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Impact of Patient Education and Lifestyle Adherence on Functional Outcomes after Total Hip Arthroplasty in Moroccan Context

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I. Abstract

Original Research Article

Background: The success of total hip arthroplasty (THA) relies on surgical precision and patient adherence to postoperative safety guidelines. In the Moroccan context, traditional habits (floor prayer, Turkish toilets) challenge standard protocols. This study evaluates the impact of patient education on lifestyle adherence and functional outcomes. ***Methods:*** A retrospective study (2021–2023) was conducted, including 67 patients (70 hips). Evaluations utilized the PMA, WOMAC, and Parker scores. A specific questionnaire analyzed the quality of information received and actual lifestyle habits at the final follow-up. ***Results:*** The mean age was 57.1 years. Functional improvement was significant, with the mean PMA score increasing from 6.28 to 14.4 ($p < 0.001$). Despite a 100% satisfaction rate, adherence was low: 79% used traditional toilets and 36% performed floor prayers. Illiteracy (68%) and low socioeconomic status (82%) were major barriers to adherence. ***Conclusion:*** THA restores excellent function despite low adherence to Western-style lifestyle precautions. Culturally adapted patient education is necessary to bridge the gap between medical advice and daily reality.

Keywords: Total Hip Arthroplasty, Patient Education, Cultural Adaptation, Lifestyle Adherence, Functional Outcomes.

II. INTRODUCTION

Total Hip Arthroplasty (THA) is generally recognized as the "operation of the century," a testament to its revolutionary power to restore mobility, reduce chronic pain, and improve health-related quality of life for millions of patients globally [1, 11]. Since the pioneering work of Sir John Charnley, the evolution of prosthetic design, bearing surfaces, and surgical procedures has achieved a degree of maturity that ensures high implant survivorship and predictable clinical results in typical populations [12].

However, the long-term effectiveness of THA is not just a function of surgical precision; it is profoundly linked with the patient's commitment to postoperative "hygiene and lifestyle" standards [2]. These guidelines are routinely applied to limit the risk of prosthesis dislocation—a severe complication that remains the leading cause of early revision surgery, with documented occurrences ranging from 1% to 5% in primary cases [3]. Standard precautions often necessitate strong postural constraints, including the avoidance of hip hyperflexion beyond 90°, adduction across the midline, and extremes of internal or external rotation depending on the surgical method [14].

While these safety norms are well-established in Western healthcare systems, their application in developing countries, notably in North Africa, presents substantial socio-anthropological and economic problems [4]. In Morocco, the socioeconomic situation sometimes renders traditional Western advice, such as the usage of higher toilet seats or specific housing modifications, financially unaffordable for a considerable proportion of the population [1].

Furthermore, daily living in the Moroccan environment involves unique "high-demand" mechanical chores that are profoundly anchored in cultural and religious traditions. Chief among these is the Islamic ceremonial prayer (Salat), which involves repetitive cycles of deep squatting, kneeling, and sitting on the floor—movements that necessitate hip flexion considerably surpassing the accepted safety criteria [10]. Additionally, the frequent use of traditional "Turkish" toilets demands forced hyperflexion and a degree of joint stability that standard postoperative guidelines are supposed to prohibit.

Despite these possible mechanical conflicts, there is a dearth of actual data addressing how these cultural behaviors effect the functional stability of

current implants in the Maghreb region. There is a growing worry that current patient education methods, sometimes directly adapted from European models, may be culturally and linguistically ill-suited for people with high illiteracy rates and diverse domestic ergonomic demands [15].

Therefore, the purpose of this retrospective study was to examine the clinical and functional results of a cohort of Moroccan patients who received THA. Specifically, we aimed to analyze the gap between the preoperative information delivered and actual postoperative lifestyle adherence, while assessing whether non-conformity to standard "hip-safe" rules in this specific socio-cultural context leads to increased complication rates or compromised functional recovery.

III. MATERIALS AND METHODS

3.1. Study Design: A retrospective, descriptive, and analytical study was conducted at the Ibnou Tofail University Hospital in Marrakech (January 2021 to October 2023).

3.2. Population: We included 67 patients (70 hips). Inclusion required a minimum follow-up of 6 months and complete medical records. Exclusion criteria included cognitive impairment or loss to follow-up.

3.3. Evaluation: Clinical Assessment used the Postel-Merle d'Aubigné (PMA) score [6], functional assessment used the WOMAC Index [7], and autonomy used the Parker score [8]. A multidimensional questionnaire evaluated adherence at the final follow-up.

IV. RESULTS

4.1. Demographic and Clinical Profile

The study population consisted of 67 patients (70 hips) with an equal gender distribution (34 males, 33 females). The mean age at the time of surgery was 57.1 years (range: 22–92 years). Notably, the cohort was younger than typical Western series, with 35% of patients aged under 50. Socioeconomic vulnerability was prominent: 82% lived in low-income conditions, and 68% were illiterate. The mean duration of symptoms prior to surgery was 3.4 years, reflecting significant delays in access to care [1].

4.2. Etiology and Surgical Data

Primary indications included primary osteoarthritis (30%), femoral neck fractures (24%), and femoral head avascular necrosis (21%). Secondary osteoarthritis (DDH or trauma sequelae) accounted for 25%. Surgeons utilized the Hardinge lateral approach in 72% of cases and the Moore posterior approach in 27% [5]. Regarding fixation, 55% were cemented and 45% were cementless.

4.3. Functional Outcomes and Autonomy

Functional improvement was statistically significant across all scales ($p < 0.001$):

- **PMA Score:** Increased from a mean preoperative 6.28 ± 1.5 to 14.4 ± 2.1. The pain component improved from 1.8 to 5.2, and walking from 2.1 to 4.8. Overall, 67% achieved a "Very Good" result.
- **WOMAC Index:** The mean score decreased from 88 to 30.1 points, indicating a substantial reduction in joint stiffness and impairment.
- **Parker Score:** The mean postoperative score was 7.8/9, with 62% reaching the maximum score of 9/9, signifying full outdoor autonomy.

4.4. Information Quality and Lifestyle Adherence

While 95% of patients recalled receiving oral preoperative education, a significant "compliance gap" was observed when transitioning to the domestic environment:

- **Toilet Facilities:** Despite standardized advice to use seated toilets, 79% of patients used traditional Turkish toilets. Of these, 92% cited the financial impossibility of modifying their home infrastructure as the primary reason for non-adherence.
- **Religious Practices:** At six months post-surgery, 36% of patients had resumed floor-based prayer (*Sujud* and *Joulous* positions), requiring hip flexion exceeding 110°.
- **Home Environment:** Only 12% of the cohort successfully implemented safety modifications, such as grab bars or the removal of floor rugs to prevent falls.
- **The Literacy Factor:** A statistically significant correlation ($p < 0.05$) was found between illiteracy and the inability to identify "at-risk" movements during the 6-month clinical follow-up.

4.5. Complications and Satisfaction

The global satisfaction rate was 100% (75% "Very Satisfied," 25% "Satisfied"). Complications were minimal: one case of prosthetic dislocation (1.4%) occurred following an accidental fall, and two cases of superficial surgical site infection (2.8%) were successfully resolved with oral antibiotics. No cases of deep vein thrombosis or pulmonary embolism were recorded.

V. DISCUSSION

The clinical success of Total Hip Arthroplasty (THA) is traditionally measured by implant longevity and the absence of complications, particularly dislocation. However, in emerging healthcare systems, success must also be measured by the patient's ability to return to essential cultural and religious activities. This study highlights a fundamental "compliance paradox": the achievement of excellent functional outcomes despite

a systemic failure to adhere to postoperative safety guidelines.

5.1. Functional Recovery: The "Revenge" of the Severe Hip

The most striking finding in our series was the magnitude of functional improvement. The mean PMA score increased by over 8 points (from 6.28 to 14.4), a gain significantly higher than those reported in European registries [12]. In many Western series, THA is performed as an elective procedure when the PMA score drops below 11 or 12. In contrast, our cohort presented with "locked hips" and severe preoperative disability.

This suggests that in the Moroccan context, THA acts as a "salvage" procedure that effectively "catches up" with extreme joint destruction. However, this late intervention often entails chronic peri-articular muscle atrophy. While our functional scores were excellent, the long-term stability of these implants may be more dependent on the secondary stability provided by muscle rehabilitation, which remains a challenge in low-resource settings.

5.2. The Socioeconomic Determinants of Non-Adherence

Our data reveals a significant "Compliance Gap": while 95% of patients recalled receiving oral instructions, 79% continued to use traditional Turkish toilets.

- **Economic Barriers as Medical Contraindications:** For 82% of our cohort, the "standard" medical advice to install raised toilet seats or grab bars was financially impossible. In this context, standard postoperative guidelines are not merely medical advice; they are socioeconomic filters. Non-adherence here is not a result of patient negligence but a reflection of environmental constraints.
- **The Literacy Barrier:** With a 68% illiteracy rate, the traditional reliance on written discharge brochures is clinically ineffective. Our results indicate that oral information fades as patients return to ancestral domestic habits. This necessitates a shift toward visual, gesture-based education—teaching patients how to move safely within their existing environment rather than demanding they change it [15, 18].

5.3. Floor-Level Activities: A Real-World Stability Test

The resumption of floor-based prayer (*Salat*) by 36% of our patients represents a significant biomechanical challenge. The positions of prostration (*Sujud*) and the seated posture between prostrations (*Joulous*) require extreme hip flexion and varying degrees of rotation that often exceed the theoretical 90-110° safety limit of standard protheses.

Despite this, our dislocation rate remained remarkably low (1.4%). We hypothesize several contributing factors:

1. **The Surgical Approach:** The Hardinge lateral approach, used in 72% of our cases, preserves the posterior capsule and external rotators. This provides a "posterior safety envelope" that may tolerate deep flexion better than the posterior Moore approach [5, 16].
2. **Biological Pre-conditioning:** Patients raised in a "floor-sitting culture" may possess inherent capsulo-ligamentous flexibility and proprioceptive memory that protects the joint during deep flexion, even after arthroplasty.
3. **Large-Diameter Femoral Heads:** The widespread use of 32mm and 36mm heads increases the "jump distance"—the distance the head must travel to escape the cup—thereby reducing the risk of dislocation during impingement in deep flexion.

5.4. Shifting toward "Culturally Competent" Patient Education

Current orthopedic education is often a direct translation of Western protocols. Our study argues for a "Culturally Competent" model. Instead of banning floor prayer—a command often ignored due to spiritual necessity—surgeons and physiotherapists should:

- **Demonstrate "Safe Flexion":** Use visual modeling to show patients how to sit and rise by keeping the operated leg in a neutral or slightly extended position.
- **Utilize "Family-Centered" Education:** In the Moroccan social structure, the family is the primary caregiver. Education must target the patient's relatives to ensure home-made, low-cost modifications are implemented.
- **Digital and Visual Tools:** Given the literacy gap, smartphone-based video tutorials and pictograms are far superior to printed text for ensuring long-term retention of safety rules [15].

5.5. Limitations and Future Perspectives

This study is limited by its retrospective design and relatively short follow-up period. While we observed high satisfaction and low dislocation, we cannot yet account for the impact of high-flexion activities on polyethylene wear or osteolysis over a 10-to-15-year period. A prospective study utilizing automated radiographic analysis to measure wear rates in "floor-active" patients would be the necessary next step to validate the safety of these cultural practices.

VI. CONCLUSION

The results of this study demonstrate that Total Hip Arthroplasty (THA) is a highly effective operation within the Moroccan population, giving great pain relief and restoring functional independence even in patients presenting with severe joint degeneration. However, a

large "compliance gap" occurs between standardized postoperative medical instructions and the daily circumstances of the patients.

Our findings show that traditional high-flexion activities—such as floor-based prayer and the use of Turkish toilets—are not merely "habits" but are deeply embedded in the socioeconomic and spiritual fabric of the region. The surprisingly low dislocation rate reported, despite widespread non-adherence to traditional Western procedures, questions the universality of existing "hip-safe" standards. It implies that current prosthetic stability, particularly when combined with lateral surgical methods and large-diameter femoral heads, may be more adaptable to cultural mobility patterns than previously anticipated.

Consequently, a paradigm shift in postoperative management is essential for North African and similar emerging environments. We advocate for the transition from a "prescriptive" paradigm of education to a "culturally competent" therapeutic alliance. This strategy should stress visual and kinesthetic learning over written materials to overcome literacy hurdles, integrate the family unit as a main support system for home ergonomics, and emphasis on "safe movement adaptation" rather than outright ban.

Ultimately, the goal of THA is to restore the patient to their individual environment. By aligning surgical success with cultural authenticity, orthopedic surgeons can ensure that the "operation of the century" remains accessible and effective for diverse global populations, ensuring long-term implant survival without compromising the patient's quality of life or spiritual practice.

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