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Patterns and Risky Practices of Analgesic Use, and Public Awareness of Their Adverse Effect in Dongola Locality, Sudan: A Cross-Sectional Study

This research proposal is submitted in partial fulfillment of the requirements for the Master degree

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1. **Introduction**

- Background Information:

Pain is a prevalent symptom that prompts individuals to pursue medical care or to self-administer painkillers and it's the most common complaint in the emergency department .(1,2)

Analgesic drugs, particularly non-steroidal anti-inflammatory drugs (NSAIDs) and paracetamol, are among the most widely used medications globally because of their easy accessibility and effectiveness in relieving pain and reducing fever. However, the broad accessibility of these drugs without a prescription has led to their improper and excessive usage, which poses serious health hazards such as hepatotoxicity, gastrointestinal bleeding, renal impairment, and cardiovascular problems.(3,4)

Self-medication with analgesics is common in many low- and middle-income countries, including Sudan, for a number of reasons, including lack of access to healthcare facilities, financial limitations, Inadequate enforcement of rules, and low public awareness of the possible side effects of these medications, for example in Sudan studies in pregnant women attending soba teaching hospital 80% reported self-medication, with 32.5% using analgesic (5) .The availability of over-the-counter (OTC) analgesics frequently encourages polypharmacy, improper dosage, and unsupervised usage, raising the risk of medication interactions and toxicity. The general public's lack of understanding about the appropriate use of analgesics and the significance of seeking medical advice before consuming them has been brought to light by earlier research carried out in various locations.(6)

Despite the widespread use of analgesics in Sudan, little study has been done on community-level public awareness, usage patterns, and related dangerous behaviors. Understanding these trends is essential to developing successful health education initiatives, guiding the formulation of laws, and ensuring responsible medication use. In the Dongola area of the Northern State of Sudan, self-medication and the accessibility of over-the-counter medications are common, but little is known about analgesic use patterns.Thus, the purpose of this study is to determine the prevalence of analgesic usage

patterns and risky behaviors as well as the degree of public awareness of the negative consequences of these drugs among adults in the Dongola area.In addition to highlighting the need for community-based interventions and legislative measures to encourage safer medication behavior, the results are anticipated to offer important insights into the scope of self-medication practices and uncover potential predictors of unsafe analgesic use.

- Literature review:

Analgesics are among the most often used drugs in the world due to their ability to effectively relieve pain, lower temperature, and manage common symptoms like headaches and menstrual cramps, (7,8)Non-steroidal anti-inflammatory medications (NSAIDs), paracetamol, and in certain situations even opioids are examples of over-the-counter (OTC) analgesics that are commonly obtained without a doctor's supervision, raising concerns about abuse and dependence. According to studies, there are currently 1.6 million people who are addicted to painkillers specially opioids, underscoring the significant public health cost of analgesic abuse.(9)

Easy access and the belief that over-the-counter drugs are intrinsically safe are common causes of misuse. Research indicates that most over-the-counter (OTC) analgesics are bought straight from pharmacies and drugstores with little to no expert supervision. Long wait times, discontent with official healthcare institutions, and the notion that mild ailments don't need medical attention are some of the variables associated with this tendency. People often self-medicate as a result, which raises the possibility of improper dosage, drug interactions, and long-term reliance.

Analgesic abuse is common among athletes as well as the general public. According to research, athletes may use analgesics prophylactically to improve performance or endure rigorous training, even in the absence of discomfort. According to one study, a significant percentage of runners engaged in risky analgesic practices, frequently taking painkillers without seeking medical advice—sometimes using two NSAIDs at once, which greatly raises the risk of cardiovascular, gastrointestinal, and renal problems. These risky practices were shown to be mostly caused by a lack of expert medical advice and a lack of knowledge about possible negative effects. These results highlight the

necessity of focused educational initiatives encouraging sports populations to use analgesics more safely.(10)
The complexity of analgesic usage and abuse is further demonstrated by emergency departments (EDs). More than half of all ED visits are caused by complaints of pain, making it the most common symptom reported. Opioids are still useful for treating acute pain in emergency situations, but using them can have major side effects, including as respiratory depression, suppression of the central nervous system, nausea, vomiting, constipation, tolerance, dependence, and misuse potential. The increasing burden of opioid-related consequences, such as overdose and mortality, is a result of these dangers.(2)
Overall, research shows that accessibility, safety misunderstandings, patient education gaps, and institutional or cultural hurdles in healthcare are the main causes of analgesic abuse. Misuse has far-reaching effects, impacting not just people with acute or chronic pain but also certain subgroups like sports. Developing evidence-based policies, educational initiatives, and clinical interventions targeted at encouraging safe analgesic practices and lowering the dangers connected with inappropriate use requires an understanding of these patterns.

Despite these findings, most available studies focus on specific populations or healthcare settings, and few have simultaneously assessed awareness, risky practices, and sociodemographic predictors at the community level in Sudan. This gap highlights the need for localized evidence to guide public health interventions and regulatory strategies.

- Research Questions
What are the patterns of analgesic use among adults in the Dongola locality, Sudan?
What is the level of public awareness of the adverse effects of commonly used analgesics?
What risky practices are associated with analgesic use among adults?
Is there an association between sociodemographic factors and awareness of analgesic adverse effects?
Is awareness level associated with risky analgesic-use practices?

- Research Hypotheses

Null Hypotheses (H_0)

There is no association between public awareness of analgesic adverse effects and patterns of analgesic use.

Sociodemographic characteristics are not associated with awareness of analgesic adverse effects.

Awareness level is not associated with risky analgesic-use practices.

Alternative Hypotheses (H_1)

Public awareness of analgesic adverse effects is associated with patterns of analgesic use.

Sociodemographic characteristics are associated with awareness of analgesic adverse effects.

Lower awareness levels are associated with risky analgesic-use practices

2. **Justification**

Promoting safe drug consumption and avoiding medication-related damage requires evaluating the patterns and dangerous behaviors of analgesic use as well as raising public knowledge of their negative consequences. The results of this study will give baseline information on community attitudes on the use of analgesics in the Dongola area, which can direct the creation of successful health education initiatives and legislation.
Moreover, this study will benefit future research and public health initiatives by filling the knowledge gap in Sudan about self-medication habits and painkiller abuse.
Pharmacists, medical professionals, and legislators may utilize the findings as a guide to raise public awareness, promote safe medication usage, and tighten laws governing the sale of over-the-counter drugs.
The study can assist in developing focused interventions to lower the risks of self-medication and avoid consequences from overuse by determining factors associated with unsafe analgesic use, thereby improving public health outcomes

3. **Objectives**

3.1. General objective:

To assess public awareness of the adverse effects of analgesics, patterns of use, and risky practices among adults in Dongola locality, Sudan.

3.2. Specific objectives:

1. To determine the frequency and patterns of analgesic use among adults in Dongola locality.

2. To identify the most commonly used types and sources of analgesics.

3. To assess the level of public awareness regarding adverse effects of analgesics.

4. To identify risky practices related to analgesic use.

5. To examine associations between analgesic-use patterns, awareness levels, and sociodemographic characteristics.

4. **Methodology**

4.1. Study Design:

This study is a community-based cross-sectional design to assess patterns and risky practices of analgesic use, as well as public awareness of their adverse effects among adults in Dongola locality, Northern State, Sudan.

4.2. Study Area:

The study will be conducted in Dongola locality, Northern State, Sudan. Dongola is the capital of the Northern State and consists of urban and surrounding rural areas. The area is ideal for researching self-medication practices and public awareness since over-the-counter drugs, particularly analgesics, can be accessed easily through pharmacies and unlicensed retailers.

4.3. Study Population:
The study population will include adult residents above 18 years and living in Dongola locality.
Inclusion criteria:
1. Adults aged >18 years
2. Willing to participate and provide informed consent

Exclusion criteria:
1. Visitors or temporary residents
2. Individuals unable to respond to the questionnaire due to severe illness or cognitive impairment

4.4. Sample Size Determination:
The sample size was calculated using the standard formula for single population proportion:

$n = (z^2\ p(1 - p))/d^2$

Where:
•
Z = 1.96 (95% confidence level)
•
p = 0.5 (assumed prevalence)
•
d = 0.05 (margin of error)

The calculated minimum sample size was 385 participants.

4.5. Sampling Technique:
A convenience random sampling technique will be used. Questionnaires will be distributed to eligible participants in different areas of Dongola locality. Participation will be voluntary, and each participant will fill out the questionnaire independently.

4.6. Data Collection Tool:
Data will be collected using a structured self-administered questionnaire developed based on relevant literature in addition to direct interview via trained data collectors. The questionnaire includes sections on:
• Sociodemographic characteristics• Patterns of analgesic use
• Risky practices related to analgesic use
• Awareness of adverse effects
• Attitudes toward analgesic use
• Medical history

The questionnaire will be prepared in clear, simple language to ensure easy understanding.

4.7. Data Collection Procedure:
Data collection will be carried out by distributing questionnaires directly to participants.
Participants will complete the questionnaires without interviews and Completed questionnaires will be collected for analysis.

4.8. Study Variables:

Dependent variables:
• Risky analgesic use practices
• Level of awareness of adverse effects
Independent variables:
• Age, sex, educational level
• Type and frequency of analgesic use
• Source of analgesics
• Medical history

4.9. Data Management and Analysis:

The collected questionnaires will be exported into SPSS for analysis.
• Descriptive statistics will be used to summarize data.
• Chi-square tests will assess associations between variables.
• Logistic regression analysis will identify predictors of risky analgesic use.

Statistical significance will be set at $p < 0.05$.

4.10. Ethical Considerations:

Ethical approval will be obtained from the relevant ethics committee before commencement of the study.

Participation will be entirely voluntary. All participants will receive a Participant Information Sheet explaining the objectives of the study, the voluntary nature of participation, their right to withdraw at any time without any consequences, and contact information for the researcher.

Written informed consent will be obtained from all participants before participation.

No personal identifiers will be collected. All information will be treated confidentially and used solely for research purposes.

Electronic data will be stored in password-protected files accessible only to the principal investigator and the academic supervisor. Any printed materials will be stored in a secure location. Study findings will be presented in aggregate form without identifying individual participants.

Because the study includes questions about the adverse effects of analgesics, participants will be provided with a brief educational leaflet on the safe use of analgesics after completing the questionnaire.

5. **References**

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6. **Appendices**

استبيان

هذا الاستبيان جزء من رسالة الماجستير بكلية الطب والعلوم الصحية – جامعة دنقلا، ويهدف إلى دراسة أنماط استخدام المسكنات والممارسات المرتبطة بها ومستوى الوعي بآثارها الجانبية في محلية دنقلا.

المشاركة في هذه الدراسة طوعية بالكامل، ويحق لك رفض المشاركة أو الانسحاب في أي وقت دون أي تبعات.

لن يتم جمع أي معلومات تعريفية شخصية، وستظل جميع البيانات سرية تمامًا، ولن تستخدم إلا لأغراض البحث العلمي.

قد تتضمن بعض الأسئلة معلومات عن الآثار الجانبية للمسكنات، وسيتم تزويد المشاركين بمعلومات صحية مختصرة حول الاستخدام الآمن للمسكنات بعد إكمال الاستبيان.

الباحثة الرئيسية:
إسراء متوكل
كلية الطب والعلوم الصحية – جامعة دنقلا

☐
أوافق على المشاركة في الدراسة

القسم
االول: الخصائص الديموغرافية

1. العمر (بالسنوات):
☐ 18–25
☐ 26–35
☐ 36–45
☐ >45

الجنس.2
ذكر☐
أنثى☐

مكان الاقامة .3
حضري☐
☐
ريفي

4. الحالة االجتماعية:
☐
أعزب
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متزوج
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مطلق
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أرمل
5.

:المستوى التعليمي
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ثانوي
☐
جامعي
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دراسات عليا

6.
:المهنة
طالب☐
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موظف
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عمل حر
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7.
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10.
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مرات
:االستخدام
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يوميا
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عدة مرات
أسبوعيا
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أسبوعيا
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أقل من مرة
أسبوعيا
مدة
االستخدام
:المعتادة في كل مرة

دواعي
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):اختر كل ما ينطبق

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حمى
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االسنان
آالم□
الدورة
بعد□
العمليات
أخرى□:

القسم
الثالث:
الممارسات الخطرة
Index)

Practices

(Risky

14.
أستخدم
المسكنات بدون استشارة طبية
□
دائما
□

غالبا
□

أحيانا
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نادرا
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أبدا

15.
أتجاوز الجرعة الموصى بها عند عدم تحسن
االلم
□
دائما
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غالبا
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أحيانا
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نادرا
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أبدا
16.

أستخدم أكثر من
نوع مسكن في
نفس
الوقت
□
دائما
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غالبا
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أحيانا
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نادرا
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أبدا
17.

أكرر استخدام
نفس المسكن

لفترات طويلة
☐
دائما
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غالبا
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أبدا
18.
أستخدم المسكنات مع
معدة فارغة
☐
دائما
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غالبا
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أحيانا
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نادرا
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أبدا
19.
أستخدم المسكنات مع أدوية
أخرى دون معرفة
التداخالت
☐
دائما
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غالبا

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أحيانا
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نادرا
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أبدا
والوعي المعرفة :الرابع القسم (Knowledge & Awareness Scale)
20.
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في استخدام المسكنات قد يسبب تلف
الكبد
أوافق بشدة□
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أوافق
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غير متأكد
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ال أوافق
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ال أوافق
بشدة
21.

المسكنات
قد
تسبب
قرحة أو نزيف
المعدة
أوافق بشدة□
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أوافق
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غير متأكد
□
ال أوافق
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ال أوافق
بشدة
22.

االستخدام المزمن
للمسكنات
قد يؤدي إلى
فشل
كلوي
أوافق بشدة☐
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أوافق
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غير متأكد
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ال أوافق
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ال أوافق
بشدة
23.
بعض
المسكنات
ترفع ضغط الدم
أوافق بشدة☐
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غير متأكد
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ال أوافق
بشدة
24.
يمكن أن تحدث تداخالت خطيرة بين
المسكنات وأدوية أخرى

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25.
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الطبيب
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أوافق بشدة
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بشدة
26.
أقرأ النشرة
الداخلية
قبل استخدام أي
مسكن

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غالبا
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أحيانا
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نادرا
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أبدا
27.

ألتزم
بالجرعات
الموصوفة حتى مع استمرار األلم
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دائما
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غالبا
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أبدا
28.
أعتقد أن المسكنات أدوية آمنة
تماما
أوافق بشدة□
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محايد
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ال أوافق
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ال أوافق بشدة
القسم
:السادس
مصادر
المعلومات والتثقيف
الصحي
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المصدر الرئيسي لمعلوماتك
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عن مخاطر
المسكنات؟
.30
نعم□
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القسم السابع: االستعداد للتغيير
والتوصيات
هل
ترغب في تلقي
برامج
توعوية حول

االستخدام
اآلمن
للمسكنات؟

ما رأيك في أفضل
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31.
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االجتماعي

شكرا لمشاركتكم القيّمة

Educational leaflet :

المسكنات من أكثر الأدوية استخدامًا، وعند استخدامها بالطريقة الصحيحة تكون فعالة وآمنة، ولكن الاستخدام الخاطئ أو المفرط قد يؤدي إلى مشكلات صحية.

إرشادات مهمة:

* استخدم المسكنات وفق الجرعة الموصى بها.
* لا تتجاوز الجرعة المحددة حتى لو استمر الألم.
* تجنب استخدام أكثر من نوع من المسكنات في الوقت نفسه دون استشارة طبيب أو صيدلي.
* قد يؤدي الاستخدام المتكرر أو لفترات طويلة إلى مشكلات في المعدة أو الكبد أو الكلى.
* أخبر طبيبك أو الصيدلي عن أي أدوية أخرى تستخدمها لتجنب التداخلات الدوائية.
* استشر الطبيب إذا استمر الألم أو تكرر بشكل متكرر.

الاستخدام الواعي للمسكنات يساعد على الاستفادة منها بأمان ويقلل من مخاطرها المحتملة.

مع تمنياتنا لكم بدوام الصحة والعافية.