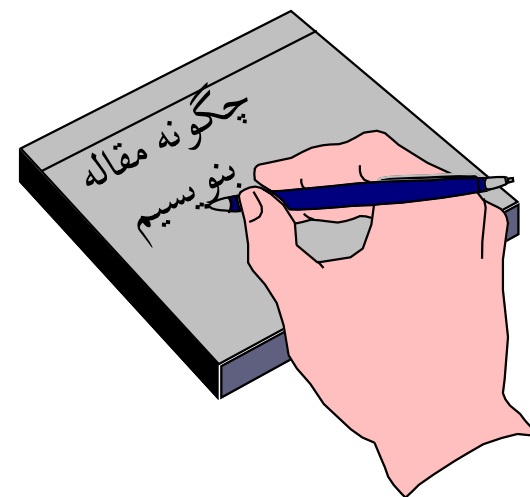


چگونه مقاله بنویسیم؟

دکتر مرتضی قوجازاده

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How to write

method and material
results
statistical findings

METHOD

method

- Allows reader to judge the quality of the work
- Identifies weaknesses
- Allows repetition of the study
- State the study design & specifications

method

- WWWWWH (who, what, where, why, when & how?)
- Define variables
- Patient/Participants inclusion
- Dates
- Randomisation/Placebo/Blindness
- Ethics/consent
- Treatments
- Outcomes and endpoints
- Statistical methods & power

Check-list for Methods

- Study design
- Clear definition of the participants
- Inclusion/exclusion criteria
- logical & chronological order
- Measurements
- Sample size
- statistical analyses
- New techniques validation

Could the reader reproduce your study from the details provided?

Patient / Animals / Specimens

- Numbers
- How are they grouped
- Criteria
- Informed consent obtained

Method ...

- Reason for selecting the design of the study.
- Statistical methods used for analysis
- If standard techniques is used, give appropriate reference, any modifications should be clearly explained
- If new techniques is used, give validity and reliability measures

If applicable ...

- Ethical approval
- Questionnaires
- Interventions
- Clinical assessments
- Proper references

What to include in the methods section

- How the study was designed
- How the study was carried out
 - How the participants were recruited and chosen
 - Give reasons for excluding participants
 - Consider mentioning ethical features
 - Give accurate details of materials used
 - Give exact drug dosages
 - Give exact form of treatments

In Clinical Trials

- Precise details of the interventions **intended** for each group and how and when they were **actually** administered.
- Clearly defined primary and secondary outcome measures and,
- Methods of enhancing the quality of measurements (multiple observations, training of assessors).
- interim analyses and stopping rules

In Clinical Trials

- Method used to generate the random allocation sequence, including details of any restriction (e.g., blocking, stratification).
- Method used to implement the random allocation sequence (e.g., numbered containers or central telephone),
- Concealment
 - Who generated the allocation sequence,
 - who enrolled participants
 - who assigned participants to their groups.

blinding

- Participants
 - those administering the interventions
 - those assessing the outcomes
 - Those analyzing the findings
-
- If done, how the success of blinding was evaluated.

blinding

- Participants
 - those administering the interventions
 - those assessing the outcomes
 - Those analyzing the findings
-
- If done, how the success of blinding was evaluated.

RESULTS

Results

Simple  complex

- Describe the **population**
- Start with **positive** findings
- Establish how **comparable** your groups were
- Use a mixture of text, tables and figures
- Mention units of measurement
- Mention what numbers, brackets, etc. refer to
- Bring the P values

Results

Provide only enough **interpretation** to lead the reader from one experiment to the other

- Avoid lengthy analysis and comparison to the work of others
- No need to follow **chronology of study**
 - Rather, provide a **logical progression** and tell a story

Results

1. Start with **positive** findings.
2. **Do not compare** the present data with previously published results.
3. Write the text of the Results section **concisely** and **objectively**.
4. The **passive voice** will likely dominate here, but use the active voice as much as possible

Tables and Figures

- Consider using a table to present **large amounts** of data/results.
 - Must refer to all tables in text.
- Use **figures** to graphically represent *significant* results.

Results

- Use the “Stand alone” tables
- Make sure totals add to 100%
- Do not repeat the Tables and Figures in text
 - Summarize: e.g., there were no significant associations...
 - Describe: e.g. there was a three fold increase in the risk of ..

Tables and Figures

- Each Table or Figure must include a brief description of the results being presented and other necessary information in a **legend**.
- **Table legends go above** the Table; tables are **read from top to bottom**.
- **Figure legends go below** the figure; figures are usually **viewed from bottom to top**

Tables and Figures

- Tables and Figures are **assigned numbers** separately and in the sequence that you will refer to them from the text.
 - The first Table you refer to is Table 1, the next Table 2 and so forth.
 - Similarly, the first Figure is Figure 1, the next Figure 2, etc.

Tables and Figures

- When referring to a table *from the text*, "Figure" is abbreviated as Fig., e.g., **Fig. 1.**
- Table is never abbreviated, e.g., **Table 1.**

Table 4. Population variation in hatch success (mean percent) of unfertilized eggs for females from populations sampled in 1997. N = number of females tested.

Population	mean (%)	Standard deviation	Range	N
Beaver Creek ^T	7.31	13.95	0-53.16	15
Honey Creek ^T	4.33	7.83	0-25.47	11
Rock Bridge Gans Creek ^T	5.66	13.93	0-77.86	38
Cedar Creek ^P	6.56	9.64	0-46.52	64
Grindstone Creek ^P	8.56	14.77	0-57.32	19
Jacks Fork River ^P	5.28	8.28	0-30.96	28
Meramec River ^P	5.49	10.25	0-45.76	45
Little Dixie Lake ^L	7.96	14.54	0-67.66	71
Little Prairie Lake ^L	6.86	7.84	0-32.40	36
Rocky Forks Lake ^L	3.31	4.12	0-16.14	43
Winegar Lake ^L	10.73	17.58	0-41.64	5
Whetstone Lake ^L	7.36	12.93	0-63.38	57

^T = temporary stream, ^P = permanent streams, ^L = lakes. **---footnotes**

---Table legend

---Column titles

---Table body (data)

---Lines demarcating the different parts of the table

Table 2. Log-likelihood tests of deviation from 1:1 sex ratios for nymphs collected from each population in 1997 and 1998. Values are ratios of female:male; sample sizes are in parentheses. Bonferroni corrected probabilities are shown with an asterisks.

Population	Year	
	1997	1998
Beaver Creek ^T	9.00:1(20)***	2.67:1 (22)*
Honey Creek ^T	9.00:1(56)***	2.27:1 (98)***
Rock Bridge ^T	3.33:1(26)**	2.09:1 (68)**
Cedar Creek ^P	2.05:1(119)***	1.87:1 (198)***
Grindstone Creek ^P	-	2.26:1 (140)***
Jacks Fork River ^P	2.89:1(35)**	5.17:1 (37)***
Meramec River ^P	2.80:1(38)**	2.41:1 (58)**
Little Dixie Lake ^L	2.45:1(494)***	2.46:1 (384)***
Little Prairie Lake ^L	2.38:1 (71)***	2.08:1 (157)***
Rocky Forks Lake ^L	2.55:1 (213)***	2.93:1 (299)***
Winegar Lake ^L	3.41:1 (207)***	2.34:1 (204)***
Whetstone Lake ^L	2.69:1 (381)***	2.01:1 (268)***

* significant at $p < 0.05$; ** significant at $p < 0.005$; *** significant at $p < 0.001$.

^T = temporary stream, ^P = permanent streams, ^L = lakes.

Figures

- Used when we want to **distinguish** a result & make it **prominent** into readers view
- Figures are **visual presentations of results**, including graphs, diagrams, photos, drawings, schematics, maps, etc.
- **Graphs** are the most **common type** of figure.
- Graphs show **trends** or **patterns** of relationship.

Figures

- Avoid clutter (too many numbers & symbols)
- Should provide a **clear statistical message**
- Vertical (“Y”) axis: **outcome/dependent variable**
- Horizontal (“X”) axis: **exposure/independent variable**
- Name & **define** each axis
- Give the **measurement unit** of each axis

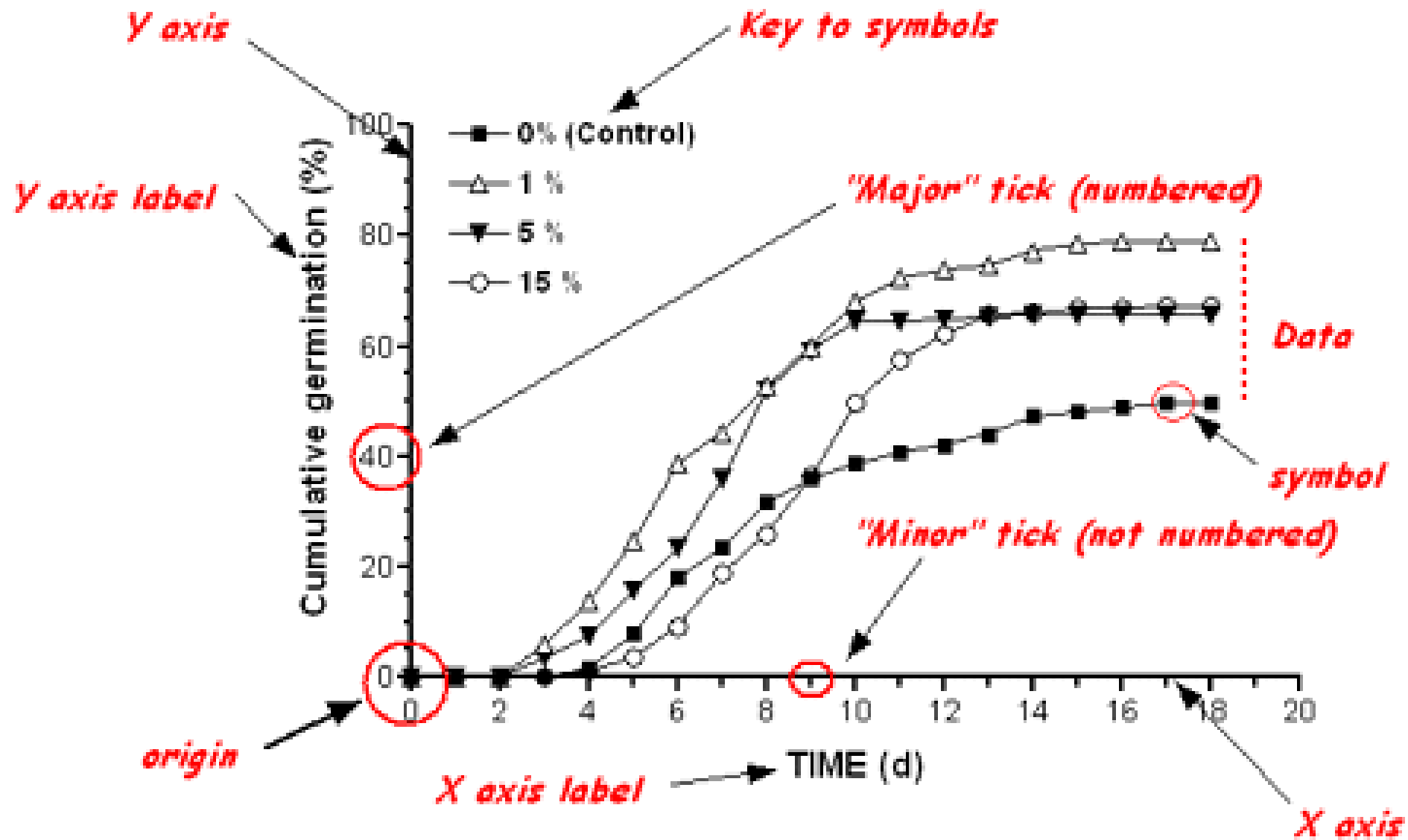


Figure 1. Cumulative germination of *Chenopodium* seeds after pregermination treatment of 2 day soak in NaCl solutions. n = 1 trial per treatment group (100 seeds/trial.)

legend

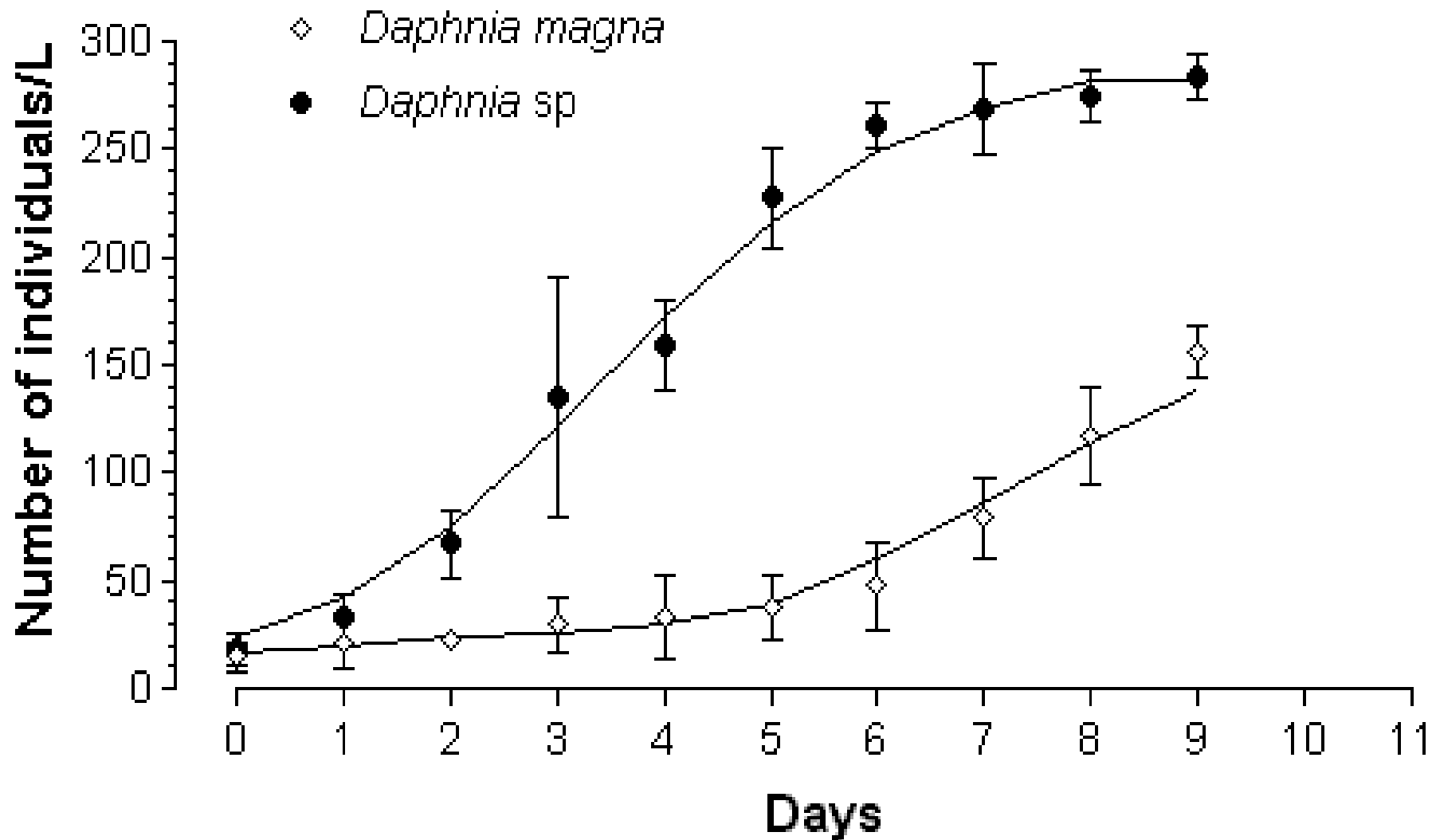


Figure 2. Mean population density (± 1 standard deviation) of two species of *Daphnia* following artificial eutrophication of a small farm pond by application of organic fertilizer. Six replicate 1 L water samples were drawn from 50 cm depth at 1100 hr each day.

Common mistakes

- Raw data
- Redundancy
- Discussion and interpretation of data
- No figures or tables
- Methods/materials reported

Figure: *Before*

Figure 1. Effect of total alkaloid fraction of methanolic extract on mean survival time

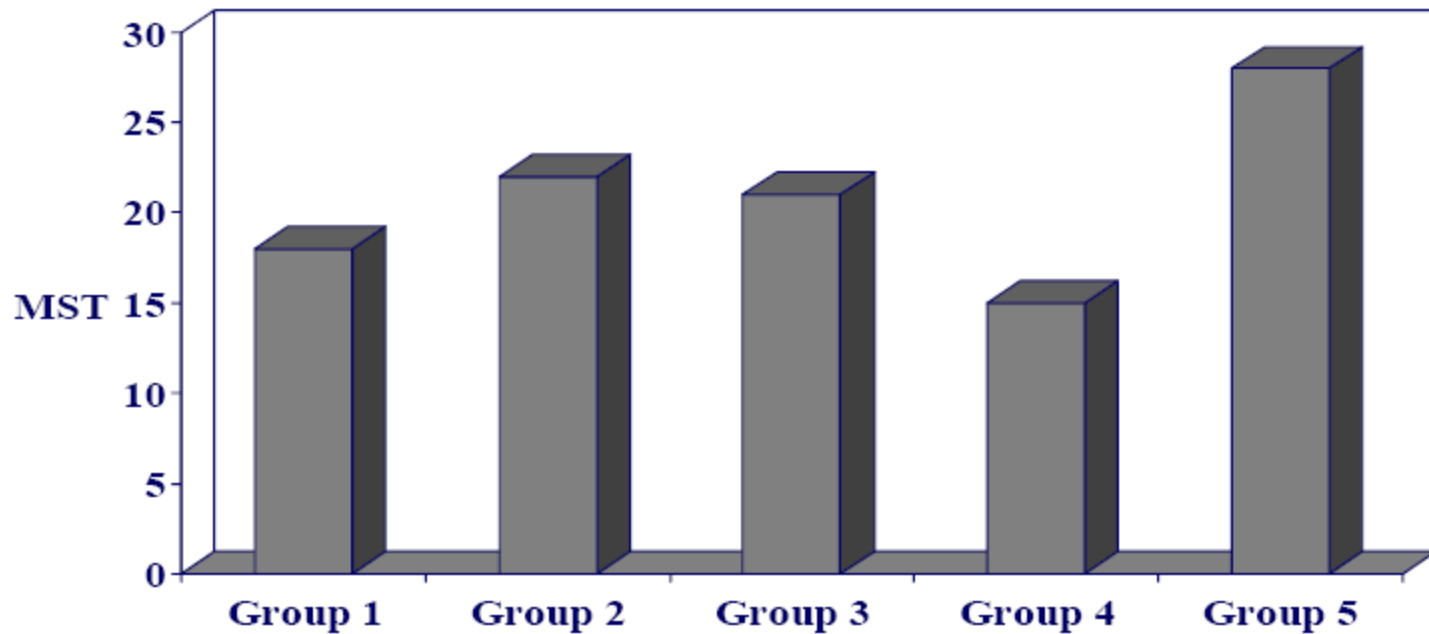


Figure: *After*

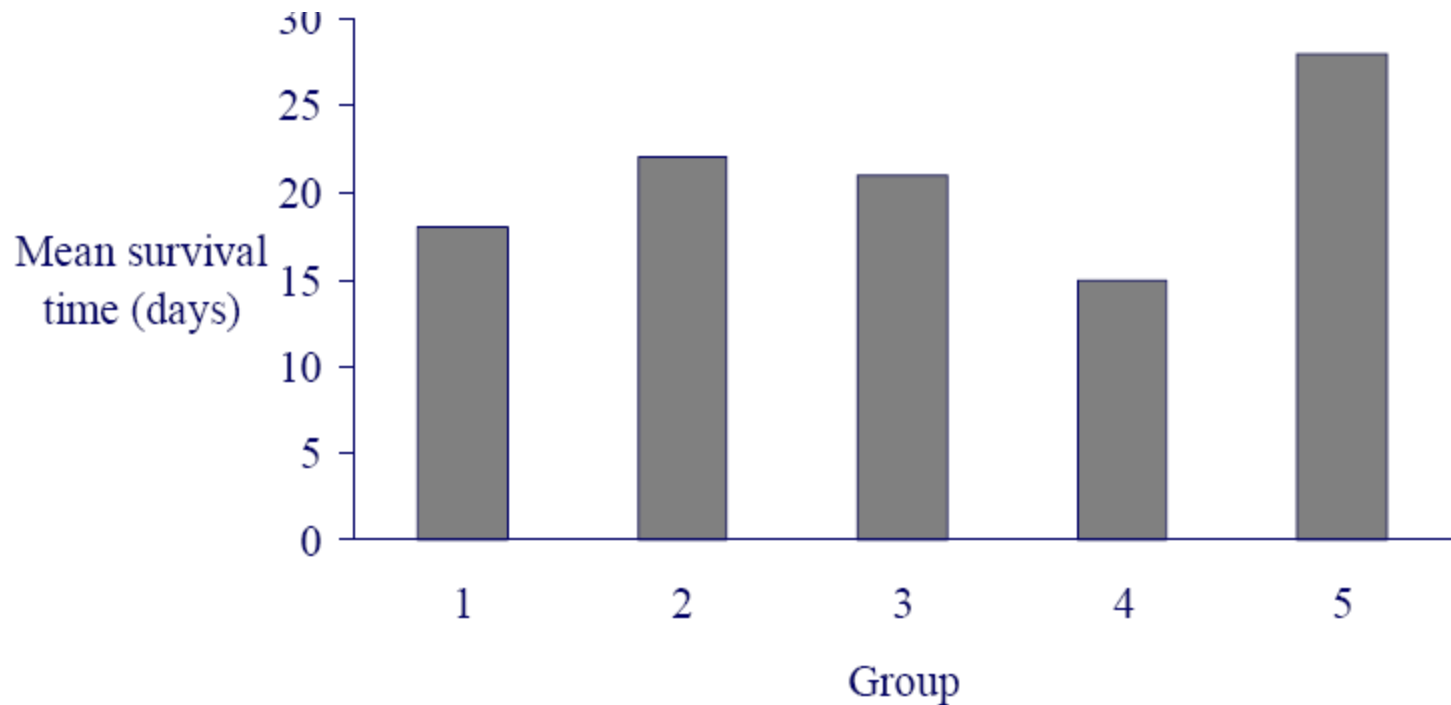


Figure 1. Effect of total alkaloid fraction of methanolic extract of unripe fruit of *Solanum pseudocapsicum* on mean survival time (MST) in tumor bearing mice.

Figure: *Example*

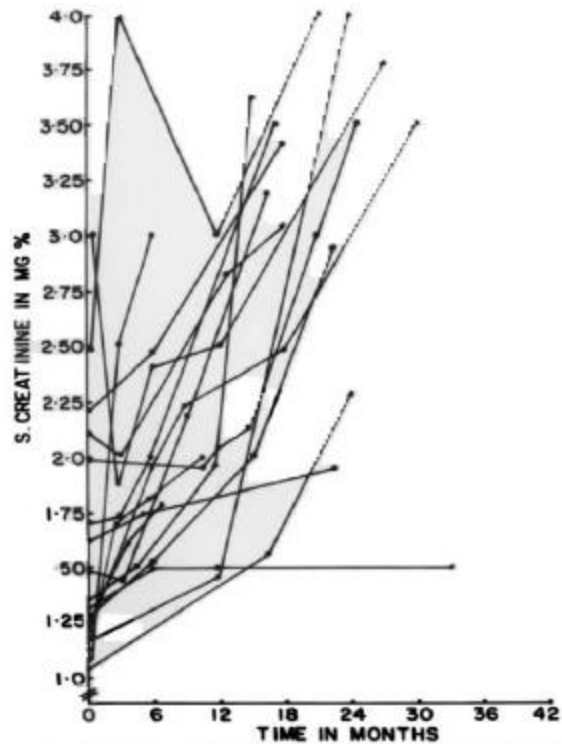


FIG. 2 : S. CREATININE LEVELS ON FOLLOW-UP IN GROUP I PATIENTS

Something to avoid !

- Do not present the same data in **both** a **Table and Figure** - this is considered redundant and a waste of space and energy.
- Decide which format **best shows** the result and go through it.
- Do not report raw data values when they can be summarized **as means, percents**, etc.

Do NOT !

- Use big words that you do not really mean
 - Attributable
 - Causality
 - Preferential
 - Significant (without statistical evidence)
 - Validity
- Mix incidence and prevalence
- Mix frequency, rate, proportion, ratio

Statistical findings

- For each primary and secondary outcome, a summary of results for each group, and the estimated effect size and its precision (e.g., 95% confidence interval).
- Address multiplicity by reporting any other analyses performed, including subgroup analyses and adjusted analyses, indicating those prespecified and those exploratory

گزارش نتایج آماری

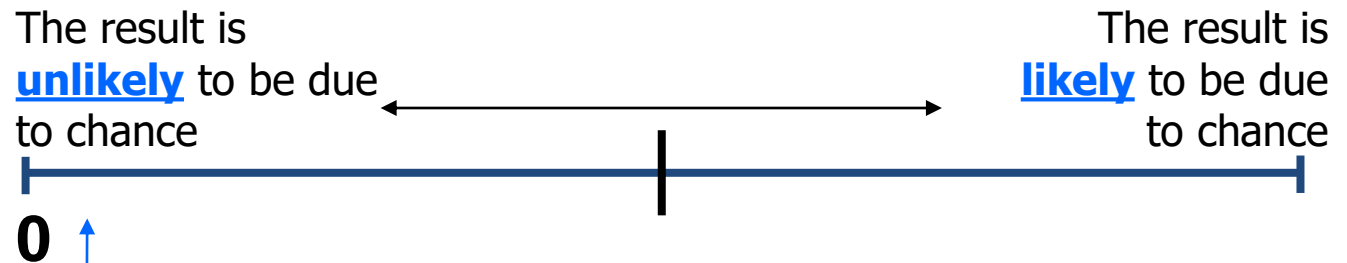
- نوشتن تعداد فراوانی همراه با درصدها وقتی تعداد نمونه اندک است.
- عدم نیاز به نوشتن فرمول‌های حجم نمونه و آزمون‌های آماری
- ارائه پارامترهایی که آزمون شده‌اند مانند میانگین، نسبت یا درصد، ضریب همبستگی، حتی اگر آزمون‌ها معنی‌دار نشده باشند.
- نوشتن شاخص آزمون و مقدار آن همراه با درجه آزادی و
p-value
- نوشتن مقدار دقیق p-value برای آزمون‌های معنی‌دار
و غیرمعنی‌دار (تا دو رقم اعشار)

گزارش نتایج آماری

- تعریف کردن علائمی که برای نتایج معنی‌دار به کار می‌رود (مانند ستاره) و به کار بردن علائم مشابه
- نوشتن اعداد به صورت گرد شده با در نظر گرفتن دقت داده‌های اولیه (میانگین تا یک رقم اعشار و انحراف معیار و خطای معیار تا دو رقم اعشار بیشتر از داده‌های خام)
- درج درصدها تا یک رقم اعشار (گاهی حتی نیاز به ارقام اعشاری هم نیست).
- نوشتن شاخص‌هایی مانند r , t تا دو رقم اعشار

p-value

Could the result have occurred by chance?



$p < 0.05$ a statistically significant result

$p > 0.05$ not a statistically significant result

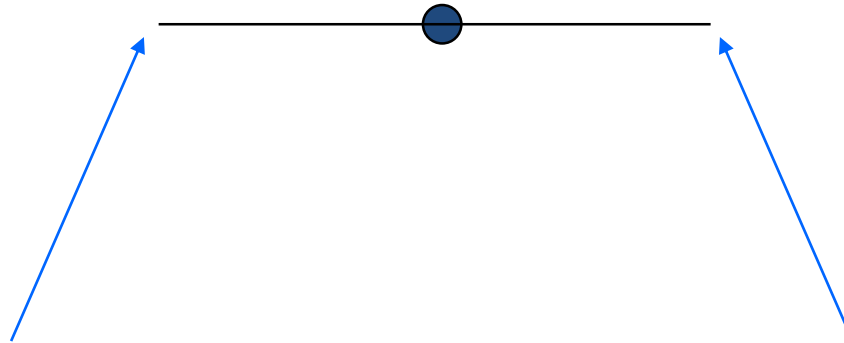
$p = 0.05$

$\frac{1}{20}$ or 1 in 20
result fairly unlikely to be due to chance

$p = 0.5$

$\frac{1}{2}$ or 1 in 2
result quite likely to be due to chance

Confidence Interval (CI)



Is the range within which the true size of effect (never exactly known) lies, with a given degree of assurance (usually 95%)

Check list for Results

- Baseline data provided?
- Primary and other endpoints clear and complete?
- Does the text complement figures and tables?
- Are measures of uncertainty mentioned?

In Results

- Tell a story
- Use the most logical sequence to present the data (not necessarily the order in which you did the experiments)
- Just report the data - do not include interpretation or comparison to literature
- No duplication of data

Guidelines for Writing Results

- Specify the dates of the study
- Provide a schematic summary
- Describe the characteristics of each group
- Indicate if the sample is representative
- Indicate if randomization was successful
- Describe duration and nature of follow up

The Study Outcomes

- Present the results for all primary endpoints
- Report statistical findings in detail
- Report actual p values , 95% CI , etc.
- Report the main findings in figures or tables, *you don't need to also report them in the text*
- Report confounders

A Few Rules

- The first time you use an abbreviation, define it
- When you give the commercial source for a reagent, the first time you cite the source include the location of the company (city and state)
- Make sure the subject and verb agree in every sentence
- No exclamation points!

A Few Rules - continued

- Look for redundancy within the manuscript
- Try not to use “it” or “they” - be specific!
- No jargon
- Two shorter sentences are frequently much more effective than a long, complex sentence
- “Data” is plural not singular, i.e., “the data are...”
NOT “the data is...”

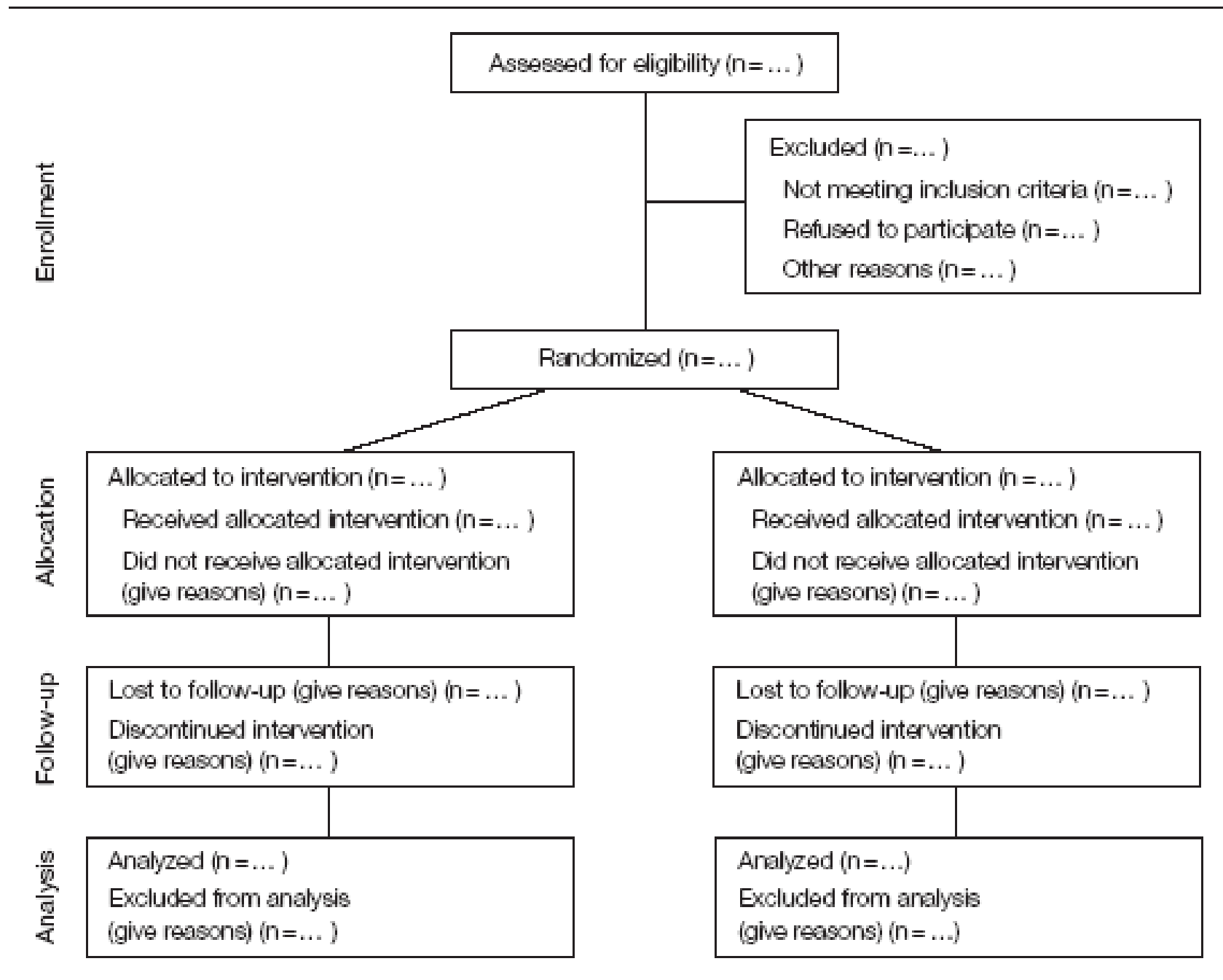
A Few Rules - continued

- Capitalize people's names
- Never, ever plagiarize! (even from yourself!)
- Use numbers when expressing measurements, except when the number would begin a sentence

In Clinical Trials: Participant flow

- Flow of participants through each stage (a diagram is strongly recommended). Specifically, for each group report the numbers of participants randomly assigned, receiving intended treatment, completing the study protocol, and analyzed for the primary outcome. Describe protocol deviations from study as planned, together with reasons.

Figure. Flow Diagram of Subject Progress Through the Phases of a Randomized Trial



Remember ...

- Number of participants (denominator) in each group included in each analysis and whether the analysis was by “intention-to-treat.”
- State the results in absolute numbers when feasible (eg, 10/20, not 50%).
- All important adverse events or side effects in each intervention group.