THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
Nov, 2023 3(11), 2976-2979

Popular Article

Non-Parametric tests using R software: Case of fish consumption behaviour among fisheries science students

Gomathy V[1*]., B. Manikandan[2] and S. Vivitha[3]
[1,2] Contractual Assistant Professor, Department of Fisheries Extension, Economics and Statistics
[3]Post Graduate Scholar, Department of Fisheries Extension, Economics and Statistics
Fisheries College and Research Institute, Thoothukudi, Tamil Nadu, India
https://doi.org/10.5281/zenodo.10210972

Abstract

Non-parametric is a distribution-free test used when the sample is skewed. Wilcoxen sign rank test, Mann-Whitney, Kruskal-Wallis, and Chi-squared test were used to study the fish consumption behaviour among the students of fisheries science using R software. The study found an increase in fish consumption among family members after the positive influence of fisheries students.

Introduction

The non-parametric test is a distribution-free test that is normally done when the distribution of the sample is not known. It is the best alternative method for parametric tests and it is used when sample is skewed, sample size is too small and ordinal or nominal data. Wilcoxen signed rank test, Mann-Whitney U test, Kruskal-Wallis rank sum test and Chi-squared test are commonly used non-parametric tests in social science studies. Further, R is an open-source free programming language often used as a data analysis and statistical software tool.

Fish consumption among fisheries science students

A total of 31 respondent's studies undergraduate and postgraduate in fisheries science at Fisheries College and Research Institute, Thoothukudi during October 2023 were randomly sampled to study the fish consumption pattern among them. The average age of the respondent is 21 years. 67% and 23% of the respondent belongs to Coastal and Inland districts respectively. Among them 91 % of the respondent consumes fish. The average family size is 4 and consumes 6.5 kg of fish in a month. 40% of the respondents say that they prefer fish due to its nutritional advantage followed by 27% due to its taste and 18% due to its accessibility. Most of the respondents (70%) consume in the form of curry followed by fry (24%). Most of the respondents (42%) buy fish every week followed by twice a week (27%) and monthly (24%). 55% of the respondents prefer marine fish since the majority belong to coastal districts followed by Inland fish (33%) and the rest (12 %) prefer both marine and inland. Sardine and Seer fishes are the most

Published: **27.11.2023**

purchased fish varieties in coastal area whereas, respondents from inland area prefers IMC, Tilapia and Murrel.

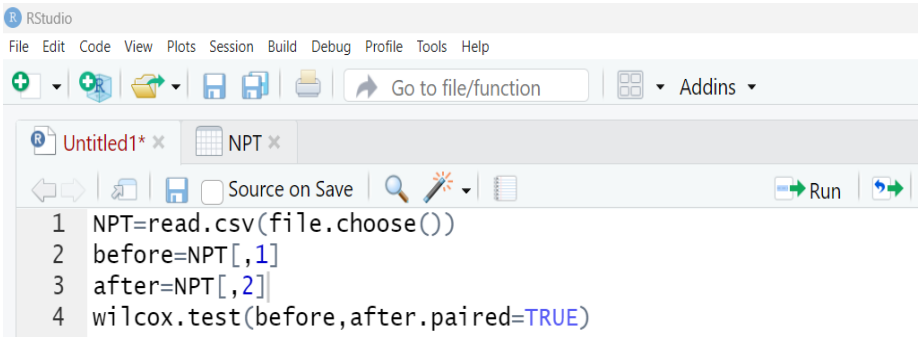
Further, 64 % of the respondents buy fish at fish markets, followed by vendors (18 %) and fish landing centres (18 %). The majority of respondent have fish markets in less than 2 km, and 27 % of the respondent says they have fish market above 5 km. Most (52 %) of the respondent says they prefer chicken when they dine out with family members followed by seafood (45 %) and mutton (3 %).

Wilcoxen signed rank test

It is used to compare the two paired samples and an alternative to parametric paired samples t-test. The change in fish consumption among family members before and after the influence by fisheries students has been tested with the Wilcoxon signed rank test.

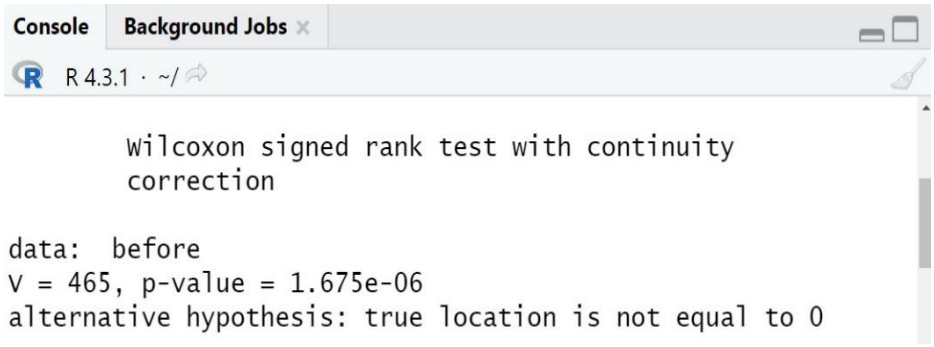
H_0: There is no change in fish consumption among family members before and after the influence of fisheries students

H_1: There is a change in fish consumption among family members before and after the influence of fisheries students



Result

The calculated p-value is < 0.05 ($1.67x10^{-6}$) thus rejection of H_0. Hence, a significant difference is found in average fish consumption among family members before and after joining as fisheries students. And, the average fish consumption has increased since joined as a fisheries science student.



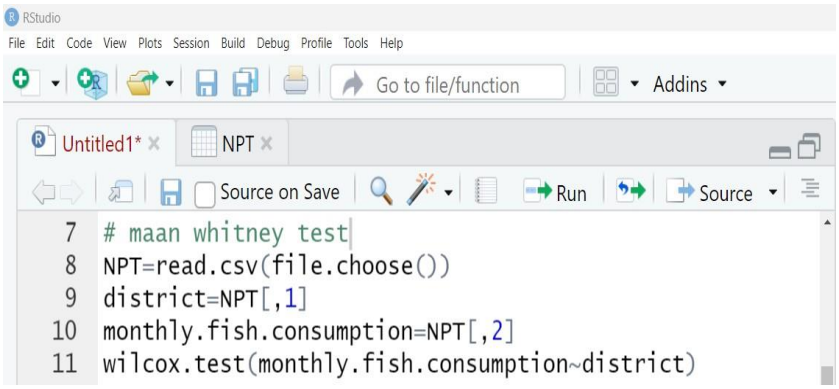
Mann-Whitney U test

It is used to compare two independent samples. The difference in average monthly household fish consumption between respondents belonging to coastal and inland district were analysed through Mann Whitney test.

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published: 27.11.2023

H_0: There is no significant difference in household fish consumption between respondents belong to the coastal and inland district

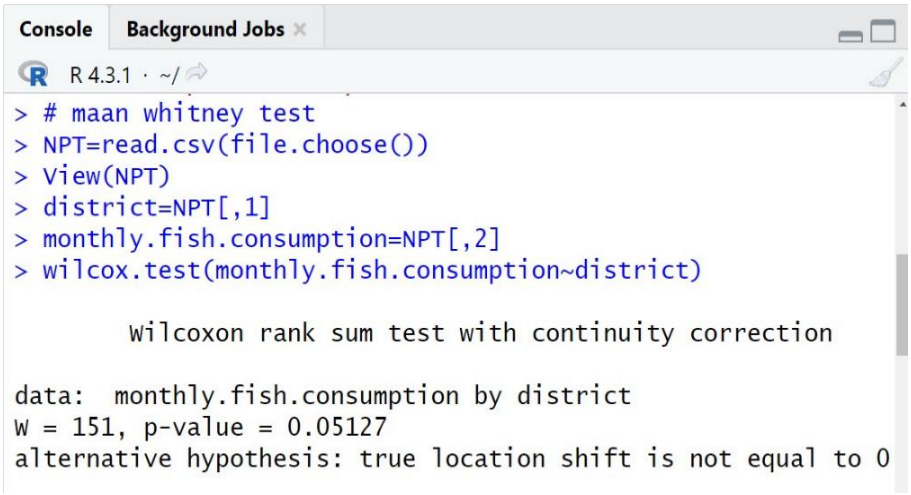
H_1: There is a significant difference in household fish consumption between respondents belong to the coastal and inland district



Variables: monthly fish consumption (kg); district - Coastal (1), Inland (2)

Result

The calculated p-value is greater than 0.05 (0.051) indicates acctance of H_0. Thus, there is no significant difference in household fish consumption between respondents belong to the Coastal and Inland districts that indicates the uninterrupted supply and accessability of fish in Coastal and Inland areas.



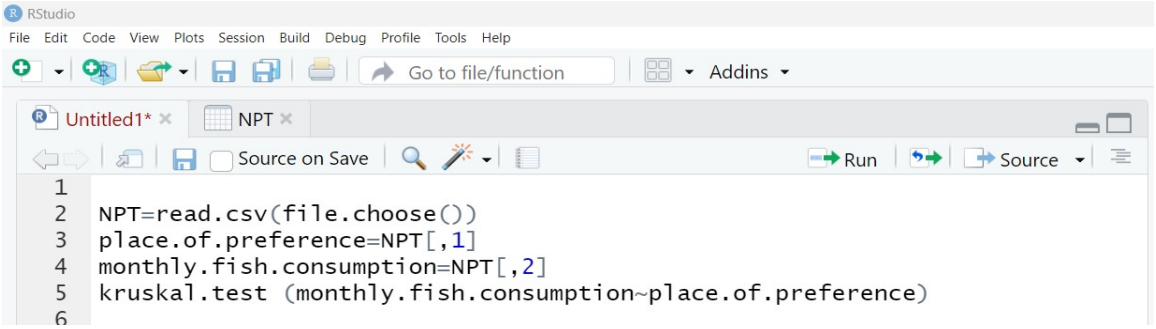
Kruskal-Wallis rank sum test

It is used to compare more than two independent samples and is an alternative to one-way ANOVA. The difference in average monthly fish consumption between respondents purchase fish at fish markets, vendors and landing centres was studied.

H_0: There is no significant difference in average monthly fish consumption between respondents purchase fish at the fish market, vendors, and landing centre

H_1: There is a significant difference in average monthly fish consumption between respondents purchase the fish at fish market, vendors, and landing centre

Variables: monthly fish consumption (kg); place of preference - fish market (1), vendor (2), landing centre (3)



Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published: 27.11.2023

Results

The calculated p-value is greater than 0.05 (0.938) indicating that there is no significant difference in average monthly fish consumption between respondents purchase fish at fish markets, vendors, and landing centres that shows distance is not a barrier to consume fish.

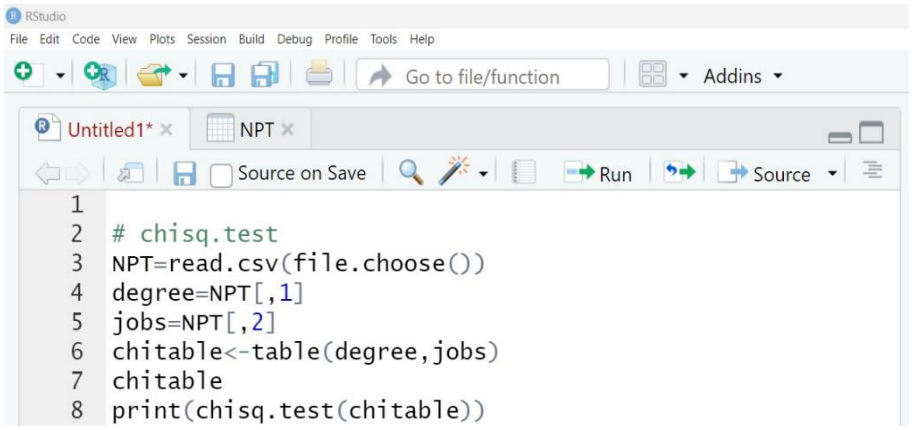
```
Console  Background Jobs
R 4.3.1 · ~/
> View(NPT)
> place.of.preference=NPT[,1]
> monthly.fish.consumption=NPT[,2]
> kruskal.test (monthly.fish.consumption~place.of.preference)

        Kruskal-Wallis rank sum test

data:  monthly.fish.consumption by place.of.preference
Kruskal-Wallis chi-squared = 0.12643, df = 2,
p-value = 0.9387
```

Chi-squared test

It is used to check the dependency of the categorical variable. The dependency between entrepreneurship attitude and degree standard (UG/PG) among fisheries science students was tested through a chi-square test.



H_0: There is no dependency between entrepreneurship attitude and degree standard

H_1: There is a dependency between entrepreneurship attitude and degree standard

Variables: Degree standard- UG (1), PG (2); Entrepreneurship attitude – no (0), yes (1)

```
Console  Background Jobs
R 4.3.1 · ~/
> chitable<-table(degree,jobs)
> chitable
      jobs
degree  0  1
     1 19  3
     2  8  1
> print(chisq.test(chitable))

        Pearson's Chi-squared test with Yates' continuity
        correction

data:  chitable
X-squared = 1.4399e-30, df = 1, p-value = 1
```

Result

The calculated p-value is greater than 0.05 (1.00) indicates there is no dependency between entrepreneurship attitude and the degree standard. Both undergraduate and postgraduate students prefer secured government jobs than to risk-taking entrepreneurs.

Conclusion

Fish consumption among family members has increased after the influence of fisheries science students. The respondents belong to coastal and inland areas consumes almost equal quantum of fish. Interestingly, distance is not considered a barrier to buying fish among the consumers. Also, the study found that there is no dependency between students' degree standards that is UG or PG and to become entrepreneurs in the fisheries sector.

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published: 27.11.2023