

How to write a Scientific Article



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What is an article ?

- An article describes the study or research performed by an author
- Is based on new evidence from a study or an experiment

Types of articles

- Original article
- Review article
- Case report
- Case series

Original article

- Most common in basic science
- Original means true and authentic, not copied from existing source
- An original article is based on research result
- Is written by the person or people who conducted the experiment or observations

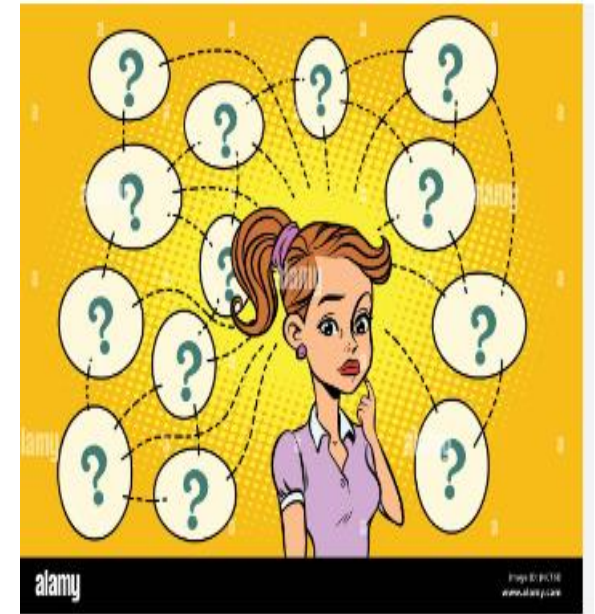
Basic subjects in Medical Science

1. Anatomy
2. Physiology
3. Biochemistry

Some questions to be kept in mind before starting to write an article

- Did I perform something new and interesting?
- Do I have solid evidence and clear answers to support my hypotheses and proposed goals?
- Are the conclusions of this study relevant?

If all answers are “yes” , then start preparing a paper



• The first step is  Literature search

It is essential

- whether there has been any prior research on the issue to be studied
- to understand the research findings and identify the strengths and limitations of the prior research
- to make the target of the research specific
- to find out the feasibility of the research

Article structure

- Title
- Authors
- Abstract
- Keywords



Need to be accurate and informative for effective indexing and searching

Main text (IMRAD)

- Introduction
- Methods
- Results and
- Discussion



Each has a distinct function

- References

Title page

- Full title of article
- Main author
- Co-authors
- Address of Correspondence

The Title

A good title

- Adequately describe the core contents of the paper in the fewest possible words
- Arouses curiosity and can lead the reader to read the article



Criteria of title

- Title should neither be too short nor too long
- Should be concise, specific and informative
- Should contain keywords that capture attention of the reader
- No abbreviations should be used

Morphometry of Left Talus with Sex Differences



Study of Sexual Dimorphism By Bone Length,
Width and Height Estimation in Left Talus



Current Status in Medical Genetics : Bangladesh Perspective

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Abstract

- An abstract is a brief summary of a research article
- Allows a reader to quickly and accurately identify the basic content of the paper

Criteria of an Abstract

It should

- be written clearly
- not exceed 250 words
- be written in one paragraph
- be written in past tense
- not cite any references
- provide a brief summary of each of the main sections (IMRAD)
- include keywords

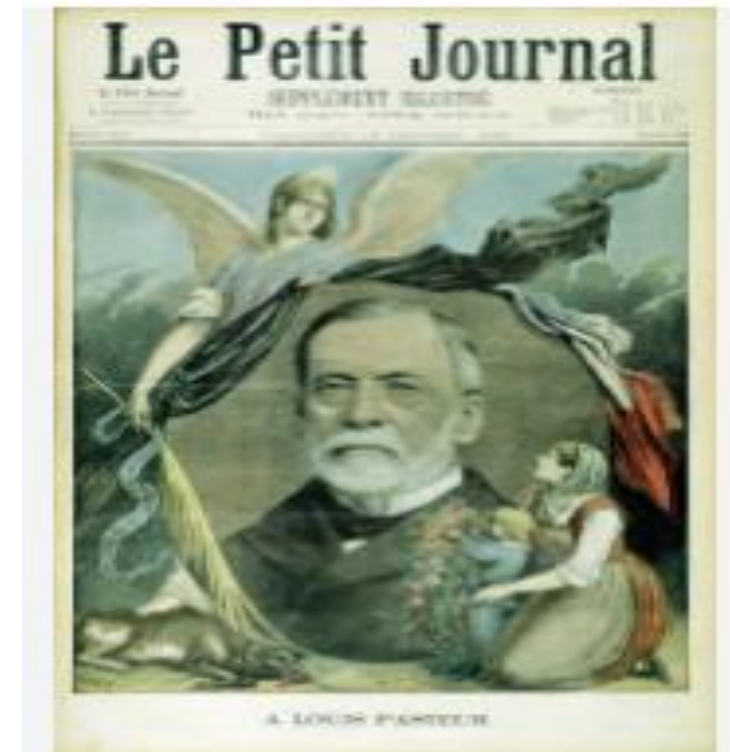
Keywords

- Keywords should be specific
- It should reflect the contents of the paper
- It should be limited within three to six in number

Story of IMRAD

(Introduction, Methods, Results and Discussion)

- Scientific articles in medical science first began in the form of letters and descriptions in the 17th century
- Louis Pasteur developed modern germ theory in 1860 and debuted this IMRAD structure in his book (*Etudes sur la Bière*) in 1876



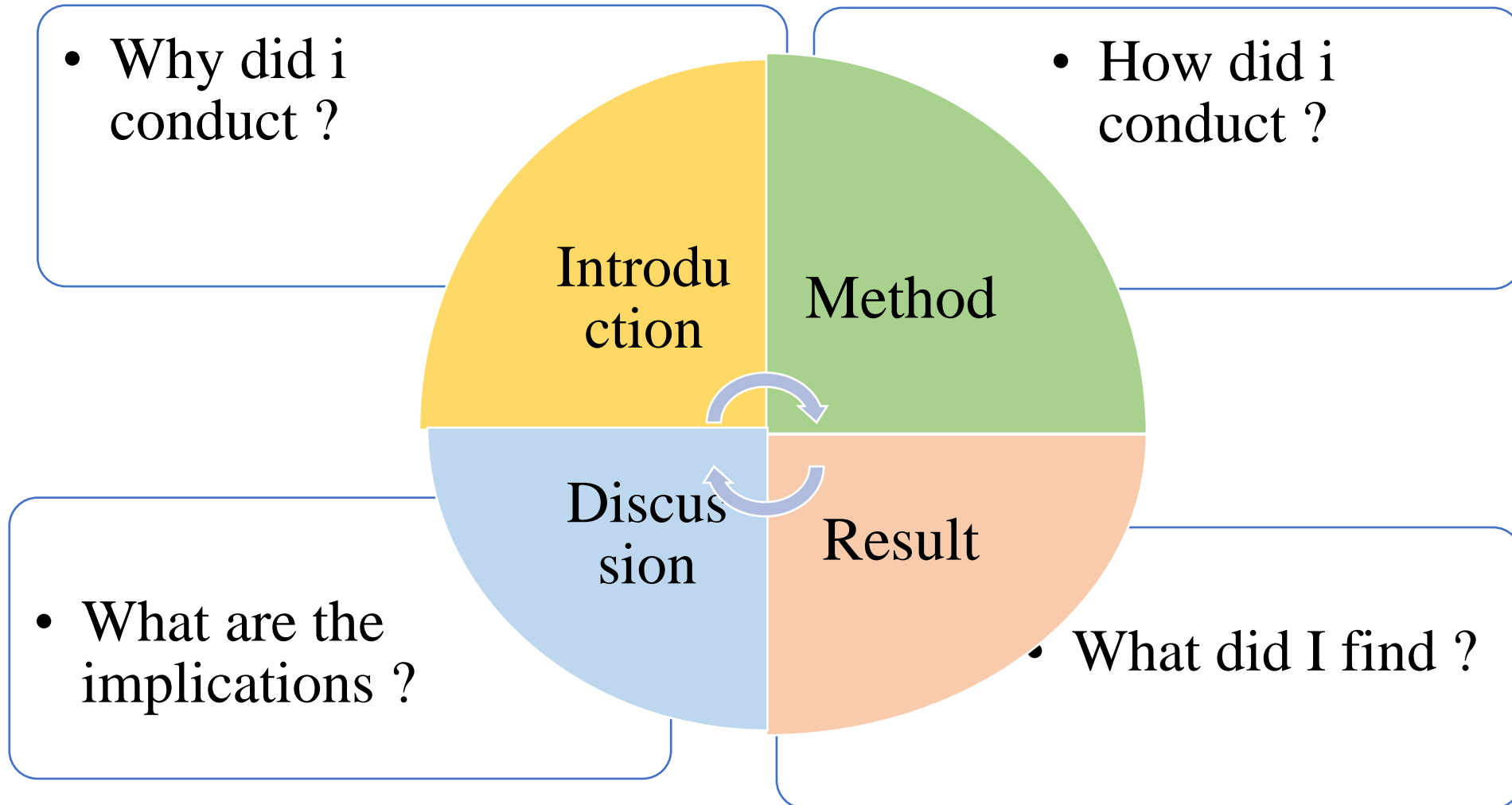
Story of IMRAD

(Introduction, Methods, Results and Discussion)

- One of the key developments in scientific publication since 1950 has been the wide spread adoption of the IMRAD structure



IMRAD format



Correlation of Serum Uric Acid with Heart Rate Variability in Hypertension

Abstract

Introduction: Autonomic dysfunction with dominant sympathetic tone is a common finding among hypertensives and prehypertensives. Uric acid is one of the independent predictors of hypertension. There are very few studies which have shown a relationship between the autonomic tone and uric acid generation pathway among prehypertensives and hypertensives. Aim of the study was to estimate and correlate serum uric acid levels with autonomic function as measured by heart rate variability (HRV) among prehypertensives and hypertensives.

Methods: Cross-sectional study of three groups, prehypertensives, hypertensives and normotensives, classified according to Joint National Committee VII criteria, with 35 subjects in each group were included in this study. Serum uric acid levels were estimated by using colorimetric assay kit. HRV was analyzed after recording lead II Electrocardiogram using RMS Vagus HRV software (RMS, India). One-way ANOVA and Pearson's correlation was done using SPSS 18.0 software.

Results: Mean uric acid levels were 5.62 ± 2.21 mg/dL in normal subjects, 7.06 ± 2.87 mg/dL in prehypertensives and 9.77 ± 2.04 mg/dL in hypertensives. There was statistically significant negative correlation between uric acid and time domain parameters of HRV in the whole sample and among prehypertensives and positive correlation with low frequency power (LF) in ms² and n.u.

Conclusion: Serum uric acid levels were high in prehypertensives and hypertensives as compared to normal subjects. Further, there was statistically significant correlation seen between uric acid levels and sympathetic domain parameters particularly among prehy

Keywords : Uric acid ,Heart rate variability, Hypertension

Introduction



Introduction

- Provide context and rationale of the study
- Content should be clear and concise
- Should be written in 2-3 paragraphs
- To be written in present tense

Introduction

- Only essential and relevant references should be cited
- Existing gaps in the knowledge or conflicting data in prior research is to be highlighted
- The hypotheses and aim of the research study should be articulated

Methods



- Describe the study/experimental procedures
- This section should be the bulk of the paper and it must provide sufficient information so that a reader is benefitted and is interested for further study

Components in methods

- Study design
- Study place
- Study period
- Study sample/population
- Sample size
- Exclusion criteria
- Data collection materials

Components in methods

- Variables of the study
- Operational definitions
- Data collection procedure
- Ethical clearance
- Data analysis

Methods

- This part must be clear, precise so that it can be followed
- Detailed description of new method to be provided
- If the method has been previously published in a scientific journal, only the reference should be given

To carry out methods , materials are required

Materials vary from subject to subject in Medical Science

Materials

- If human subjects are used, selection criteria and written consent should be mentioned and also their sex, age, weight and height must be clearly stated
- If chemicals are used, exact technical specifications/procedure and source or method of preparation should be addressed eg; glucose, chloroform, acetone

Materials

- If blood, serum, stool, urine are used as study materials –patient consent is must
- In animal studies- name of species , age ,weight, ethical approval should be obtained and declare the Home Office License number or equivalent

Materials

Continued

Anatomy

- Bone
- Viscera
- Cadaver
- Histological slide
- Binocular electric microscope
- X-ray , MRI

- Human-Anthropometric
measurement of different parts
of the body
- Medical education
- Genetics
- Plastination

Materials

Physiology and Biochemistry

- ECG Machine
- Sphygomanometer
- Centrifuge Machine
- Spirometer
- Hydrometer

- Hormone Analyzer
- Electrolyte Analyzer
- Urinometer
- Albuminometer

Research Instruments used for data collection

- Pen, paper, scale
- Rating scales
- Checklist
- Interview schedule
- Likert scale

- Tape recorder
- Questionnaire
- Data collection sheet or recording form
- Consent form

Ethical consideration

- The author should mention the name of the ethics committee of the institute where the study has been approved

Methods used for data analyses must be mentioned

- How the data were summarized (e.g., mean \pm SD) ?
- Which statistical test was used for which data ?
- P value at which differences were considered statistically significant ?
- Which Software was used (e.g., SPSS version 11)

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Prevalence of Sydney Creases of Palmar Dermatoglyphic Patterns in Bangladeshi Down Syndrome

- Data was analyzed for statistical significance by Chi-square test, by using a computer-based program SPSS-23. P value was considered significant if it is < 0.05 at 95% level of confidence



Results

- Section should be written in past tense
- To summarize data without interpretation, figures and tables can be used
- The names of the variables, units, legends, etc. should be included

Results

- The information presented in tables and figures should not be repeated in the text
- Do not include both a table and a figure showing the same information

Tables are appropriate for large or complicated data sets

Table 4.1 Anterior, middle and posterior width of trochlea in male and female

Variables	Male n=83 Mean±SD	Female n=67 Mean±SD	p value
Anterior width of trochlea Mean±SD in mm	28.5 ± 1.3 (26.2 - 33.7)	25.2 ± 1.7 (20.3 - 28.4)	<0.001***
Middle width of trochlea Mean±SD in mm	27.5 ± 1.2 (25.1 - 31.8)	24.5 ± 1.8 (20.8 - 27.8)	<0.001***
Posterior width of trochlea Mean±SD in mm	21.0 ± 1.6 (17.3 - 24.7)	18.0 ± 1.6 (14.3 - 21.8)	<0.001***

Figures in parentheses indicate range. SD = Standard Deviation.

Comparison of values between male and female was done by Unpaired Student's 't' test

***= significant at $p < 0.001$ n= sample size

Figures are appropriate for data sets that exhibit trends, patterns or relationships

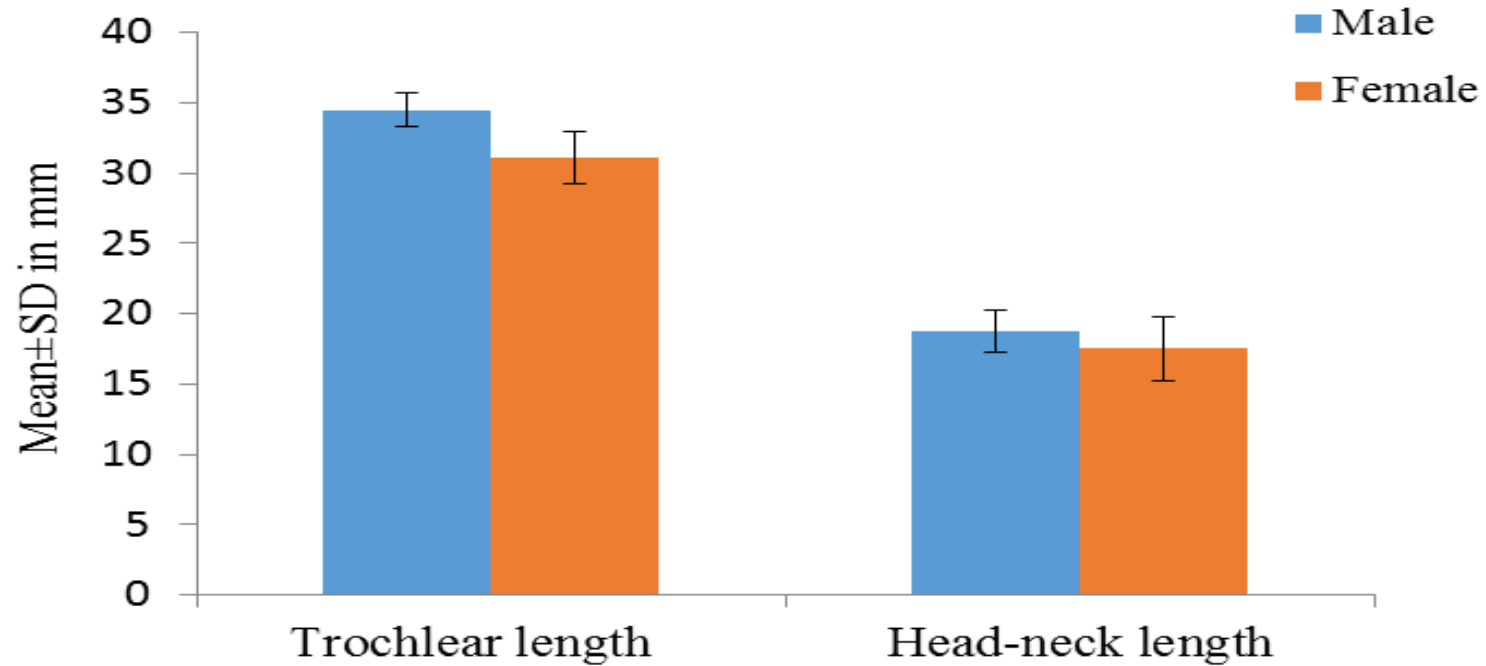


Fig 4.2 Bar diagram showing trochlear length and head-neck length in male and female

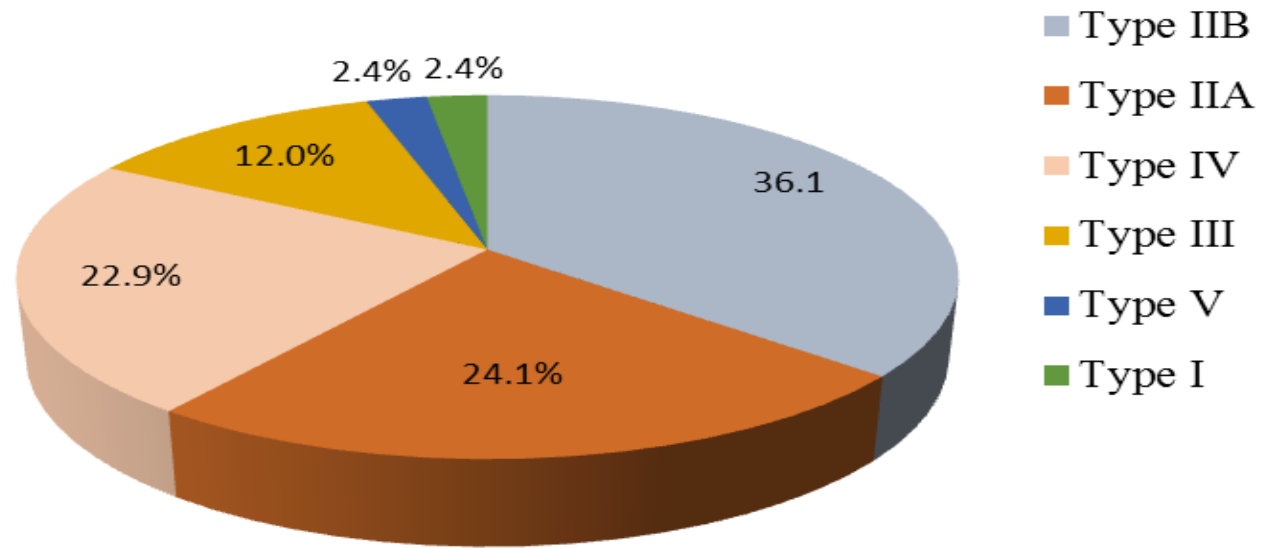


Fig.4.6 Pie chart showing percentage of types of calcaneal articular facets on talus in male



Discussion

Discussion

- Principles, relationships and generalizations shown by the results can be presented
- Repetition of results should be avoided
- Theoretical implications of study and its practical applications should be discussed

Discussion

- Whether the results and interpretations agree or contrast with previously published work ?
- If the results differ from previous studies, highlight the reasons for these differences
- New terms not mentioned previously in the paper should not be included here

CONCLUSION



Conclusion

- It reflects the main message that has been considered in the article
- It should be concise and focused
- No reference should be included in the conclusion

Limitations

- Any limitations of the study must be mentioned
- Also, explain how the limitations may influence the interpretation of the study results

Recommendations

- Suggested action that is based on the conclusion
- Implication of the study may be labeled as recommendation
- Includes a brief "how" to implement or the next step the researcher should take

References

A list of all the references used in the text (Articles from journal, books , websites)

- Reference format varies widely: as per journal
 - **Harvard System (alphabetical by author/date)**
Berridge, MJ 1998, Neuronal calcium signaling, *Neuron* vol. 21: pp. 13-26
 - **Vancouver System (numbered in order or citation)**
1. Berridge MJ. Neuronal calcium signaling. *Neuron*. 1998;21:13-26

Points to remember in Referencing

To check the

- spelling of author names
- punctuation
- number of authors before using “et al.”
- reference style



Continued

Points to remember in Referencing

To avoid

- too many references
- unpublished observations and submitted article not yet accepted
- citing articles published only in local language



Take Home Messages

- Will be able to contribute new knowledge or insights to a particular field of study ?
- Abstract is the main key to open an article, it should be concise and informative
- Methods is the specific procedure /technique used to identify, select, processes and analyze information about a topic

Take Home Messages

- Results and Discussion sections summarizes the main findings of paper and explains the significance of study
- Word limit and reference style should be written as the requirement of journal

References

1. Kotur P F, How To Write A Scientific Article For A Medical Journal? Indian J anaesthesia 2002; 46(1) : 21-25.
2. Ali J S , Baig M, How to write an Original Article. King Abdulaziz University. <https://www.researchgate.net/publication/332447135>
3. Ahmed S , How to write a medical original article: Advice from an Editor .Arab Journal of Urology .(2013)
4. Kang G, Kim S E. How to write an original article in medicine and medical science. Kosin Medical Journal 2022;37(2):96-101

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বিচারক রবীন্দ্রনাথ ঠাকুর

- অগ্নি যেমন পতঙ্গকে নক্ষত্রলোকের প্রলোভন দেখাইয়া আকর্ষণ করে,
মোহিতের সেই আলোকিত গীতবাদ্য বিফুর্ত প্রমোদমদিরোচ্ছ্বসিত কক্ষটি
হেমশশীকে সেইরূপ স্বর্গমরীচিকা দেখাইয়া আকর্ষণ করিত



THANK YOU!



Knowledge Sharing Best Practices: An Ultimate Guide

