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Knowledge Attitude and Utilization of Innuyir Kappom Thittam: Nammai Kakkum - 48 Scheme in Tertiary Care Hospital Chennai: A Cross-Sectional Study

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Abstract:
Background*: Road traffic accidents (RTAs) remain a major public health issue worldwide, with 1.35 million deaths annually. In India, Tamil Nadu reports one of the highest RTA fatality rates. To address this, the Government of Tamil Nadu launched the Innuyir Kappom Thittam: Nammai Kakkum - 48 (IK:NK-48) scheme in December 2021, providing cashless treatment for accident victims during the first 48 hours, the golden period for saving lives. So, the aim of the study was to assess the knowledge, attitude and utilization of the IK:NK-48 scheme among beneficiaries in a tertiary care hospital in Chennai.*
Materials and Methods*: A cross-sectional study was conducted among 200 beneficiaries aged ≥ 18 years using purposive sampling. Data were collected via a semi-structured, interviewer-administered questionnaire covering demographics, knowledge, accident details, utilization, and attitudes. Statistical analysis was performed using descriptive and inferential methods using JASP Software.*
Results*: Demographics: Mean age 41.3 years; majority male (81.5%), married (68.5%), urban residents (57.5%), and from lower socioeconomic groups. Knowledge: Only 17% had desirable knowledge; 90% had not heard of the scheme before hospital admission. Utilization: 83.5% received immediate treatment; 77% reported easy hospital accessibility. Transfers occurred in 24.5% of cases, mainly for specialized care. Attitudes: 60% rated services as "Good," 22% as "Excellent," and all participants recommended the scheme. Recovery: Non-critical injuries recovered faster ($p<0.010$). Alcohol intake was significantly associated with loss-of-control accidents ($p<0.001$). Suggestions: 60% emphasized the need for greater community-level awareness. Despite high satisfaction and effective utilization, awareness of the scheme was critically low across all demographic groups, including educated participants. The findings highlight the importance of targeted outreach, improved hospital administration, and standardized emergency protocols.*
Conclusion: *The IK:NK-48 scheme demonstrates strong potential in reducing RTA mortality and financial burden, with high beneficiary satisfaction. However, significant gaps in public awareness and procedural consistency must be addressed through community-level campaigns and system improvements to maximize impact and align with Sustainable Development Goal 3.6.*

Key Word*: Emergency Health Care, Innuyir Kappom Thittam: Nammai Kakkum - 48, Knowledge, Utilization, Public Health Awareness, Road Traffic Accidents (RTA), Trauma Care.*

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I. Introduction

The number of road traffic deaths on the world's roads remains unacceptably high with 1.35 million dying each year. Road traffic injuries are the 8th leading cause of death for people of all ages. And also road traffic injuries are now the leading cause of death for children and young adults aged 5 - 29 years. More than half of global road traffic deaths are amongst pedestrians, cyclists and motorcyclists who are still too often neglected in road traffic system design in many countries[1]. SDG 3.6's target is to reduce 50% of road traffic deaths by 2030[2]. Traditionally, India depends upon indirect reporting systems to estimate the burden of RTAs and its outcome. Reports published by the National Crime Records Bureau (NCRB) and the Ministry of Road Transport and Highways (MoRTH) are an important source of such information. As per the NCRB report 2022 (17,884), Tamil

Nadu reported more RTA fatalities in 2021 (15,384) than in the previous three years, while Chennai topped (3,653) in RTAs major city among the metropolitan cities[3].

Considering the burden of RTA and the unexpected, burdensome out-of-pocket expenditure to the family, Government of Tamil Nadu launched a pioneering scheme "Innuyir Kappom Thittam: Nammai kakkum - 48" (IK: NK-48) by the Hon'ble Chief Minister of Tamil Nadu on 18.12.2021, to address the increasing death rate due to Road Traffic Accidents (RTAs) and to save the life of RTA victims within Tamil Nadu during the crucial first 48 hours of accident which is the golden period for saving lives. This is to ensure reduction of financial burden on the family of Road crash victims in the first 48 hours critical period. This programme aims to further reduce delays due to denial of treatment and multiple Inter facility transfers, thereby reducing mortality and mobility to a great extent[4]**.**

Objectives of the Scheme

683 hospitals (448 private hospitals and 235 Government hospitals) have been empanelled in accident prone stretches based on the 500 accidents grid and taking into account the time of transport from accident site to the nearest medical facility. 81 designated treatment modalities / procedures for damage 340 control measures costing upto Rs. 2.00 lakh[5] per individual has been extended on a cashless basis on assurance mode to all victims of accidents occurring within Tamil Nadu, irrespective of nativity or nationality and whether they possess a Chief Minister's Comprehensive Health Insurance Scheme (CMCHIS) card or not. The scheme includes all victims of RTA, who belong to Tamil Nadu, other states, migrants and foreigners, within the boundaries of Tamil Nadu[4]. 18.12.2021 to 31.03.2023, 1,53,091 persons have been benefited under the scheme with the approved amount of Rs.135.01 crore. Out of this 1,39,011 persons have been admitted in Government hospitals for insurance coverage for Rs.111.63 crore[6].

Operational Guidelines of the Scheme:

Inclusion Criteria:

1. Accident Victims brought by Good Samaritans
2. Accident victims brought by family
3. Accident victims who come by themselves
4. Unknown accident victim brought by Police
5. Mass casualty accident victims

Exclusion Criteria:

1. Assault Injuries
2. Domestic Injuries
3. Fall from height
4. Injuries due to fall of heavy object
5. Train traffic accident injuries
6. Animal bites
7. Self harm
8. Occupational workplace Injuries
9. Thermal/Chemical/Burn Injuries
10. Cracker Blast Injuries

Treatment after 48 hours:

1. Accident victims can take treatment in the first 48 hours on a cashless basis on approved procedures in the empanelled hospitals.

2. If the victim continues to be unstable after 48 hours of treatment, treatment is continued free of cost in a government hospital. If the victim was admitted in an empanelled private hospital, he or she will be treated as per the following guidelines:

    a. If the victim is a beneficiary of the Chief Minister's Comprehensive Health Insurance Scheme (CMCHIS), the treatment has to be continued as per the existing package.
    b. If the victim is not a beneficiary of the CMCHIS, the patient is stabilized and then transferred to a nearby government hospital.

c. If the victim is not willing to go to a government hospital and is willing to take treatment in the private hospital with payment/under private insurance scheme, the patient will be stabilized and treated in the same hospital or transferred to the hospital of the patient's choice. Such patients pay the hospital fees from their own resources[4].

So, the aim of this study was to evaluate the knowledge, attitude and utilization of the "Innuyir Kappom Thittam: Nammai kakkum - 48" (IK: NK-48) scheme.

II. Material And Methods

This cross-sectional study was conducted at Tertiary Care Hospital, Chennai, among beneficiaries of the Innuyir Kappom: Nammai Kakkum - 48 (IK:NK - 48) scheme aged 18 years and above, using purposive sampling over a one-year period. The sample size was calculated using the formula ($4PQ/d^2$) with an anticipated utilization proportion of 7%, yielding 162.7, which was increased by 10% to account for non-response, resulting in a minimum of 200 participants. A semi-structured interviewer-administered questionnaire, validated by experts in epidemiology and emergency medicine, was used to collect data across five domains: demographic details, knowledge of the scheme, road traffic accident information, utilization of the scheme, and attitudes toward the scheme. Data collection was carried out over three months, with face-to-face interviews in Chennai, Thiruvallur and Kancheepuram districts, following informed consent and explanation of study objectives. Data entry was performed using ODK Collect via ona.io and analyzed in JASP software, employing descriptive statistics for demographic, categorical variables and inferential statistics to generalize findings. Knowledge scores were computed by assigning 1 for correct responses and 0 for incorrect responses, with scores above 50% classified as desirable knowledge. Ethical clearance was obtained from the Institutional Ethics Committee and confidentiality of participants was strictly maintained.

III. Result

A total of 200 Utilised population of the Innuyir Kappom Thittam: Nammai Kakkum - 48 (IK: NK - 48) Scheme from Chennai district was included in this study. The mean age of the study participants was **41.326 ± 15.440.**

Fig 1: Gender Distribution

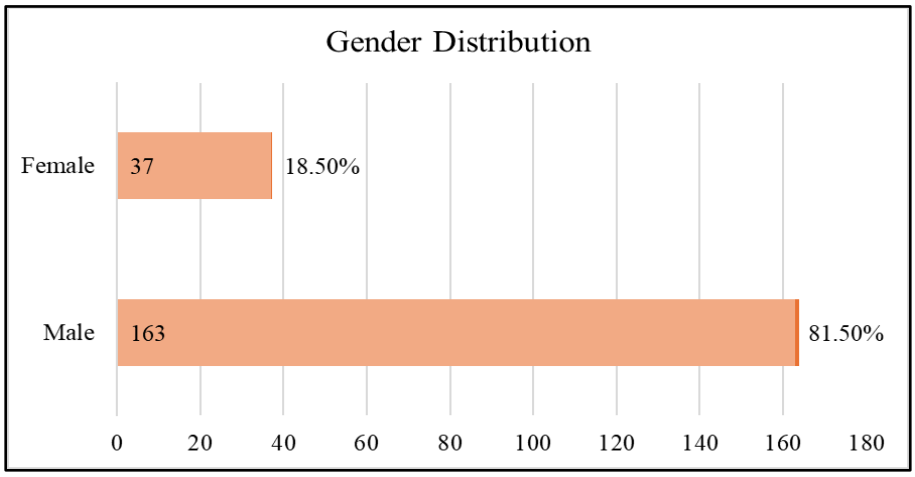

Table 1: Distribution of Socio-demographic variables

Variable	Category	Frequency (n)	%
Patient/Attender	Patient	70	35
	Attender	130	**65**

Age (in years)	18 to 29	54	**27**
	30 to 40	46	23
	41 to 53	50	25
	54 to 84	50	25
Marital Status	Married	137	**68.5**
	Unmarried	37	18.5
	Divorced	15	7.5
	Widowed	11	5.5
Residential Area	Urban	115	**57.5**
	Semi-urban	63	31.5
	Rural	22	11
Type of Family	Nuclear Family	184	**92**
	Joint Family	16	8
How many members in your family?	1 to 4	148	**74**
	5 to 9	32	26

Table 2: Distribution of Socioeconomic Status

Variable	Category	Frequency (n)	%
Socioeconomic Status	Upper Middle	45	22.5
	Lower Middle	67	33.5
	Upper Lower	81	**40.5**
	Lower	7	3.5

Table 3: Level of awareness about the scheme

Variable	Category	Frequency (N)	%	95% CI For Proportion	
				Lower	Upper
Knowledge	<50%	166	**83**	0.771	0.879
	≥50%	34	17	0.121	0.229

Table 4: Distribution of Road Traffic Accident Information of the Participants

Questions	Category	Frequency (n)	%
Location of the Accident	Chennai	154	**77**
	Thiruvallur	40	20
	Kancheepuram	6	3
How did the accident happen?	Collision with another vehicle	117	**58.5**
	Lost control of the vehicle	36	18
	Poor road conditions	5	2
	Pedestrian or animal crossing	27	13.5
	Mechanical failure	1	0.5
	Others	14	7
Type of Injury	Non-Critical	177	**88.5**
	Critical	23	11.5
Who assisted in admitting you to the hospital?	Friends/Family	75	37.5
	Good Samaritans (Public)	114	**57**

	Police	8	4
	Ambulance staff	3	1.5
How did you reach the hospital?	Ambulance	167	**83.5**
	Private vehicle	18	9
	Public transport	8	4
	Other modes of transport	7	3.5
If you used an ambulance, how long did it take for the ambulance to arrive at the accident location?	Less than 10 minutes	77	**46**
	10-20 minutes	70	42
	20-30 minutes	17	10
	More than 30 minutes	3	2
If you used an ambulance, how long did it take to reach the hospital?	Less than 10 minutes	17	10
	10-20 minutes	66	40
	20-30 minutes	71	**42**
	More than 30 minutes	13	8

Fig 2: Alcohol intake at the time of Accident

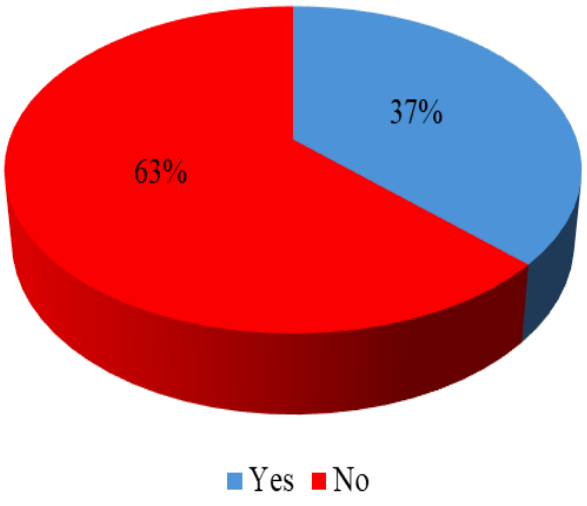

Table 5: Association Between Alcohol Intake and Reasons for Accident

Variable	Category	Alcohol Intake (N=35/200)		Total (n)	%	p-value
		Yes (n)	No (n)			
Reasons for Accident	Collision with another vehicle	2	18	20	57	**0.001**
	Lost control of the vehicle	11	-	11	**31**	
	Poor road conditions	-	1	1	2	
	Pedestrian or animal crossing	-	3	3	8	

Table 6: Distribution of Utilization of the Scheme

Questions	Category	Frequency (n)	%
Were you transferred from another hospital?	Yes	49	24.5
	No	151	**75.5**
If yes, what was the reason for the transfer?	Need for specialized treatment	27	**55**
	Lack of necessary medical equipment	7	15
	Doctor’s recommendation	4	8
	Better facilities at the hospital	6	12
	Insurance or financial reasons	5	10
Are the designated hospitals easily accessible from your location?	Yes	154	**77**
	No	46	46
Did they start treatment immediately?	Yes	167	**83.5**
	No	33	16.5

If not, what was the reason?	Police case procedures	1	3
	Hospital administration did not respond	12	36
	Lack of adequate resources	17	**52**
	Advised to transfer to another hospital	3	9
How long did it take you to recover from the accident?	Days	38	19
	Month	131	**65.5**
	Not recovered	31	15.5

Table 7: Association between Type of Injury and Recovery of the participants from the accident

Variable	Category	Type of Injury		Total (n)	%	p-value
		Non-Critical (n)	Critical (n)			
Recovery	Days	37	1	38	19	0.010
	Month	117	14	131	**65.5**	
	Not recovered	23	8	31	15.5	

Table 8: Distribution of Attitude towards the Scheme

Questions	Category	Frequency (n)	%
How would you rate the quality of healthcare services received through this Scheme?	Excellent	44	22
	Good	120	**60**
	Average	21	10.5
	Poor	15	7.5
What improvements would you suggest for better	Raise awareness about the scheme to the community	120	**60**

implementation of the scheme?	Improve accessibility to the scheme	9	4.5
	Enhance hospital administration efficiency	11	5.5
	Increase resources for the scheme	4	2
	Provide better training for medical staff involved in the scheme	9	4.5
	No Suggestions	47	23.5

IV. Discussion

This study focused on beneficiaries of the Innuyir Kappom Thittam: Nammai Kakkum - 48 (IK: NK - 48) scheme at a tertiary care hospital in Chennai. It contributes to the literature as one of the first studies examining beneficiary's awareness and experience with the scheme in Tamil Nadu. There are no prior studies that evaluate knowledge, attitude and utilization of the scheme. The results reveal significant gaps in knowledge dissemination, moderate usage patterns, and generally positive attitudes towards the scheme's implementation and benefits. Despite the IK:NK-48 scheme being part of the Chief Minister's Comprehensive Health Insurance Scheme (CMCHIS), beneficiaries showed low knowledge levels. Only 7.5% of participants were aware of the scheme, while just 17% displayed a satisfactory level of understanding. Nearly half of the respondents did not know which hospitals were eligible or the amount of financial coverage provided by the scheme. Additionally, 62.5% could not estimate the cost cap, and over 90% had never heard of the scheme before their hospital visit. This lack of knowledge extended across most demographic groups, including those with formal education, which did not significantly influence awareness levels (*p-value* 0.967). Interestingly, a notable portion of participants with graduate or postgraduate education still had a limited understanding, showing that literacy alone does not guarantee comprehension of the scheme.

On the other hand, attitudes towards the scheme were largely positive. Sixty percent of respondents rated their experiences with healthcare services received through IK:NK-48 as "Good," while 22% rated it as "Excellent." Remarkably, every participant expressed a willingness to recommend the scheme to others, indicating strong support from beneficiaries who interacted with the system. This contradiction of low knowledge but high satisfaction suggests that the quality of service delivery at tertiary care centers may enhance perceptions, regardless of prior awareness. However, the main suggestion for improvement, mentioned by 60% of respondents, was to boost community-level awareness, pointing to a recognized outreach deficiency. Other suggestions, though less frequently mentioned, included better hospital administration, improved accessibility, increased resources, and enhanced staff training, all of which support overall system improvement.

Utilization of the scheme showed positive trends, with 83.5% of participants confirming that treatment began immediately upon their arrival at the hospital. Moreover, 77% of beneficiaries found the empanelled hospitals to be easily accessible. However, the 23% who did not receive timely care reported significant barriers, such as lack of resources (52%) and administrative unresponsiveness (36%). These results highlight inconsistencies in emergency response procedures and emphasize the need for standardized operational protocols within hospitals. Transfers between facilities occurred in 24.5% of cases, mainly due to the need for specialized care or lack of necessary medical equipment. While these referrals may be clinically justified, they could delay critical interventions in trauma cases. A key finding was the significant connection between injury type and recovery outcomes (*p-value* 0.010). Patients with non-critical injuries typically recovered within days to a month, while those with critical injuries showed delayed or incomplete recovery, with 8 out of 23 critical cases remaining unresolved at the time of assessment. This underscores the necessity of accurate triage, trauma readiness, and streamlined referral pathways within the IK:NK-48 network.

The context of road traffic accidents added further depth to the analysis. Most incidents occurred within Chennai (77%), reflecting the city's heavy traffic and accident risk. Collisions with other vehicles were the most common cause (58.5%), followed by loss of control (18%), pedestrian or animal crossings (13.5%), and poor road conditions. Alcohol was significantly linked to specific types of accidents (*p-value* 0.001). Among participants who reported drinking, 31% were involved in accidents due to loss of control. This highlights an urgent need for more aggressive public education regarding alcohol-impaired driving, especially since 18% of the study population reported substance use. Moreover, Good Samaritans helped 57% of victims get to the hospital, far exceeding the responses from police and ambulance staff. This civic involvement should receive systemic recognition and support, possibly through first responder training or incentive-based participation to enhance early-stage trauma care. Demographically, participants were mostly male (81.5%), married (68.5%), urban dwelling (57.5%), and employed in elementary or skilled labor jobs (61.5%). The socioeconomic profile, based on the modified Kuppuswamy scale, indicated a concentration in the upper lower class (40.5%) and lower middle class (33.5%), aligning with the income-based targeting of the CMCHIS. Nevertheless, knowledge gaps persisted across these groups, showing that simply offering the scheme does not ensure health literacy. Proactive information sharing must be integrated into both pre-hospital and hospital processes. Given the scheme's focus on emergency road traffic accident cases, awareness campaigns could be strategically placed in transport hubs, driver license centers, auto workshops, and other places where high-risk groups are frequently present.

In summary, this study highlights both the strengths and weaknesses of the IK:NK 48 scheme in tertiary care settings. While the scheme shows notable success in patient satisfaction and timely treatment, it faces significant challenges in public awareness and procedural consistency. These insights underline the scheme's potential and the need for greater integration of health literacy efforts within emergency response frameworks. An informed public, supported by responsive institutions, can enhance the reach and impact of IK:NK-48 throughout Tamil Nadu. Future research could include beneficiaries from diverse government hospitals across Tamil Nadu for broader insights. Combining quantitative surveys with qualitative interviews would deepen insights into lived experiences and systemic barriers. Could follow-up studies every few years to track changes in knowledge attitude and utilization over time.

V. Conclusion

This study stands as the evaluation of Innuyir Kappom Thittam: Nammai Kakkum - 48 (IK:NK-48) Scheme, providing insights into its implementation, beneficiary experience, and public awareness gaps. Conducted in a tertiary care hospital in Chennai, the study examined how accident victims engaged with this emergency health initiative during incidents among scheme beneficiaries. The analysis highlights a significant gap between how often the scheme is used and how much beneficiaries know about it. We found that knowledge of the scheme was quite low; this signals a need for targeted public health education and awareness campaigns. The study showed a strong usage rate and high satisfaction levels with the quality of emergency care provided. However, participants often lacked clarity on essential details like financial coverage, eligibility criteria, and the hospitals involved, even after receiving services. By pinpointing this gap, the study sets the stage for creating targeted interventions that can connect public knowledge with institutional delivery, ensuring Tamil Nadu's emergency health policies reach their full potential. The insights from this evaluation provide a solid foundation for future interventions and policy reviews. They support improving outreach efforts and health equity while also providing a framework to enhance scheme visibility, improve implementation, and strengthen Tamil Nadu's trauma care system. As Tamil Nadu works towards its public health goals, including the global target to halve road traffic deaths under Sustainable Development Goal 3.6, this research is crucial for guiding equitable, responsive, and life-saving policy choices.

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