately severe hearing loss, which may have increased their motivation to seek intervention due to greater communication difficulties.²⁸ The higher perceived hearing handicap associated with higher degree of hearing loss may have encouraged help-seeking behavior. This interpretation is further supported by the substantial proportion of self-referred participants (N=131), suggesting that many participants had recognized the impact of their hearing difficulties and independently sought professional intervention.

The study was conducted at the AIISH, Mysuru, a government institution that provides comprehensive audiological services at subsidized rates. AIISH has operated a dedicated hearing device dispensing unit since 2006, offering hearing aids and assistive devices at reduced cost.²⁹ The availability of affordable services and the institute's national reputation may have encouraged individuals to seek evaluation with the expectation of obtaining hearing aids. From a healthcare utilization perspective, the presence of accessible resources likely facilitates help-seeking.^{30,31}

Nearly half of the participants in the present study were self-referred, indicating relatively high personal awareness and proactive engagement with hearing health. Referrals from medical professionals accounted for 20% of cases, highlighting the role of healthcare providers in facilitating help-seeking, although such referrals may also reflect uncertainty among some individuals regarding where to seek care. Social influence was also evident: 18% of participants were advised by friends to undergo testing and 14% were brought in by family members. This shows that the communication partners frequently act as catalysts for audiological consultation.⁹

Influence of demographic and audiological variables on hearing help-seeking behaviour

The findings revealed a significant age-related difference in HSI, with individuals aged 71-80 years experiencing substantially longer delays than those aged 55-70 years. Age was significantly associated with help-seeking delay, with slightly higher likelihood of delaying diagnostic evaluation in the later age group. This pattern suggests that advancing age may be associated with greater normalization of hearing loss as part of aging, reduced perceived urgency for intervention, and increased physical or cognitive barriers to accessing care.^{9,14} In contrast, individuals in the younger segment of the cohort (closer to 55 years) may perceive hearing difficulties as more disruptive to daily communication and social interactions, thereby prompting earlier consultation.

Gender was not significantly associated with HSI, consistent with previous reports, suggesting that men and women in older age groups face similar barriers and facilitators to seeking audiological care.^{24,32} Similarly, education level was not associated with delays in help-seeking. However, literacy and awareness have been reported to facilitate help-seeking behavior.²¹

Locality showed a significant association with delays in the bivariate analysis but was not retained as a significant predictor in the multivariate model, indicating that the effect of rural residence may be mediated by factors such as income, service accessibility, and health literacy. In India, where a large proportion of individuals below the poverty line reside in rural areas, economic constraints may further limit the ability to afford transportation and repeated clinical visits.²¹ As an evidence to this, income level emerged as a significant predictor of delayed help-seeking. Participants classified as below the poverty line were nearly four times more likely to delay diagnostic evaluation than those above the poverty line. These findings highlight the impact of financial constraints on hearing help-seeking behavior. In the Indian context, where audiological services are not uniformly subsidized and insurance coverage is not available for the hearing health, affordability continues to be a major barrier to timely diagnosis of hearing loss.³³ Financial insecurity may lead individuals to prioritize other health concerns over hearing difficulties.

Participants in the present study generally sought audiological evaluation only after hearing loss had progressed to a moderately severe degree, suggesting a functional threshold at which professional help was pursued. The average self-reported age of onset of hearing difficulties was 65.3 years (range: 52-76 years), likely reflecting the stage at which hearing loss became functionally disabling rather than its true biological onset. Hearing loss may have begun earlier but remained unnoticed until it significantly interfered with daily communication. In the Indian context, higher environmental noise levels and relatively louder conversational speech may partially compensate for mild to moderate hearing loss, thereby delaying its recognition.

Unadjusted analyses indicated that poorer PTA and SRT scores were associated with delayed help-seeking, suggesting that individuals who postponed consultation tended to present with more advanced hearing loss. However, these associations were not significant in the multivariable model, indicating that age and income may play a more central role in delaying help-seeking than audiological severity alone. Collectively, these findings suggest that although worsening hearing may eventually prompt consultation, broader contextual factors substantially influence the timing of help-seeking.

Finally, although cross-cultural differences can influence HSI, cultural variability is unlikely to have affected the present findings. All participants were from the same

state (Karnataka), shared a common linguistic background (native Kannada speakers), and were broadly similar in cultural context.

Although this study provides important insights into the help seeking delay of older adults with hearing loss in a cohort of south India, few limitations should be acknowledged. The sample was drawn exclusively from a single tertiary centre AIISH, Mysuru. Although AIISH serves referrals from a wide geographic region, the findings may not fully generalize to individuals seeking services through private audiology clinics, district hospitals, or outreach programs with different service models. The study relied on self-reported timelines for onset, which may introduce recall bias. In addition, only a limited number of audiological variables were included, and key psychosocial factors such as stigma, perceived benefit, and family influence were not assessed.

CONCLUSION

The findings highlight clinically alarming delays in hearing help-seeking among older adults in India, with most individuals presenting only after progression to moderately severe hearing loss. Mean delay of 3.49 years was observed in the diagnostic evaluation. While greater audiological severity was associated with earlier diagnostic consultation, age and income emerged as the primary determinants of delays across both stages. Older adults and individuals from BPL households were significantly more likely to postpone diagnosis, underscoring the influence of financial constraints.

These results emphasize the need for earlier identification, including mild degrees of hearing loss. Strengthening routine screening for adults aged 60 years and above, expanding hearing health services, and reinforcing public initiatives through national programs such as the Rashtriya Vayoshri Yojana and the National Programme for Prevention and Control of Deafness are essential. Improving financial support and integrating hearing care into primary healthcare systems may further enhance timely help seeking.

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