

An Exploration of the Nutritional Management of Critically Ill Patients receiving Non-Invasive forms of Respiratory Support

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INTRODUCTION

Guidelines for the nutritional management in patients on Non-Invasive Ventilation (NIV) and High-Flow Nasal Cannula (HFNC) are limited, with evidence showing inadequate intake, mainly through oral feeding ⁽¹⁾.

This service evaluation examined nutrition practices in ICU and HDU for these patients, compared to those on Invasive Mechanical Ventilation (IMV), and assessed malnutrition prevalence in patients on non-invasive respiratory support.

METHODS

Retrospective data was collected from adult patients admitted to critical care between 2022 and 2024, including 100 on NIV/HFNC and 100 on IMV, all requiring ≥ 7 days of respiratory support.

Data assessed:

- Nutrition Route
- Nutrition adequacy at days 7 and 14
- Nutrition delivery barriers
- Malnutrition rates in NIV/HFNC group

RESULTS

1. Patient Demographics

	NIV/HFNC	IMV
Age	Mean age 66.85 (range 28-91) ✓ More aged 80-90 years ($p=0.0005$) ✓ Less aged 30-39 years ($p=0.0126$) ✓ Less aged 40-49 years ($p=0.0124$)	Mean 55.13 (range 16-82)
Gender	75% male, 25% female	51% male, 49% female
Speciality	75% medical, 25% surgical	49% medical, 51% surgical

Figure 1: Age, Gender and Speciality

2. Nutrition Routes

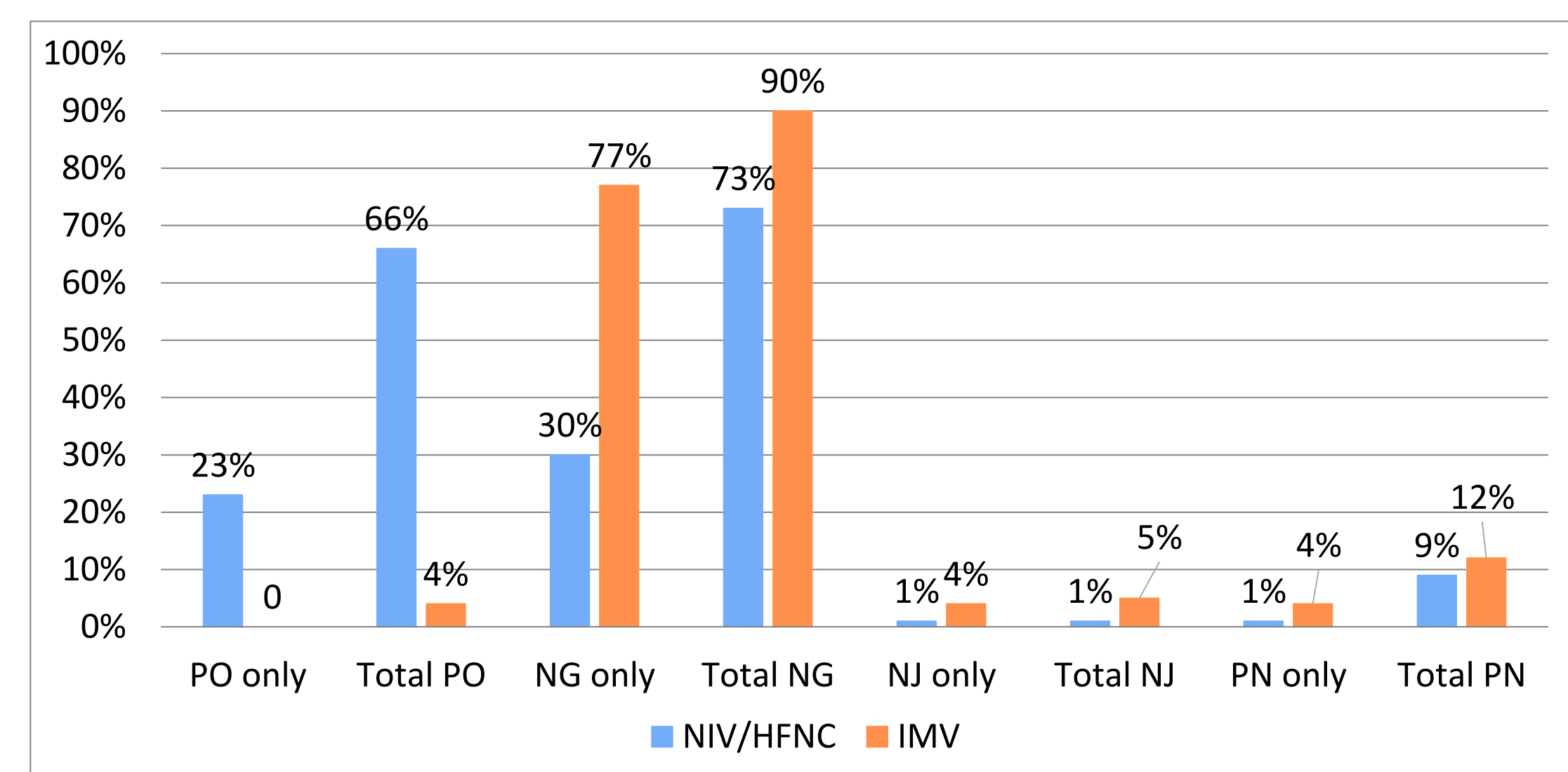


Figure 2: Nutrition routes of NIV/HFNC and IMV patients

NIV/HFNC patients:

- NG feeding was most common (73%), followed by oral intake (66%)
- Oral intake was higher vs IMV ($p < 0.0001$); NG feeding was lower ($p < 0.002$)
- Subgroup analysis (NIV/HFNC): Patients without prior IMV had lower NG feeding rates than those with prior IMV (60% vs 94%; $p = 0.0003$)

3. Nutrition Adequacy

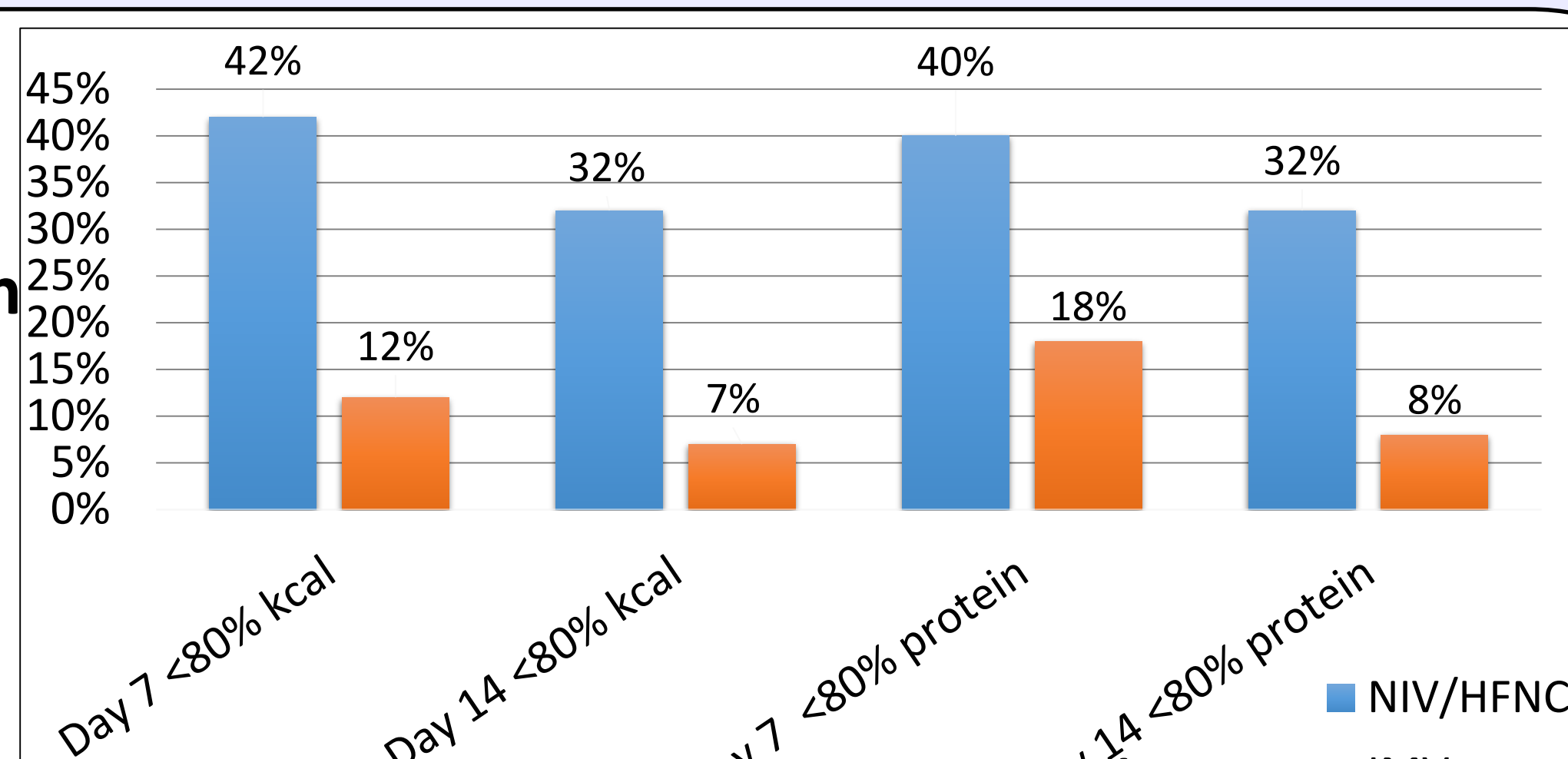


Figure 3: Nutrition adequacy of NIV/HFNC and IMV patients

- **Day 7:** 42% (42/100) NIV/HFNC vs 12% (12/100) IMV patients met <80% kcal requirements ($p < 0.0001$)
40% (40/100) NIV/HFNC vs 18% (18/100) IMV patients met <80% protein requirements ($p = 0.0006$)
- **Day 14:** 32% (6/19) NIV/HFNC vs 7% (5/68) IMV patients met <80% kcal requirements ($p = 0.0004$)
32% (6/19) NIV/HFNC vs 8% (6/68) IMV patients met <80% protein requirements ($p = 0.0008$)

4. Nutrition Barriers

	NIV/HFNC	IMV
Day 7	• Poor oral intake • Titration of feeding due to refeeding risk • NG removal by patients	• High Gastric Residual Volumes (GRVs) • Haemodynamic instability • Fasting for procedures
Day 14	• Poor oral intake • NG removal by patients	• High GRVs • NG removal

Figure 4: Nutrition delivery barriers in NIV/HFNC and IMV patients at day 7 and day 14

5. Malnutrition in NIV/HFNC Patients

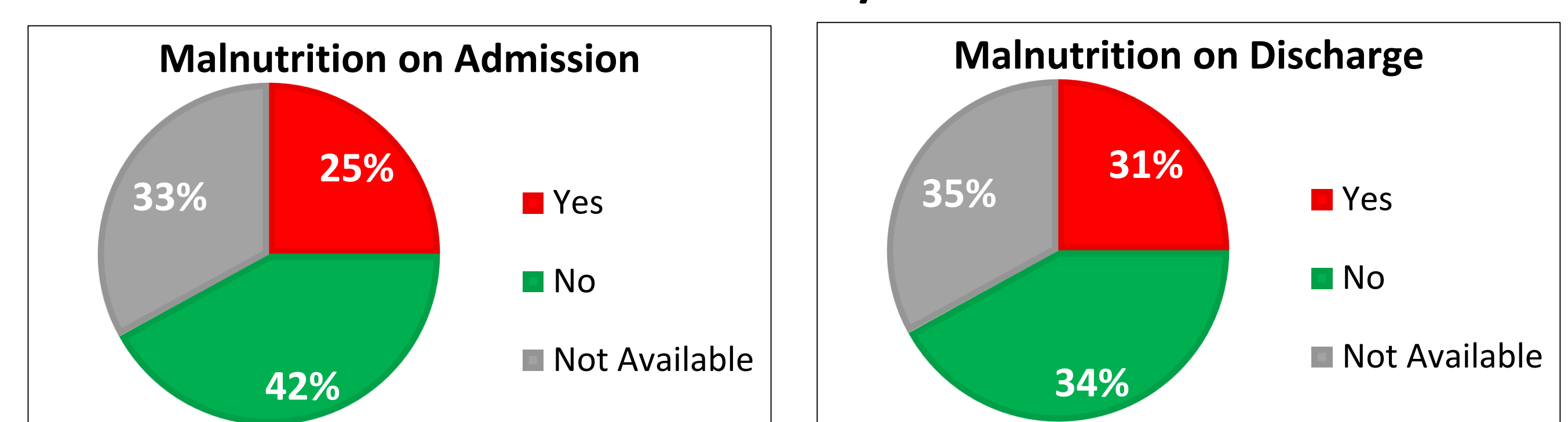


Figure 5: Malnutrition status on admission and discharge in NIV/HFNC patients

CONCLUSION

NIV/HFNC patients are older, predominantly male and under medical specialities. These patients tend to receive more oral nutrition and less NG feeding than IMV patients. NG feeding was less common in NIV/HFNC patients who did not previously require IMV.

Overall, nutrition delivery is poorer in the NIV/HFNC cohort, likely related to oral intake being one of the main routes of nutrition.

Malnutrition increased in NIV/HFNC patients from admission to discharge from critical care, though the malnutrition status was unknown for many patients. Results limited by small sample size. Nutritional intake and malnutrition evaluation need improvement in this group.

References

1. Viner Smith, E., et al., 2022. Nutrition management for critically ill adult patients requiring non-invasive ventilation: a scoping review. *Nutrients*, 14(7), p.1446.
2. Weimann, A. et al., 2021. ESPEN practical guideline: Clinical nutrition in surgery. *Clinical Nutrition*, 40(7), pp.4745-4761.