



DAILY CALCIUM INTAKE IN A SMALL COHORT OF FEMALE LONG-TERM CARE RESIDENTS

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INTRODUCTION

- Calcium is an important mineral obtained through diet and supplementation that contributes to the strength of bone.
- Poor calcium consumption may result in osteoporosis, a disease of poor bone quality that affects 54% of the adult population ages 50 and older.¹
- Each year 800,000 aging adults are hospitalized due to ground level falls resulting in a cost of fifty-billion-dollars of healthcare dollars; much of which is spent on the consequences of fractures.²
- Residents of long-term care facilities are known to have poor bone quality and are at especially high risk for osteoporotic fractures.
- Few studies exist estimating the average daily calcium consumption of aging adults residing in long-term care facilities.
- Total daily nutritional intake of calcium should be considered when developing risk mitigation strategies for fragility fractures.

METHODS

- LECOM Senior Living Center is a long-term and skilled nursing facility located in Erie, Pennsylvania.
- Inclusion Criteria: female residents of the facility 50 years of age and older at the beginning of data collection. Residents, who were determined by the director of nursing to be cognitively capable of understanding the survey, physically able to complete the survey, and willing to participate, were selected.
- Data collected included de-identified seven-day dietary calcium journals, demographic information (age, gender), and total amount of prescribed daily calcium supplementation.
- The dietary survey was designed with the assistance of the facility's registered dietician, allowing for easy notation of portion sizes and available food options.
- Completed food diaries were audited by the director of nursing prior to being provided to the researchers to assure protection of participant anonymity.
- Average daily calcium intake (ADCI) was calculated from dietary intake, supplementation, and total calcium intake per day.

RESULTS

- Ten female residents successfully completed seven days of calcium intake recordings.
- None of the long-term care residents consumed a daily calcium consumption of 1200 mg through diet alone.
- Four of the ten female residents reached the daily recommended calcium intake for women over the age of fifty through diet and supplementation.
- The highest reported calcium intake was 1524 mg daily.
- The lowest average daily calcium consumption was 16 mg.
- Three residents received a 1200 mg calcium supplement once daily and one resident received a 600 mg once daily supplement.
- Most reported dietary source of calcium was milk, containing 276-299 mg of calcium per each 8-ounce serving.

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Average Daily Calcium Intake (ADCI)

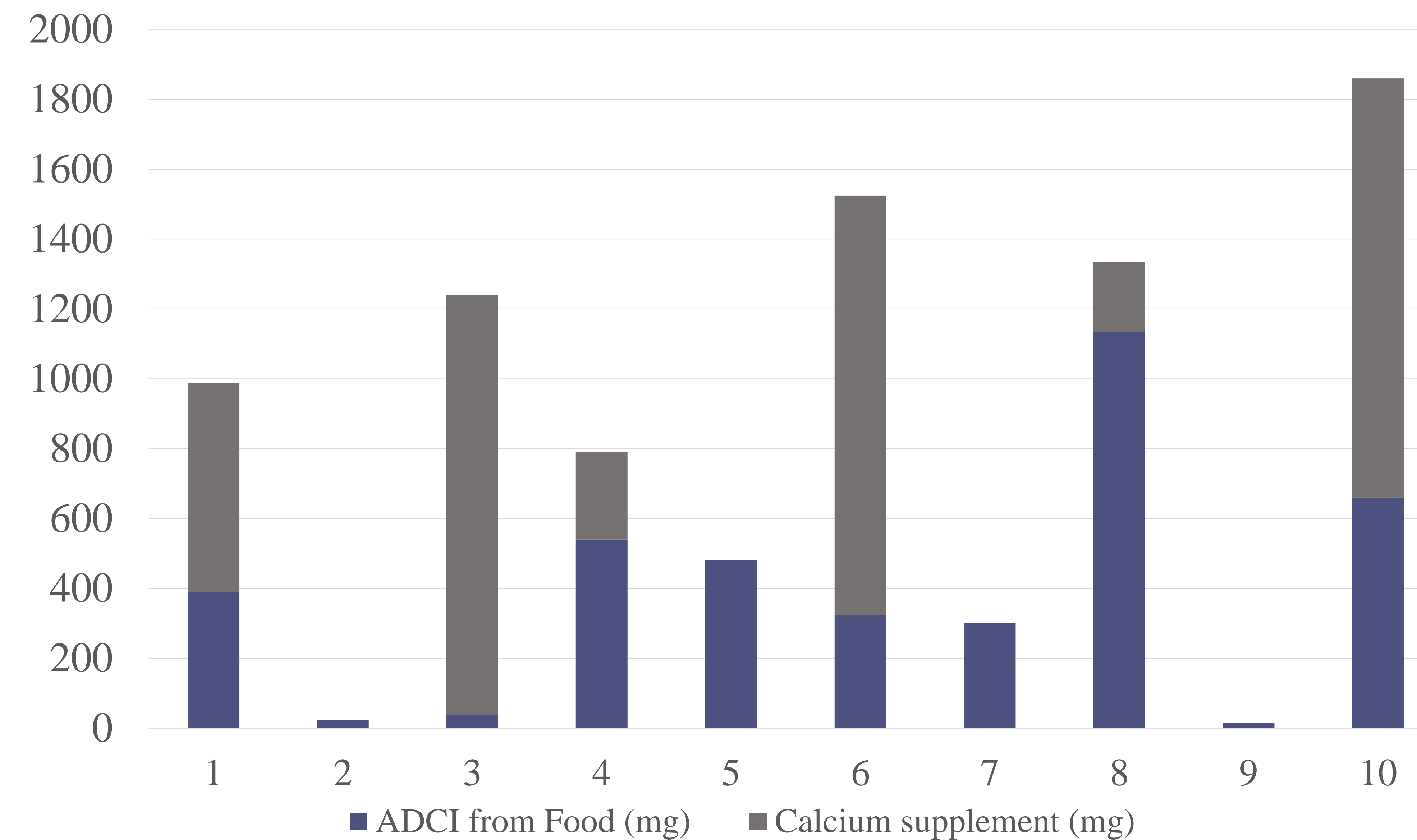


Figure 1. Breakdown of Average Daily Calcium Intake. Every resident was below the recommended 1200 mg intake for women over 50 years of age when analyzing dietary consumption alone. In combination with supplementation, four patients met or exceeded the recommended daily intake of calcium.

Patient	ADCI Total (mg)
1	989
2	24
3	1239
4	790
5	480
6	1524
7	301
8	1235
9	16
10	1860

Table 1. Total Average Daily Calcium Intake. This chart demonstrates the average daily calcium intake per resident over the course of seven days. Only four patients met or exceeded 1200 mg per day.

DISCUSSION

- None of the surveyed female residents of the LECOM SLC consumed through diet alone, the total recommended daily calcium intake for women over the age of fifty.
- Despite 6 of the 10 female residents receiving prescribed calcium supplementation, only 40% of residents consumed the daily calcium recommendation of 1200 mg.
- Our findings are consistent with prior studies that have reported that most long-term care residents are deficient in daily calcium consumption.³ In addition, this demographic is known to have low rates of supplement use, specifically calcium supplementation.^{4,5} Calcium prescribing in this demographic should be overseen by a physician. Potential side effects of calcium supplementation may include, gas, bloating, and constipation¹⁰, conditions this demographic is already prone to. Additional risk include calcium oxalate renal stone formation; but this has only been documented in supplementation amounts greater than 2000mg daily.¹⁰
- Standardizing calcium supplementation on admission to long-term care facilities may be an opportunity to improve rates of supplementation. Prior studies have shown the addition of just 500 mg of calcium per day may reduce postmenopausal bone loss in the lumbar spine.⁶
- Increased availability of calcium rich foods at meals in long-term care facilities has been shown to increase the daily consumption of calcium in comparison to controls.⁷ Based on the robust availability of calcium rich dietary options on the LECOM SLC menu, we did not see a large opportunity to boost calcium consumption through additional dietary offerings.
- A study of community-dwelling aging adult women demonstrated a significant increase in nutrient intake after receiving nutritional education in their homes.⁸ We are considering the opportunity to provide resident nutritional education programs to encourage consumption of calcium rich foods at mealtimes. A resident educational program has the potential to be a low cost and noninvasive intervention to improve calcium consumption and would allow residents to take an active role in their own care. A limitation of this intervention is its' applicability to only those residents cognitively capable of understanding the provided education and able to apply that information at mealtimes.
- We recognize limited ability to improve calcium consumption through resident directed education in those aging adults with cognitive decline; this should prompt further discussion and consideration for routine calcium supplementation in those residents with cognitive decline.
- Results of our present study will be utilized at the LECOM Senior Living Center to facilitate discussions amongst our clinical pharmacists, dietitians, and physicians regarding calcium supplementation standardization and auditing of calcium supplementation in current residents. Future research is planned to explore resident nutrition education.

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