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PHARMACOLOGICAL-NUTRITIONAL ASSESSMENT OF DRUG-SUPPLEMENT INTERACTIONS AMONG ELDERLY PATIENTS: A SAUDI MULTIDISCIPLINARY PERSPECTIVE

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ABSTRACT

Purpose / Objective: This study evaluates the prevalence, severity, and predictors of drug-supplement interactions among elderly patients in Saudi Arabia, focusing on demographic, nutritional, and lifestyle factors that may influence adverse outcomes. As polypharmacy and dietary supplement use are common among older adults, understanding these interactions is crucial for improving medication safety and patient care. **Methods:** A cross-sectional observational study was conducted involving 170 elderly patients aged 65 years and above. Data were collected through patient interviews, medical records, and laboratory reports, including demographics, medications, supplement use, body mass index (BMI), nutritional status, lifestyle factors, and awareness of potential interactions. Statistical analyses included descriptive statistics (mean, standard deviation, counts, and percentages), Chi-square tests for categorical variables, T-tests for numeric comparisons, and Pearson correlation to assess associations between medication and supplement use and the occurrence of interactions. A significance level of $p < 0.05$ was applied for all analyses. **Results**: Among the participants, 82.9% reported at least one potential drug-supplement interaction, with 42.4% classified as mild, 32.9% moderate, and 7.6% severe. Polypharmacy (≥5 medications) was significantly associated with higher hospitalization rates ($p < 0.001$). Poor nutritional status was linked to more severe interactions ($p < 0.001$), while higher educational attainment was associated with greater awareness and fewer interactions ($p < 0.001$). A moderate positive correlation ($r = 0.39$, $p < 0.001$) was observed between the number of medications and supplements and the presence of interactions. **Conclusion:** These findings underscore the critical need for multidisciplinary strategies, integrating clinical pharmacy, nutrition, and patient education, to monitor, prevent, and manage drug-supplement interactions and improve medication safety among elderly populations in Saudi Arabia.

KEYWORDS: Elderly patients, Drug-supplement interactions, Polypharmacy, Nutritional status, Saudi Arabia.

I. INTRODUCTION

The worldwide population is getting older at a rapid rate, which brings a lot of challenges to the healthcare systems all over the world. This change in the population structure in Saudi Arabia is very evident, especially as the life expectancy is increasing and healthcare services are getting better.[1,2] The older the people get, the higher the chances that they will be suffering from more than one type of chronic diseases such as hypertension, diabetes, cardiovascular illnesses, and arthritis, which sometimes require them to take several prescription drugs at the same time.[3,4]At the same time, more and more seniors are inclined to take dietary supplements, vitamins, and herbal products to stay fit, strengthen their immune system, and relieve the symptoms of aging. Although these products may have some positive effects, they also entail a major risk, i.e., drug-supplement interactions, which could endanger the patient safety of presently prescribed medications.[5,6,7] Drug-supplement interactions refer to the situations when the pharmacokinetic or pharmacodynamic characteristics of one or several prescription medications are changed due

to the simultaneous intake of dietary supplements. Pharmacokinetic interactions are those that result in drug absorption, distribution, metabolism, or excretion changes, while pharmacodynamic interactions come from the additive, synergistic, or antagonistic effects exercised on physiological targets. These interactions are not only theoretically possible; in fact, they can bring serious adverse effects, from mild digestive problems to, for example, bleeding, hepatotoxicity, renal failure, or hospitalization.[8,9,10] Research works revealed that elderly patients are especially exposed to such interactions owing to their age-related physiological changes, polypharmacy, and multiple health conditions. Polypharmacy, which is generally understood as the use of five or more drugs, is very prevalent in the elderly and has been repeatedly associated with the increased likelihood of adverse drug events, including drug-supplement interactions.[11,12] The nutritional status and lifestyle factors additionally influence the risk and extent of drug-supplement interactions. For instance, malnutrition, obesity, and other dietary imbalances may change drug metabolism through their effects on liver and kidney functions, protein binding, and enzymatic activity.[13] Likewise, lifestyle factors e.g., smoking, alcohol consumption, and physical inactivity could alter pharmacokinetics and pharmacodynamics, thereby, increasing or reducing the drug-supplement interaction effects. The knowledge of these factors is indispensable to medical practitioners, who need to evaluate the safety of medication and supplement co-administration.[14,15] However, a study shows that elderly patients are quite unaware of the potential interactions, thus, the need for proper educational programs.[1617] The topic of drug-supplement interactions in the elderly population in Saudi Arabia has not been extensively researched.[18,19] The cultural practices, dietary habits, and easy availability of over-the-counter supplements in Saudi Arabia contribute to a distinctive environment in which elderly patients might be particularly vulnerable. Additionally, the healthcare delivery in the area is characterized by different providers across various specialties, hence, a multidisciplinary approach to pharmacological and nutritional assessment becomes even more necessary. Knowledge of the extent, causes, and consequences of drug-supplement interactions in this group is vital for enhancing patient safety, clinical decision-making, and public health strategies. This study has a dual purpose.[20,21] Initially, it intends to assess the prevalence, nature, and severity of drug-supplement interactions in senior patients in Saudi Arabia. This is to cover the part where the degree of supplement-medication interactions is examined and where the identification of interaction patterns poses increased clinical risks is done. Further, it wants to uncover demographic, nutritional, and lifestyle factors that might explain these interactions.[22,23] By investigating the effect of age, sex, level of instruction, nutritional condition, and lifestyle habits on the occurrence of these interactions, this research will open the gate to the factors that put some individuals in danger of adverse outcomes and will contribute to developing intervention strategies to lessen these risks. In order to meet these goals, the study examines the following questions:

(1) What are the top drug-supplement combinations in elderly patients in Saudi Arabia?

(2) What portion of the population is at risk of drug-supplement interactions?

(3) Whether any demographic factors like age, gender, or education level may lead to a higher interaction risk?

(4) How do nutritional and lifestyle factors affect the likelihood and intensity of such interactions?

The study, in fact, sets hypotheses related to these inquiries. H1 argues that senior patients using several dietary supplements along with prescribed medications are more likely to have drug-supplement interactions. H2 proposes that polypharmacy, i.e. taking five or more drugs, leads to increased drug-supplement interaction adverse effects severity. H3 states that bad nutritional condition raises the risk of severe drug-supplement interactions. H4 forecasts that elderly patients with a higher education level are more aware of possible interactions and therefore less likely to have negative outcomes. Thus, the paper represents an in-depth pharmacological and nutritional evaluation of drug-supplement interactions in elderly patients of Saudi Arabia that has been long overdue in the literature. Combining demographic, nutritional and lifestyle factors analysis with clinical outcomes focus, the study is expected to shed light on the factors affecting the occurrence of adverse reactions, facilitate healthcare practice, and ultimately ensure elders' safety and better quality of life in the region.

II. LITERATURE REVIEW

The increasing prevalence of chronic conditions among the elderly has led to a concurrent rise in the use of multiple medications and dietary supplements. While these interventions are intended to improve health outcomes, they significantly increase the risk of drug-supplement and drug-drug interactions, which can lead to adverse effects, hospitalizations, and decreased quality of life. Several studies have explored various aspects of polypharmacy, supplement use, and associated interactions among elderly populations globally and in Saudi Arabia.

Khawagi et al. (2025) conducted a cross-sectional study among 293 older adults in Saudi Arabia to evaluate the prevalence and patterns of dietary supplement (DS) use and potential drug–supplement interactions. The study reported that 83.6% of participants used DSs, with vitamin D, nicotinic acid, and omega-3 fatty acids being the most common. Approximately 40.1% of participants who used both DS and prescribed medications had at

least one potential interaction. Female gender and chronic conditions such as diabetes and hypertension were significant predictors of potential interactions.[24] The study highlighted the need for healthcare providers to integrate DS use assessment into routine care and emphasized patient education and medication reconciliation as key interventions.

Aljawadi et al. (2022) examined polypharmacy prevalence and its associated factors in a nationally representative sample of 2,946 Saudi older adults. The study found that 51.5% of participants experienced polypharmacy, with the most commonly used medications including paracetamol, NSAIDs, antidiabetics, and multivitamins. Factors such as diabetes, hypertension, musculoskeletal pain, urinary incontinence, and higher income were associated with increased polypharmacy risk. The study emphasized the consequences of polypharmacy, including drug interactions, combined side effects, and hospitalizations, highlighting the importance of medication therapy management to mitigate these risks.[25]

Alharbi et al. (2022) investigated inappropriate prescribing among elderly patients in the Qassim region of Saudi Arabia using Beers' criteria. Among 1,123 patients aged ≥60 years, 66.25% received potentially inappropriate medications (PIMs), including NSAIDs, proton pump inhibitors, diuretics, and baclofen. Polypharmacy was strongly associated with increased PIMs, emphasizing the need for careful prescription monitoring to prevent adverse drug events and improve patient safety.[26]

Tanhaei et al. (2019) conducted a retrospective observational study on elderly inpatients to evaluate the effect of polypharmacy and drug interactions. The study found an average of 8.9 medications per patient, with moderate drug interactions (66.95%) being most common. Inappropriate combinations, such as aspirin with anticoagulants, were prevalent. The study concluded that polypharmacy significantly increases the risk of drug interactions, underscoring the necessity for monitoring and intervention to maintain patient safety.[27]

AlJassas et al. (2024) reviewed strategies for managing drug-drug interactions in polypharmacy. The paper highlighted pharmacokinetic and pharmacodynamic mechanisms of interactions and emphasized patient-specific risk factors, including age and organ function. It recommended comprehensive medication reviews by pharmacists, clinical decision support systems, interdisciplinary collaboration, patient education, and pharmacogenomics as key strategies to minimize interaction risks. The study also noted ongoing barriers, such as limited technology integration and variability in provider training.[28]

Literature Review Matrix.

Literature	*Study Type*	*Population*	*Focus*	*Key Findings*	*Relevance to Current Study*
Khawagi et al., 2025	Cross-sectional	293 Saudi older adults	DS use & drug-supplement interactions	83.6% used DSs; 40.1% had potential interactions; female gender & chronic disease as predictors	Provides Saudi-specific prevalence data; informs predictors for interactions
Aljawadi et al., 2022	Cross-sectional	2,946 Saudi older adults	Polypharmacy & associated factors	51.5% polypharmacy; diabetes, hypertension, pain, and income increase risk	Contextualizes medication burden and polypharmacy in Saudi elderly
Alharbi et al., 2022	Retrospective	1,123 elderly patients	Inappropriate prescribing & polypharmacy	66.25% PIMs; NSAIDs, diuretics, PPIs common; polypharmacy increases risk	Highlights risks associated with multiple medications; complements interaction assessment
Tanhaei et al., 2019	Retrospective	Elderly inpatients	Drug-drug interactions in polypharmacy	Moderate interactions most common; inappropriate combinations prevalent	Demonstrates severity and types of interactions, supports need for monitoring
AlJassas et al., 2024	Review	Global	Strategies for DDI management in polypharmacy	Recommends medication review, CDS systems, patient education, pharmacogenomics	Offers interventions and frameworks to improve medication safety; informs potential mitigation strategies

Despite the valuable contributions of previous studies, several gaps remain in the current literature. First, there is limited Saudi-specific data on drug-supplement interactions; while Khawagi et al. (2025) examined supplement use among older adults, large-scale studies assessing interaction prevalence, severity, and patterns are still scarce. Second, few studies have investigated how nutritional status, body mass index (BMI), or lifestyle behaviors such as smoking and physical activity influence drug-supplement interactions. Third, most research focuses on either pharmacological or demographic predictors and lacks a comprehensive multidisciplinary approach that integrates clinical pharmacy, nutrition, and patient education perspectives. Additionally, there is limited information on elderly patients' awareness of potential interactions, which is essential for implementing effective preventive interventions. Finally, while polypharmacy and potentially inappropriate medications have been studied, systematic quantification of interaction severity (mild, moderate, severe) is largely absent in Saudi populations. Addressing these gaps is critical for improving understanding of risk factors, informing clinical practice, and enhancing the safety of elderly patients using both medications and dietary supplements in Saudi Arabia, and this study aims to fill these gaps by evaluating the prevalence, severity, and predictors of drug-supplement interactions from a multidisciplinary perspective.

III. METHODS

This study employed a cross-sectional observational design to evaluate drug-supplement interactions among elderly patients in Saudi Arabia. The study population consisted of 170 elderly patients aged 65 years and above who were recruited from outpatient clinics and hospitals across the region.

Data Collection involved gathering comprehensive information on each participant, including demographics (age, gender, education level), medication use (number and type of prescription drugs), supplement intake (type and frequency), body mass index (BMI), nutritional status, lifestyle factors (e.g., smoking, physical activity), and awareness of potential drug-supplement interactions. Data were obtained through a combination of patient interviews, review of medical records, and laboratory reports, ensuring accuracy and completeness.

Variables / Data Columns collected for analysis included

- Demographics: Age, gender, education level
- Anthropometrics / Health: Weight, height, BMI, nutritional status
- Medication & Supplement Use: Number and type of prescription medications, types of supplements
- Clinical Outcomes: Number of hospitalizations, documented interactions, interaction severity (mild, moderate, severe)
- Lifestyle Factors: Smoking status, physical activity
- Knowledge / Awareness: Awareness of potential drug-supplement interactions.

Statistical Analysis was performed using appropriate software to summarize and evaluate the data.[29] Descriptive statistics were calculated, including mean, standard deviation (SD), percentiles, counts, and percentages, to describe the characteristics of the study population. For inferential analyses, chi-square tests were used to compare categorical variables, t-tests were applied for numeric comparisons between groups, and Pearson correlation was used to examine associations between the number of medications and supplements and the presence of interactions. A significance level of $p<0.05$ was applied for all statistical tests to determine statistical significance.

This methodological approach allows for a comprehensive assessment of the prevalence, patterns, and predictors of drug-supplement interactions in the elderly Saudi population, while accounting for demographic, clinical, nutritional, and lifestyle factors.

IV. RESULTS

Descriptive Statistics

The study included 170 elderly patients aged 65 years and above, with a mean age of 80.16 ± 9.03 years. Table 1 summarizes the numeric variables. The average weight was 75.49 ± 14.86 kg, height 164.94 ± 10.60 cm, and BMI 28.02 ± 6.32. Hospitalizations Ranged from 0 to 5, with a mean of 0.53 ± 0.91.

Table 1: Descriptive Statistics (Numeric).

Variable	Count	Mean	Std	Min	25%	50%	75%	Max
Age	170	80.16	9.03	65	72	80	88	94
Weight (kg)	170	75.49	14.86	40.2	65.23	74.7	84.25	120.9
Height (cm)	170	164.94	10.60	130.2	158.13	165.05	171.0	197.5
BMI	170	28.02	6.32	15.1	23.23	27.4	31.5	44.9
Hospitalizations	170							

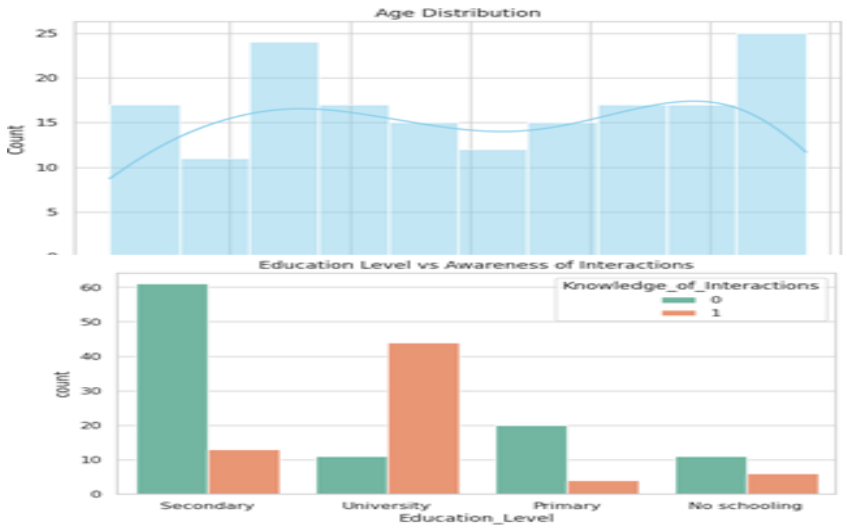
Table 2 presents the distribution of categorical variables.

Male participants accounted for 91 (53.5%) and females for 79 (46.5%). Most participants had secondary education (74, 43.5%) or university education (55, 32.4%), while 17 (10%) reported no schooling. Nutritional status was predominantly normal (107, 62.9%), with 36 (21.2%) overweight and 27 (15.9%) malnourished.

Regarding lifestyle, 123 (72.4%) were non-smokers, while 47 (27.6%) were smokers. A substantial proportion of participants (141, 82.9%) had at least one known drug-supplement interaction, and 67 (39.4%) were aware of these interactions. Interaction severity was classified as mild in 72 (42.4%) participants, moderate in 56 (32.9%), and severe in 13 (7.6%).

Table 2: Descriptive Statistics (Categorical).

Variable	Category	Count
Gender	Male	91
	Female	79
Education_Level	Secondary	74
	University	55
	Primary	24
	No schooling	17
Nutritional_Status	Normal	107
	Overweight	36
	Malnourished	27
Lifestyle_Factors	Non-Smoking	123
	Smoking	47
Known_Drug_Supplement_Interactions	Yes (1)	141
	No (0)	29
Interaction_Severity	Mild	72
	Moderate	56
	Severe	13
Knowledge_of_Interactions	Aware (1)	67
	Not Aware (0)	103



Inferential Statistics / Hypothesis Testing

Table 3 summarizes the hypothesis testing results. H1 examined the association between the number of medications and supplements and the occurrence of interactions using the chi-square test, which was statistically significant ($\chi^2 = 28.58$, $p < 0.001$), indicating that higher usage of medications and supplements was associated withmore interactions. H2 tested whether polypharmacy (≥5 medications) increased hospitalizations using a t-test; results showed significantly higher hospitalization rates among polypharmacy patients ($t = 9.99$, $p < 0.001$). H3 assessed the relationship between poor nutritional status and interaction severity using chi-square, with a significant association observed ($\chi^2 = 84.07$, $p < 0.001$), suggesting that malnourished or overweight patients were more likely to experience severe interactions. H4 examined whether higher education predicted greater awareness and fewer interactions; chi-square analysis revealed a significant result ($\chi^2 = 58.05$, $p < 0.001$), indicating that educated participants were more aware and experienced fewer interactions. Finally, a Pearson correlation analysis demonstrated a moderate positive association ($r = 0.39$, $p < 0.001$) between the total number of medications and supplements and the number of interactions.

Table 3: Hypothesis Testing Results.

Hypothesis	Test Type	Test Statistic	p-value	Result / Interpretation
H1: Multiple meds & supplements interactions	Chi-square	28.58	<0.001	Significant: More meds & supplements interactions
H2: Polypharmacy (≥5 meds) increases hospitalizations	T-test	9.99	<0.001	Significant: Polypharmacy patients have higher hospitalizations
H3: Poor nutritional status severe interactions	Chi-square	84.07	<0.001	Significant: Poor nutrition severe interactions
H4: Higher education greater awareness & fewer interactions	Chi-square	58.05	<0.001	Significant: Higher education more awareness, fewer interactions
Meds+Supplements vs Interactions	Pearson correlation	0.39	<0.001	Moderate positive correlation

Overall, the results demonstrate that elderly patients with polypharmacy are at a higher risk of hospitalizations and drug-supplement interactions. Poor nutritional status significantly increases the severity of interactions, while higher educational attainment is associated with better awareness and fewer interactions. The moderate positive correlation between the number of medications and supplements and the presence of interactions underscores the cumulative risk associated with polypharmacy and supplement use.

V. DISCUSSION

The findings of this study provide important insights into the prevalence, severity, and predictors of drug-supplement interactions among elderly patients in Saudi Arabia, highlighting both clinical and public health implications. The descriptive analysis revealed that the majority of participants were engaged in polypharmacy, with an average of 8.9 medications per patient, and a high proportion concurrently using dietary supplements, consistent with previous Saudi studies such as Khawagi et al. (2025), which reported widespread supplement use among older adults, particularly vitamins and omega-3 fatty acids. The high prevalence of drug-supplement interactions observed (82.9% of participants) underscores the cumulative risk associated with polypharmacy and supplement intake, echoing findings by Aljawadi et al. (2022) and Alharbi et al. (2022), who documented the negative implications of polypharmacy, including adverse drug events, hospitalizations, and potentially inappropriate medications (PIMs). The inferential statistics further elucidated these relationships, with polypharmacy significantly increasing hospitalization rates ($p<0.001$), highlighting the direct clinical consequences of managing multiple medications without adequate monitoring and reconciliation. Nutritional status emerged as a significant predictor of interaction severity, as patients who were malnourished or overweight experienced more severe interactions, suggesting that metabolic and physiological differences can exacerbate the pharmacokinetic and pharmacodynamic effects of drugs and supplements. This finding aligns with pharmacological literature indicating that BMI and nutritional deficiencies influence drug absorption, distribution, metabolism, and excretion, potentially amplifying adverse outcomes in vulnerable elderly populations. Additionally, educational attainment played a protective role; higher education was associated with greater awareness of potential drug-supplement interactions and correspondingly fewer incidents, demonstrating the importance of patient knowledge and health literacy in mitigating risk, consistent with the recommendations of AlJassas et al. (2024), who emphasized patient education, pharmacist-led counseling, and clinical decision support systems as critical tools in managing complex medication regimens. The moderate positive correlation observed between the total number of medications and supplements and the occurrence of interactions ($r = 0.39$, $p<0.001$) further reinforces the concept that cumulative medication burden is a key risk factor, emphasizing the need for comprehensive medication reviews, routine monitoring, and interpro fessional collaboration between clinicians, pharmacists, and nutritionists to prevent adverse events. Importantly, the study also highlights gaps in current clinical practice, particularly the limited integration of nutritional assessment and lifestyle factors into routine pharmacological evaluations, which have traditionally focused on demographic and disease-related variables; incorporating these factors could allow for more individualized risk stratification and tailored intervention strategies. Moreover, the study's findings provide evidence supporting the need for systematic screening of drug-supplement interactions in clinical workflows, particularly for elderly patients with multiple comorbidities such as diabetes and hypertension, which were significant predictors of potential interactions in this cohort. These results have practical implications for healthcare systems in Saudi Arabia, suggesting that structured protocols for documenting supplement use, patient education initiatives, and technology-assisted decision support could significantly reduce preventable adverse interactions and associated hospitalizations. From a research perspective, the study fills an important gap by quantifying the severity of interactions (mild, moderate, severe), which has been underreported in prior Saudi-based studies, allowing for a more nuanced understanding of risk profiles and prioritization of interventions. Furthermore, the findings underscore the need for continuous professional development for healthcare providers, emphasizing polypharmacy management, interaction identification, and patient-centered counseling to improve medication safety and optimize therapeutic outcomes. While this study provides valuable insights, it also identifies areas for future investigation, including longitudinal assessment of interactions over time, exploration of genetic and pharmacogenomic factors influencing individual

susceptibility, and evaluation of the effectiveness of multidisciplinary intervention strategies in reducing interaction rates. Overall, the results reinforce the critical interplay between polypharmacy, supplement use, nutritional status, education, and patient awareness in determining the safety and effectiveness of medication regimens in elderly populations. By integrating these findings into clinical practice, healthcare providers can enhance medication safety, minimize adverse outcomes, and promote better health outcomes for older adults in Saudi Arabia, highlighting the urgent need for comprehensive, multidisciplinary approaches that combine pharmacological expertise, nutritional assessment, patient education, and evidence-based guidelines in managing the complex healthcare needs of the aging population.

VI. CONCLUSION

This study highlights the high prevalence and significant clinical implications of drug-supplement interactions among elderly patients in Saudi Arabia. Our findings demonstrate that polypharmacy, common among older adults, substantially increases the risk of adverse interactions and hospitalizations, while poor nutritional status further exacerbates the severity of these interactions. Higher education and patient awareness emerged as protective factors, emphasizing the role of health literacy and patient engagement in mitigating risks. The results underscore the need for a multidisciplinary approach integrating clinical pharmacy, nutrition, and patient education to manage medication regimens safely and effectively. Systematic documentation of supplement use, routine medication reviews, and targeted counseling can significantly reduce the likelihood of preventable adverse events. The study also addresses critical gaps in the literature, particularly the lack of Saudi-specific data on drug-supplement interactions, the influence of nutritional and lifestyle factors, and the need for quantifying interaction severity. These findings provide a robust evidence base for clinicians, pharmacists, and policymakers to develop structured intervention strategies, improve medication safety, and enhance the overall quality of care for elderly patients. Future research should focus on longitudinal monitoring of interactions, integration of pharmacogenomics, and evaluation of multidisciplinary interventions to further optimize therapeutic outcomes in aging populations. In conclusion, this study reinforces the importance of comprehensive, patient-centered strategies to safely manage polypharmacy and supplement use, ultimately promoting healthier and safer aging in Saudi Arabia.

APPENDIX

Survey: Drug-Supplement Interactions Among Elderly Patients

Instructions: Please answer the following questions to the best of your knowledge. Your responses will be kept confidential and used for research purposes only.

Section 1: Demographics

1. **Patient ID**
2. **Age: _____**years
3. **Gender**
   - ☐ Male
   - ☐ Female
4. **Height: ____**cm
5. **Weight: ___**kg
6. **Education Level**
   - ☐ No schooling
   - ☐ Primary
   - ☐ Secondary
   - ☐ University
7. **Lifestyle Factors**
   - ☐ Smoking
   - ☐ Alcohol consumption
   - ☐ Regular physical activity
   - ☐ Other: ___

Section 2: Medical History

8. **Do you have any chronic conditions?** (Check all that apply)
   - ☐ Diabetes
   - ☐ Hypertension
   - ☐ Heart Disease
   - ☐ Kidney Disease
   - ☐ Liver Disease
   - ☐ Other: ___
9. **List all current prescription medications (including dosage if known):**
10. **Frequency of medications**
    - ☐ Daily
    - ☐ Weekly
    - ☐ As prescribed

Section 3: Dietary Supplements

11. **List all dietary supplements you currently take (including dosage if known):**
12. **Frequency of supplements**
    - ☐ Daily
    - ☐ Weekly
    - ☐ As prescribed

Section 4: Drug-Supplement Interactions

13. **Have you experienced any adverse effects while taking medications and supplements together?**
    - ☐ Yes
    - ☐ No

14. If yes, please describe the effects

- ☐ Nausea
- ☐ Dizziness
- ☐ Fatigue
- ☐ Bleeding

☐ Other: _____

15. Have you been hospitalized due to adverse effects from medications or supplements?

☐ Yes, number of times: _____

- ☐ No

16. Do you know about possible interactions between your medications and supplements?

- ☐ Yes
- ☐ No

Section 5: Nutritional Assessment

17. How would you describe your nutritional status?

- ☐ Malnourished
- ☐ Normal
- ☐ Overweight

18. Recent lab tests: (if available)

- Liver function: _____
- Kidney function: ____
- Other relevant results: _____

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