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Android Application for Community-Based Epidemiology Survey

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Abstract: "Android Application for Community-Based Epidemiology Survey" is developed using Android to facilitate data collection and analysis in epidemiological studies. Epidemiology involves the study of the distribution and determinants of health-related states or events within specific populations, applying this knowledge to control health problems. It is a scientific approach to understanding disease patterns in human populations and the impact of various factors on public health. The study integrates multiple disciplines, including physicians, biologists, public health experts, health educators, data analysts, and social scientists, promoting a holistic understanding of health trends. The Android application enhances the efficiency of data gathering through mobile devices, ensuring faster reporting, geo-tagged data collection, real-time analysis, and improved accessibility even in remote areas. This approach supports disease surveillance, early outbreak detection, health resource planning, and community health assessments, contributing to better public health strategies and evidence-based decision making.

Keywords: Epidemiology, Public Health, Survey, Data Collection, Interview.

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INTRODUCTION

The survey teams carried out a house-to-house survey. Information regarding the socio-demographic characteristics, lifestyle practices, morbidity conditions with specific reference to oral cancer, cervical cancer, breast cancer, skin cancer and cancer of the thyroid gland, leukemia, congenital anomalies, cataracts, any long-term illnesses, etc., were documented by the survey teams in the duly pre-tested performance of the household to identify the specific morbidity conditions. Gynecologists will be taking pap smear tests during further clinical survey [1].

This is a survey and a research medical study. We are trying to determine what percentage of the population has a certain skin condition. The information you provide here will remain completely confidential. We don't ask you to provide your name or any information that may identify you. To complete this survey, you must be at least 18 years old. Parents can respond on behalf of their children who are not yet 18 years of age. The name of this condition will be disclosed to you once you sign this brief consent form. The reason is that the name of the condition is withheld to avoid introducing bias in this study. We do not have accurate data about this skin condition. We don't know how common this condition may be in various ethnic groups. Your answers will help us determine how common or uncommon this condition is. For the integrity of scientific research and the data that we collect, it is essential to conduct this survey for everyone. This will help us to have an accurate assessment of this condition [2].

It should be noted that there is no foolproof methodology that will provide an accurate depiction of all people in a population that consumes fish. This is due, in part, to the inherent variability in fish-consuming populations and, in part, to the inability of any survey (methodology) to achieve unbiased sampling due to various factors. Therefore, it is essential to acknowledge the limits of the estimations generated when considering outcomes of fish consumption surveysand it is equally important to exercise prudence and discretion in making generalizations or assumptions about study results and their validity [3].

OBJECTIVE

The main objective of this project is to reduce data collection time and minimize missing data in community-based epidemiology surveys. The Android application ensures real-time data entry, validations, and error checks, helping to capture missing or incomplete information on the spot. It supports offline data collection, allowing users to gather data even in

remote areas without an internet connection, and syncing the data once connectivity is restored. Each patient can manually record their details [4].

Advantages of Android App

Today, the world is rapidly shifting towards mobility, and smart phones have become an essential part of our daily lives. According to surveys, more than two-thirds of Americans owned smartphones as early as 2013, and this number has only grown. Smart phones are increasingly seen as replacements for computers and laptops due to their portability and powerful capabilities. A key factor influencing smart phone usability is the operating system (OS) and the applications it supports. The four dominant mobile operating systems are iOS, Android, Windows, and BlackBerry, with Android and iOS commanding over 92% of the global smart phone market share [1].

Android holds an edge due to its open-source nature, allowing manufacturers and developers to customize it for a variety of devices, from budget phones to flagship models. This flexibility fuels wider accessibility, cost-effectiveness, and rapid innovation. Additionally, Android supports the Google Play Store, home to millions of apps, ranging from entertainment to healthcare and business solutions, making it versatile for personal and professional use. Other advantages include multi-tasking capabilities, seamless cloud integration with Google services, regular security updates, offline functionality, and support for third-party apps offering users freedom and customization. The global developer community also ensures continuous growth and frequent updates, enhancing the user experience overtime [5].

SURVEY LOCATIONS:

Table 1: Tirunelveli Sites

SL. No	Panchayat Union	No. of Village	Total Population	Total Male	Total Female	Total SC	SC Male	SC Female	Total ST	ST Male	ST Female
1	Palayamkottai	30	1,04,327	51,822	52,505	26,795	13,315	13,480	479	234	245
2	Manur	41	1,31,858	65,075	66,783	39,509	19,371	20,138	145	68	77
3	Melaneelithanallur	25	95,104	47,038	48,066	15,206	7,492	7,714	24	11	13
4	Kuruvikulam	43	1,08,866	53,272	55,594	38,521	18,812	19,709	91	41	50
5	Sankarankoil	28	1,02,406	50,780	51,626	31,145	15,332	15,813	156	84	72
6	Ambasamudram	12	52,829	26,143	26,686	10,000	4,789	5,211	85	38	47
7	Cheranmahadevi	12	35,262	17,564	17,698	7,996	3,940	4,056	281	139	142
8	Pappakudi	15	68,343	33,684	34,659	10,692	5,288	5,404	188	105	83
9	Kadayam	23	1,01,324	49,949	51,375	17,095	8,416	8,679	146	73	73
10	Nanguneri	27	95,039	46,694	48,395	17,896	8,760	9,136	188	98	90
11	Kalakadu	17	54,431	26,792	27,639	7,960	3,858	4,102	74	40	34
12	Valliyur	18	1,11,637	55,068	56,569	15,424	7,572	7,852	328	162	166
13	Radhapuram	27	1,10,001	54,183	55,818	16,352	7,982	8,370	1,353	683	670
14	Alangulam	28	1,09,980	53,911	56,069	17,342	8,386	8,956	42	25	17
15	Keezhapavur	21	1,29,281	64,317	64,964	12,749	6,293	6,456	49	26	23
16	Kadayanallur	16	77,482	38,611	38,871	21,940	10,859	11,081	111	51	60
17	Shenkottai	6	26,710	13,344	13,366	10,553	5,290	5,263	240	125	115
18	Tenkasi	14	58,081	29,077	29,004	16,711	8,333	8,378	11	7	4
19	Vasudevanallur	22	72,498	35,269	37,229	24,601	11,827	12,774	108	53	55
	Grand Total	425	16,45,509	8,12,593	8,32,916	3,58,487	1,75,915	1,82,572	4,099	2,063	2,036

METHODOLOGY:

The survey was conducted using a formal questionnaire through face-to-face interviews with consumers at key locations to ensure a diverse and representative sample. The questionnaire was designed to collect both quantitative and qualitative data, focusing on demographics, behaviors, preferences, and opinions.

Interviewers were trained to maintain consistency in questioning and minimize bias, ensuring reliable and accurate responses. The survey locations were strategically chosen based on foot traffic, demographic diversity, and relevance to the target population, including marketplaces, public transportation hubs, and community centers [6].

Questionnaire Design Process:

The questions are designed specifically for an Android-based application survey. The questionnaire was carefully developed, drawing from previous consumer surveys conducted in Kayalpattinam and other regions, ensuring relevance and reliability. It was reviewed and refined by FAO experts in Fisheries and Marketing to ensure accuracy, clarity, and cultural appropriateness before finalization.

The survey included a mix of open-ended and closed questions to capture both qualitative and quantitative insights. Open-ended questions offered rich, exploratory data by allowing respondents to freely express their ideas, experiences, and suggestions in detail.

Meanwhile, closed questions included Likert scale items to quantify attitudes, preferences, and satisfaction levels, making it easier to analyze trends and compare responses statistically.

Additionally, multiple-choice and ranking questions were included to streamline data collection and reduce response fatigue. The Android app allowed for dynamic question paths, where the next question could adapt based on previous answers, keeping the survey engaging and personalized for respondents. Built-in validations helped prevent incomplete submissions and ensure data accuracy in real time [2-7].

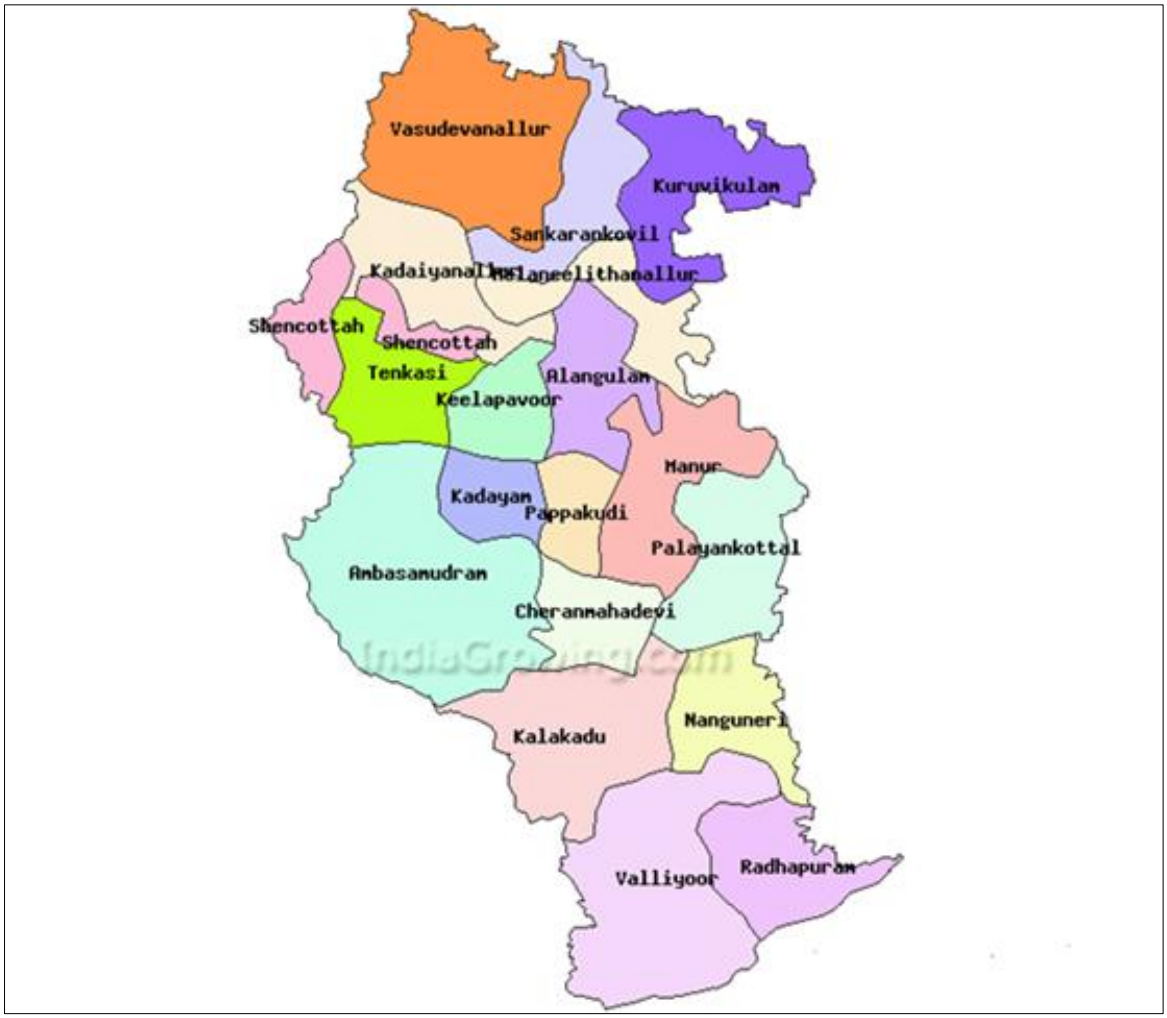

Figure 1: Tirunelveli Survey Site locations

Locations and Selection Process

Nineteen regions surrounding Tirunelveli were selected to ensure a diverse and comprehensive data collection. The selection process considered geographical coverage, population density, and economic diversity to capture a balanced representation of consumer behavior.

Face-to-face interviews were conducted at key locations such as supermarkets, local markets, fish landing sites, and fish shops, where a variety of consumers, from households to commercial buyers, frequently visit. These locations were chosen strategically to cover urban, semi-urban, and rural areas, ensuring the survey reflects different purchasing behaviors and socioeconomic backgrounds. The timing of interviews was also planned to coincide with peak hours to maximize engagement and ensure responses from active shoppers and vendors, enhancing the relevance and reliability of the data collected [8, 9].

Data Collection

Face-to-face interviews, using the questionnaire, were carried out for this survey. Initially, respondents were

briefed on the purpose of the interview and assured of confidentiality to build trust and encourage honest responses. The open-ended questions were asked in a probing yet unbiased manner to motivate respondents to share their genuine opinions and experiences. Interviewers were trained to maintain a neutral tone and adapt their approach based on respondent engagement, ensuring the conversation remained comfortable and productive. Efforts were made to clarify any doubts the respondents had about the questions to avoid misinterpretation.

The biggest constraint encountered during the survey was the time limitation for consumers, especially in busy locations like markets and shops. To address this, the questionnaire was optimized for brevity without compromising on data quality, and interviewers focused on high-traffic periods when respondents were more likely to engage. Additionally, follow-up interviews were considered for those who couldn't complete the survey on the spot, ensuring data completeness [10, 11].

Data Analysis

The data collected were evaluated using the Statistical Package for Social Sciences (SPSS) Version 17.0 and Microsoft Excel 2007 for efficient analysis and visualization. All questionnaires were carefully coded to protect respondent identities, ensuring confidentiality and ethical compliance throughout the study. The data underwent cleaning and validation to identify and rectify errors such as incomplete responses or inconsistencies, ensuring accuracy before analysis. Descriptive statistics, including mean, median, and standard deviation, were used to summarize the data, while cross-tabulations helped compare responses across different demographics and locations.

The outputs were presented through various visual formats, such as bar charts, pie charts, frequency distribution tables, and line graphs, to enhance clarity and aid interpretation. Trend analysis was also performed to identify patterns, offering valuable insights into consumer behavior and market dynamics [12].

RESULT

The results focus on fish consumption per capita, purchasing behavior, product preferences, and consumer knowledge about the nutritional benefits of fish and fishery products. It examines hygiene practices and key factors like handling, storage, and conservation that influence fish quality. Attitudes toward fish consumption, including taste preferences, frequency, price sensitivity, and willingness to try new products, were analyzed. The results provide demographic insights (age, gender, income, education, location) to identify market patterns. Factors like freshness, availability, price variations, sourcing preferences (local vs. imported), and seasonal trends were explored. The findings also assess consumer awareness of sustainable fishing and environmental impacts, offering valuable insights into market behavior and future demand [6-10].

Fish Consumption in Tirunelveli

Figure 2 shows that 95 percent of the respondents (n=1000) buy or consume fish/fishery products.

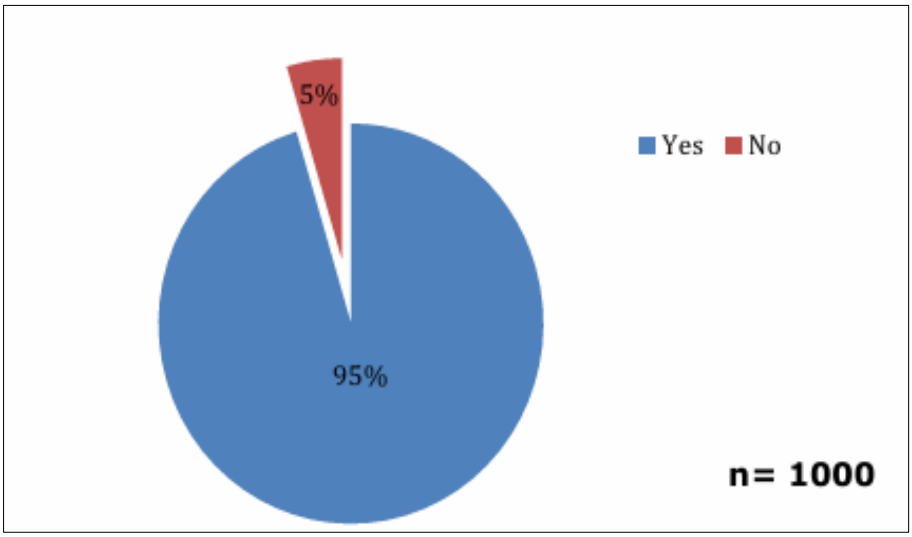

Figure 2: Fish purchase and consumption:

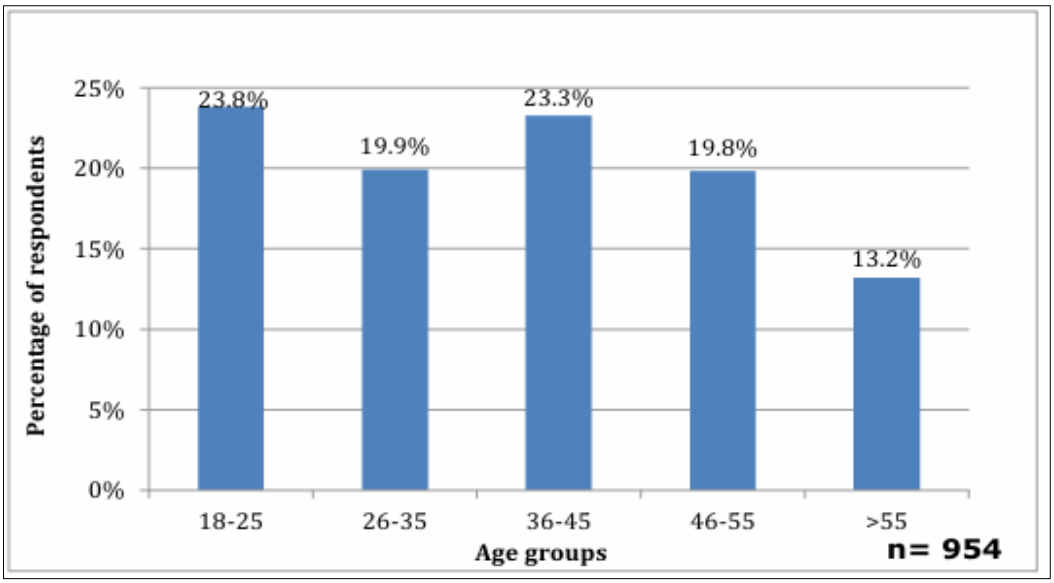

Figure 3: Age grouping of fish consumers

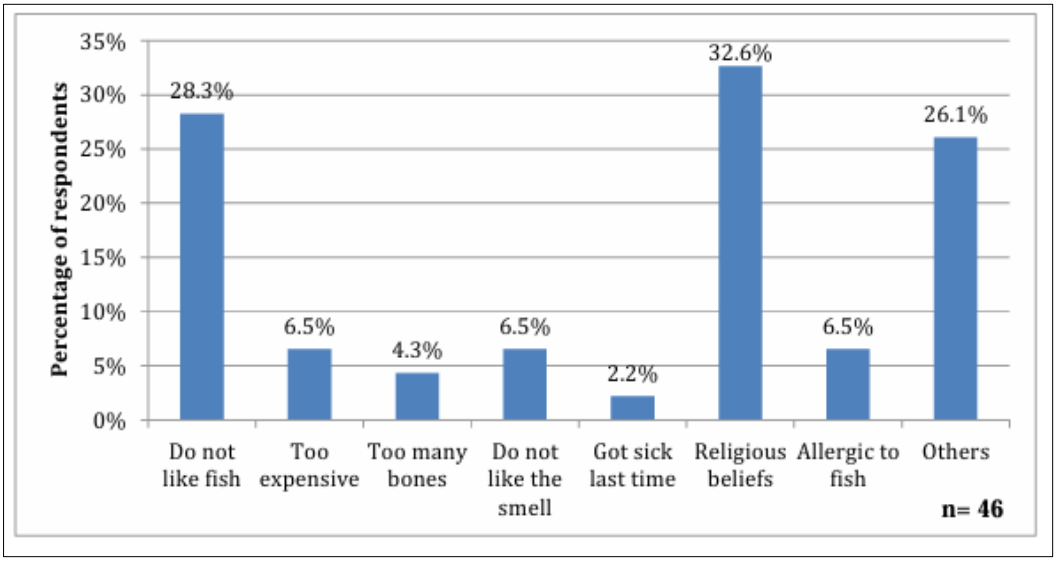

Figure 4: Reasons for not consuming and purchasing fish

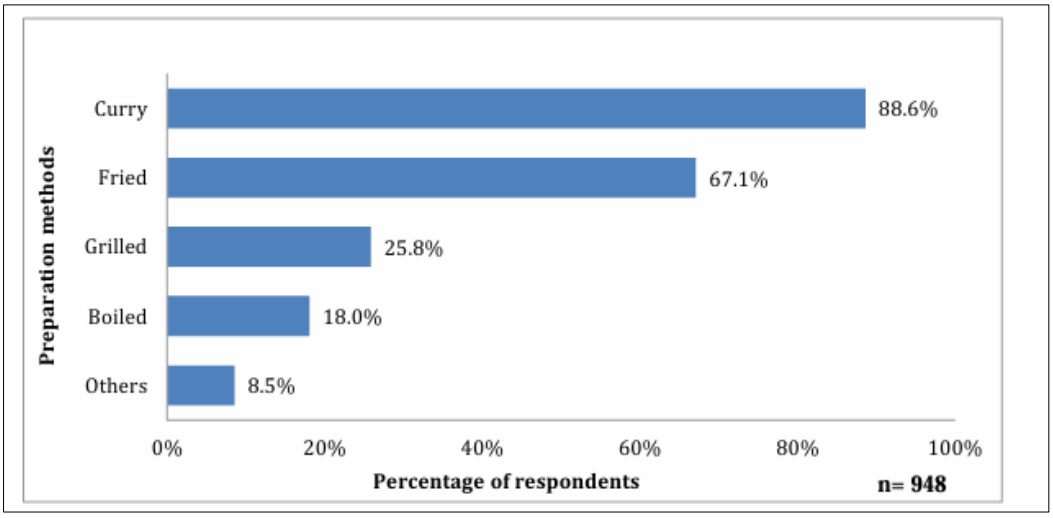

Figure 5: Preferred fish preparation(s)

Consumer Profiles

Table 2: Details of consumers (n=1000)

PROFILES	LABLES	% RESPONDENTS
Residential Area	Urban	51.0
	Rural	49.0
Gender	Male	50.7
	Female	49.3
Age Group	18-25	23.3
	26-35	20.1
	36-45	23.1
	46-55	19.5
	>55	14.0
Educational Level	Primary	15.8
	Secondary	50.7
	Tertiary	31.4
	Vocational	1.1
	No Schooling	1.0
Occupation	Working	69.7
	Not Working	11.4
	Student	13.7
	Pensioner	5.2
Range of household salary	<Rs.5,000	1.9
	Rs 5,000 -10,000	8.3
	Rs.11,000- 15,000	8.7
	Rs.16,000 -20,000	7.0
	Rs.21,000 – 25,000	11.1
	> Rs.25,000	24.2
	No reply	38.8

DISCUSSION

During this survey, a variety of documents were reviewed, namely AMSAT International (2011), which looks at fish and animal protein consumption in Timor-Leste; Fish Consumption Survey in Banda Aceh; ARC/FAO, Survey of Fish Consumption in Madras, BOBP, 1992; and Baya, J. F. L., 2013. A Conceptual Framework for the Investigation of Fresh Fish Availability and Consumption in Regions of Saint Pierre, Rose Hill, and Quatre Bornes in Mauritius. Kareemun Z.B., 2013, there is scope to reflect on the current state of consumer knowledge on the nutritional benefits of fish to improve awareness. The consumption/purchase of fish and other fishery products among the respondents was well spread throughout the different age groups, with the highest percentage of fish consumption/purchase within the groups ranging between 18 and 45 years old. The frequency of fish consumption, despite the availability of other meat products, is a good indication of health awareness/benefits from consuming fish regularly by the population [13]. An evaluation of consumer behaviour relating to aquaculture and food security in Kayalpattinam. Other documents have also been referred to in this report.

CONCLUSION

The use of Android application surveys offers numerous advantages in data collection, including exposure only to relevant questions through conditional logic or skip patterns, ensuring respondents only see questions based on their previous answers, making the survey faster and more engaging. It also enables the opportunity to ask sensitive questions more comfortably, as people may feel more secure responding through a private mobile interface rather than in face-to-face interviews.

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