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Abstract:	Objective(s): To describe referral source, meal ordering patterns, and the nutrient composition of meals from a regional Meals on Wheels (MOW) service. Methods: Referral sources were obtained via retrospective chart audit and compared for the years 2008 and 2012. Nutrient content of the three most common meal combinations were compared against the MOW recommendations of one third of daily energy and one half of daily protein requirements. Results: There was a decline in referrals from hospitals. The "main meal" alone was the most popular meal choice, but did not meet the energy requirements for men or women. The combination of a soup, main and dessert met the MOW recommendations for women only. Conclusion: The decline in referrals from hospitals indicates a need for improved referral systems. Further research into consumer preferences is required to better understand meal ordering patterns and to identify strategies to increase the nutrient content of meals.

RESEARCH

Meals on Wheels: Who's referring and what's on the menu?

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Objective: To describe referral source, meal ordering patterns and the nutrient composition of meals from a regional Meals on Wheels (MOW) service.

Methods: Referral sources were obtained via retrospective chart audit and compared for 2008 and 2012. Nutrient content of the three most common meal combinations was compared against MOW recommendations of one-third daily energy and one-half daily protein requirements.

Results: There was a decline in overall uptake and referrals from hospitals. The "main meal" alone was the most popular meal choice, but did not meet energy requirements for men or women, nor protein requirements for men. The combination of a soup, main and dessert met the MOW recommendations for women only.

Conclusions: Investigation into how older people access MOW services is required. Innovative strategies are required to increase the nutrient content of meals, within the context of meal ordering preferences of consumers.

KEYWORDS

aged, food services, Meals on Wheels, nutritional requirements, referral

1 | INTRODUCTION

The increasing numbers of people entering old age in Australia require shifts in the type of care available to keep older people living independently in the community for as long as possible. In line with the federal government's aged care reform package *Living Longer Living Better*,¹ a continuum of health-care and social services support for older people has evolved. These span from formal in-home support provided by governments or aged care providers to informal services provided by families, friends, community groups and volunteers.

In July 2015, the Australian Government launched its Commonwealth Home Support Program (CHSP), which streamlined four existing programs (Commonwealth Home and Community Care [HACC] Program; National Respite for Carers Program; Day Therapy Centres Program; and Assistance with Care and Housing for the Aged Program) into one. Access to the suite of in-home services can be made by a senior or their carer through the "My Aged Care" gateway.² Access to home meals delivery now also occurs through

this online platform. The change in processes required to access home care services has implications in the case of meal delivery to older adults in need. An evaluation of the performance of the MyAgedCare platform conducted in 2016 by the Department of Health identified an overarching sentiment from service providers that the platform had increased their workload rather than streamlining referral processes. Impact on the ability of frail older adults to access home-delivered meals services has not been adequately investigated.³

It is well documented that malnutrition is common in older adults admitted to hospital^{4,5} and those in residential aged care facilities.⁶ What is largely overlooked, however, is that the large proportion of nutritionally compromised older adults are discharged home,⁴ and it is this group that may be most in need of home meal delivery during their critical period of convalescence. Being in need of nutritious food and not being able to prepare it or access it is considered to be a state of food insecurity.⁷ Many older adults are considered to be food insecure, particularly those residing in rural areas.^{8,9} The Australian Institute of Family Studies has identified that "people who are disabled, unwell or frail" are susceptible to

food insecurity.¹⁰ In Australia, it is estimated that close to 5% of community-dwelling older people are malnourished, while a further 38% are categorised as being at risk of malnutrition.^{11–13} General practitioners (GPs) can play an important role in screening for food insecurity in this age group and referring to Meals on Wheels (MOW) and other meal delivery services.¹⁴

Meals on Wheels has been operating in Australia since 1952 and approximately 10 million meals are delivered annually to more than 50 000 recipients across the country, by more than 78, 000 volunteers. The organisation's philosophy is to provide a nutritious meal, in the context of social interaction that may reduce social isolation and loneliness, and this is reflected in their slogan "More than just a meal." Qualitative research with MOW clients confirms the social significance of the service.¹⁵ However, many older people in need of the service do not access it. This may, partly, be related to poor referral systems within the health-care system and from other community service providers¹⁶; however, this has not been formally investigated.

There is considerable variation across MOW organisations in Australia regarding the types of meals they offer and the way in which clients can order meals. For example, in some regions, clients are required to order all three components of the meal (soup, main and dessert), whereas in others there is greater flexibility in client meal choice that is offered. This presents a challenge to MOW services with regard to meeting nutritional guidelines for meals provided within their menu cycles. There is a paucity of research that identifies how clients' meal ordering patterns and selected combinations of meal components impact on their nutrient intakes. This is important because service providers and health-care professionals need to understand which meal choices are preferred in order to keep up to date with contemporary meal guidelines, and to respond to changing needs of their clientele.

To better understand these gaps in knowledge, a case study was conducted in a MOW service in Kiama, a regional town located 100 km south of Sydney, New South Wales (NSW) Australia. Kiama has a high proportion of older residents, with 23.5% of the population aged 65 years and older, most of whom live at home.¹⁷ The Kiama MOW service was established in 1970 in order to meet the needs of the large number of older patients being discharged from its major hospital. Clients are offered frozen or hot meals that are delivered from one to five days per week, depending on the client's request, and are ordered on a weekly or fortnightly basis. The service runs on a summer and winter menu cycle and offers 55 different choices of main meals and other food items including mini meals (200 g smaller serves), desserts, soups and juices.

This study aimed to: (a) describe referral patterns to MOW at two different time points over a four-year period (September 2008 and September 2012); (b) describe the meal ordering patterns of clients over a two-week recording

Policy Impact

Meals on Wheels (MOW) is a service offered within the Commonwealth Home Support Program in Australia to assist frail older adults living at home to obtain nutritious meals. The observed decline in referrals from hospital settings, and constantly low referral from General Practitioners (GPs) and community-based disability services across the period 2008 to 2012 indicates that further advocacy and marketing of MOW to these sources of referral is required. Timely referral will better meet the needs of older people living in the community, particularly during convalescence after a hospital discharge.

Practice Impact

In a single MOW service in regional NSW, ordering patterns of clients indicated that many recipients order only the main meal, rather than the three courses offered by the service. Strategies are required to increase the protein and energy content of the main meal component, in order to meet nutritional requirements of the target audience.

period; and (c) to assess the protein and energy content of the five most commonly ordered meals from the service during September 2012.

2 | METHODS

In consultation with the manager of the service of Kiama MOW, a retrospective chart audit was undertaken. Criteria for eligibility of clients include those entitled to HACC and who resided in the Kiama local government area. Consumer information regarding source of referral to the service (ie friends/family, self, hospitals, GPs or an assessment team) was obtained from a computer-based card-file system using de-identified data and compared for the years 2008 and 2012. This study was approved by the University of Wollongong Human Research Ethics Committee (Ethics Approval Reference Number: HE14/138).

In this MOW service, a paper-based menu is provided to clients and order is entered by MOW staff into a spreadsheet. For the purpose of this study, menu order forms were collated for a two-week period during September 2012 to determine the top five menu items ordered within each of the following food categories: soups; main meals; mini meals; and desserts. Meals are purchased by MOW from external providers, and

the nutritional content of the meals is displayed on menu labels. The nutrient content data were provided from the three external food providers to Kiama MOW, thus allowing the researchers to assess the nutrient content of the top five menu items ordered within each food category (eg soup, main and dessert). Microsoft Excel (2007) was used to determine the mean energy and protein contributions of the five most common menu items ordered and the three most common meal combinations.

Average energy and protein content of the three most common meal combinations were compared to the NSW MOW Nutritional Guidelines of one-third of the daily requirement for energy and one-half of the daily requirement for

protein.¹⁸ Daily energy requirements were determined using the Schofield equation for adults aged >60 years.¹⁹ The nutrient reference values for protein in men and women aged >70 years were used.²⁰

All data were de-identified prior to analyses. Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS version 15 for Windows, 2006, SPSS Inc, Chicago, IL, USA). Data cleaning was conducted using SPSS to establish any outliers. One sample *t* tests were performed to determine any statistical differences between the three most common meal combinations and the NSW MOW nutrition guidelines¹⁸ regarding protein and energy content. A *P*-value of <0.05 was used as statistical significance.

TABLE 1 Sociodemographic characteristics of clients enrolled in the Kiama Meals on Wheels service: 2008 and 2012

Characteristics	January–November 2008 (average)	September 2008 (%)	September 2012 (%)
Total number of clients (n)	106	113	90
Sex			
Male	41	38	34
Female	59	62	66
Age (years)			
30–50	0	0	1
51–60	1	1	3
61–70	5	4	6
71–80	32	34	10
81–90	58	57	52
>90	4	4	28
Status			
Frail/aged	88	89	87
Carer	2	2	2
Dementia	4	4	3
Disability	6	5	8
Living arrangements			
Alone	63	65	80
Spouse/partner only	35	33	16
Other relatives	2	2	4
Other specify	0	0	0
Referral agents			
Friends/family	30	32	39
Self	24	23	33
HACC	9	5	1
Hospital-public	12	12	9
Hospital-private	10	10	1
General practitioner	9	10	10
ACAT	5	6	0
Disability service	0	0	2
Other	1	1	5

ACAT, Aged Care Assessment Team; HACC, Home and Community Care.

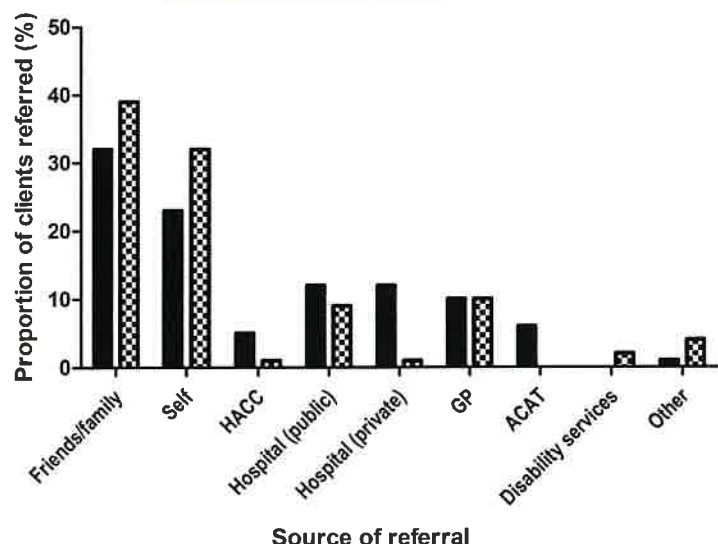


FIGURE 1 Proportion of clients referred to Kiama Meals on Wheels from different sources in September 2008 and 2012. ACAT, Aged Care Assessment Team; HACC, Home and Community Care services ■ Sep-08, ▨ Sep-12

3 | RESULTS

Table 1 shows the total number of consumers, on average, who were enrolled in the service during the year of 2008, and also compares figures for the months of September 2008 ($n = 113$) and September 2012 ($n = 90$). During September 2008, the majority of clients were female (62%), aged between 71 and 90 years (91%), and living alone (65%). Similar trends were found for the overall year of 2008, as well as for the month of September 2012.

The majority of Kiama MOW consumers in September 2008 had been referred by family/friends (32%), followed by self-referrals (23%), public hospitals (12%), private hospitals (10%), GPs (10%), Aged Care Assessment Team (6%), HACC (5%) and other (1%) (Figure 1). Data for September 2012 indicated an increase in self-referrals (33%) and referrals from family and friends (39%), with a reduction in referrals from hospitals, as well as aged care community services. Referrals from disability services remained low across years.

Meal combinations ($n = 53$) ordered by consumers over a two-week period during September 2012 are shown in Table 2. The majority of consumers ordered main meals alone (53%), followed by main and dessert (21%), while soup, main and dessert were ordered by only nine per cent. The five most popular menu items ordered within the category of soups included pea and ham, pumpkin, chicken and vegetable, thick vegetable, and beef and vegetable. Main meals included roast pork, lamb or chicken with gravy, corned silverside and crumbed fish. Similarly for mini meals, crumbed fish and chips, roast beef and gravy and corned silverside were popular, as were cottage pie and sausages and gravy. The five

TABLE 2 The proportion (%) of the different meal combinations ordered by Kiama MOW clients in September 2012 ($n = 53$)

Meal order	Proportion of all clients (%)
Main only	53
Main and dessert	21
Soup, main and dessert	9
Main and soup	4
Main, dessert and juice	7
Main (mini meal)	2
Soup, main and juice	2
Soup, main, dessert and juice	2

most popular desserts were apricot pie and custard, chocolate mousse, apple pie and cream, sticky date pudding with caramel sauce and fruit salad.

The average main and dessert combination would meet the MOW NSW guidelines for energy for women, while the main, dessert and soup combination would meet both energy and protein guidelines for women. None of the combinations met recommended energy and protein guidelines for men (Table 3). Mean energy content of the five most common main meals was 1453 kJ (± 348), which was significantly lower than one-third of the estimated energy requirements for men (2885 kJ) and women (2350 kJ), at 17% and 21%, respectively. These meals provided, on average, 24.8 g (± 6.1) protein which was lower than the guideline of half of the daily protein requirements which equates to 40.7 g and 28.2 g per day for men and women, respectively. A significant difference was evident

TABLE 3 The nutrient content (energy and protein) of the three most common meal combinations (main meal, main and dessert, and main, dessert and soup) compared to the New South Wales Meals on Wheels nutritional recommendations

Meal combination	Mean nutrient content of meal		Estimated requirements from the NSW MOW recommendations ^{a,b}		% EE ^a or RDI ^b	P-value
Main	Energy (kJ)	1453	Men	2885 ^a	17	0.001*
			Women	2350 ^a	21	0.007*
	Protein (g)	25	Men	40.7 ^b	31	0.006*
			Women	28.2 ^b	44	0.326
Main and Dessert	Energy (kJ)	2344	Men	2885 ^a	27	0.001*
			Women	2350 ^a	33	0.967
	Protein (g)	27	Men	40.7 ^b	33	<0.001*
			Women	28.2 ^b	48	<0.001*
Main, dessert and soup	Energy (kJ)	2779	Men	2885 ^a	32	0.107
			Women	2350 ^a	39	0.001*
	Protein (g)	33	Men	40.7 ^b	41	<0.001*
			Women	28.2 ^b	59	<0.001*

MOW, Meals on Wheels; NSW, New South Wales.

* $P < 0.05$ statistically significant for comparison between nutrient content of meal and the MOW recommendation.

^aSchofield equation was used to determine the estimated energy requirements for older men and women. Men (aged >60 years) = $[(49 \times 76 \text{ kg} + 2.459) \times 1.4]$. Women (aged >60 years) = $[(38 \times 60 \text{ kg} + 2.755) \times 1.4]$. This value was multiplied by one-third to determine one-third energy RDI as stated by the MOW guidelines.

^bRDI for protein was derived from the nutrient reference values for Australia and New Zealand as indicated in the National Health Medical Research Council website. The protein RDI for men (aged >70 years) is 1.07 g/kg/day using 76 kg as the reference weight. The protein RDI for women (aged >70 years) is 0.94 g/kg/day using 60 kg as the reference weight.

for actual protein content compared to recommendations for men ($P = 0.006$).

4 | DISCUSSION

This case study of a regional NSW MOW service identified an overall decline in referrals to MOW between 2008 and 2012. Approximately half of the MOW consumers ordered main meals alone, which did not meet the NSW MOW nutrition guidelines which were based on three meal components. This is concerning because of the high risk of malnutrition in this group,¹¹ the causes of which may include poor appetite, a compromised health status, socioeconomic hardship, loneliness, bereavement and impaired mobility. Previous studies have confirmed that MOW clients are nutritionally compromised^{21,22}; therefore, early identification of nutritional risk through referral to a dietitian may be of benefit.

As reported in other studies,^{18,23} the majority of MOW consumers were women aged 71 years or older who lived alone. The impact of sex, marital status and living arrangements on the nutritional status of community living older adults has been documented by others.^{24,25}

Reasons for the decline in client numbers in a MOW service in regional Australia between 2008 and 2012 may be

related to low awareness about the service in older people, lack of referrals by health professionals or other negative perceptions around using the MOW service.¹⁶ The low numbers of referrals from GPs, compared to self-referrals and those from family members, may reflect a perception by GPs that nursing homes are better equipped than community-based services including MOW to provide care for chronically ill or frail older patients.¹⁶ However, this hypothesis is yet to be confirmed. Overall, the decline in referrals from hospital staff suggests a need for improved referral systems to MOW services and improved communication with hospital discharge planners and primary care practitioners in the catchment area. Other reasons for changes in referral patterns, such as increased provision of meal preparation assistance in home care packages, cannot be ruled out.

In other countries, novel models of care such as RED ("re-engineered discharge"), which focus on in-hospital patient education, comprehensive discharge planning and postdischarge telephone follow-up, are effective in improving patient outcomes.²⁶ Using a nurse discharge advocate plays a central role by improving communication, including requirements at home for meals assistance. The principles and components of RED have been adopted and recognised by the US National Quality Forum (2010) as one of their "Safe Practices".

In the MOW service that was investigated, clients order their meals a week in advance through a paper-based menu

system. Their choice of meals will determine the contribution of the home-delivered meals to overall nutrient requirements. Unlike some MOW services that require two or three courses to be ordered, the present service allows flexibility in choice. The finding that over half of the consumers ordered a main meal alone rather than combinations that included soup and/or a dessert suggests that nutritional recommendations for home-delivered meals may need revision to accommodate meal ordering practices. The nutritional guidelines for NSW MOW services at the time of the study were based on the premise that a meal comprises a soup, main meal and dessert. The guidelines stipulated that “a meal” should meet one-half of the estimated daily protein requirements and one-third of the estimated daily energy requirements.¹⁸ An earlier study from our group showed that meal packages, as ordered, provided 24% of daily energy requirements and 35% of daily protein requirements, but that the meal package would have contributed 34% and 44%, respectively, if the soup, main and dessert had been ordered by each consumer, as is recommended.²⁷ Reasons why only one course may be ordered may relate to some of the more mobile MOW consumers choosing to prepare their own desserts.²⁸ Cost constraints or poor appetite may be other important considerations.^{15,29,30} In terms of main meal choices, those that included roast meats were most popular. This probably reflects a more traditional pattern of eating that invokes pleasant memories and provides familiarity, such as the “Sunday roast”.²⁴ MOW clients in other countries similarly demonstrate a preference for a meat-based meal with vegetables.²⁸

New National Meal Guidelines for home-delivered and centre-based meals were released in 2016.³¹ These guidelines define a CHSP meal as any combination of course options that provides up to one-half of the daily requirements for protein, up to one-third of the daily requirements for energy, fibre and most other nutrients, with the exception of calcium. It is recommended that customers have all three courses in a meal. However, if a customer chooses only one course, it should be the main course as this contains the highest amount of nutrients. If they order two courses, it should be a main and dessert, as desserts generally have a higher nutrient value than the entrée. If a customer chooses less than the three courses, they should be advised that other foods need to be added to the home-delivered meal and across the rest of the day to ensure that adequate nutrition is being received. The guidelines clearly state that without ordering three courses, or meeting these needs with other meals and nourishing snacks over the day, then customers will not be meeting the estimated nutrient targets for the meal.

Our finding that a three-course meal is not the preferred option by MOW consumers supports the need for alternative choices to be provided to meet clients' nutritional requirements. Smaller sized meals (mini meals) can be tailored to be more acceptable to those with small appetites but will be even

less likely to meet nutritional guidelines.²⁷ The feasibility of fortifying mini meals has been investigated in a one-month intervention trial in which usual mini meals (~200 g meals) were fortified with energy and protein and provided free of charge, as a main meal and dessert. Of the thirteen clients who completed the study, trends were evident for increased intakes of protein (+12.5 g; $P = 0.056$) and energy (+916 kJ; $P = 0.052$).³² However, further research is required to investigate additional fortified options and uptake over a longer time frame. Provision of an additional daily mid-meal snack may be another useful addition to existing MOW services; however, a pilot study identified that not all MOW consumers at risk of malnutrition perceive that snacks are beneficial for them.³³

Many researchers have highlighted a need for MOW services to be flexible and adaptable enough to keep pace with clients changing needs so as to best support older adults to stay in their homes as long as possible.^{21,22} Qualitative research with MOW clients further supports the requirement for further expansion of offerings, particularly for increased variety of meals for those clients on therapeutic diets, such as texture modified diets.¹⁵ It is important to acknowledge that the role of MOW extends beyond mere provision of a meal, and its value cannot be assessed through its contribution to nutritional status alone. The social contact provided by volunteers and service staff, as well as participation in occasional events offered through the service as outings, is highly valued.^{15,24} Another Australian study that measured loneliness and social isolation in MOW consumers demonstrated that 66% identified social contact as equally important as the meal.³⁴

A limitation of this study is that it provides a snapshot of a sample of consumers receiving MOW from one service in a single geographical area over two time points and may not represent the broader consumer base, in terms of referral patterns and ordering preferences. Another limitation is that the data were collected and analysed for the period 2008 to 2012 and are already dated. Our data are however consistent with surveys of consumers from other MOW services.²² Since individual nutrient intake was not assessed, contribution of the MOW meals to overall nutritional intake could not be assessed, nor could food wastage and under-utilisation of meals in this population be investigated. Meal ordering behaviours in terms of number of meals obtained per week could also not be compared against meal choices, and this is an area for future research. A previous study of clients from another MOW service in NSW found that energy and protein intake was lower on a non-MOW day, compared to days when meals were delivered.²² This was evident only in women, and the reverse was observed for men. It could be hypothesised that men may be more likely than women to receive meals support from family members or be invited out for meals on days on which MOW is not received but this hypothesis remains to be tested.

5 | CONCLUSIONS

Further advocacy and marketing of MOW services to hospital staff, GPs and community-based services is required to ensure timely referral, to better meet the needs of older people living in the community, particularly during convalescence after a hospital discharge. The contribution of other newly added services, such as assistance with meal preparation included in home care packages, to older persons' nutritional needs warrants further investigation. In addition, further research about consumers' social activity, independence, meal utilisation and consumer preferences is required to better understand their reasons regarding meal ordering patterns within the MOW service. This is necessary in order to identify strategies to increase protein and energy content of MOW meal components within the context of challenges such as clients' poor appetites, the necessity to keep meals affordable, a limited variety of meal choices and barriers to meal storage and preparation.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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REFERENCES

1. Department of Health. *Living Longer. Living Better: Aged Care Reform Package*. Canberra: Australian Government Department of Health. 2012. <http://apo.org.au/node/29086>. Accessed November 15, 2018.
2. Department of Health: My aged Care. *Need Aged Care Services? This is the Place to Start*. Canberra: Australian Government My aged Care. 2015. <https://www.myagedcare.gov.au/>. Accessed November 15, 2018.
3. Australian Government Department of Health. *AMR My Aged Care Stage Two Wave 1 Research. Summary of Findings*. 2016. Canberra: Department of Health, 2016. https://agedcare.health.gov.au/sites/g/files/net1426/f/documents/11_2016/amr_my_aged_care_evaluation_summary_of_findings_290916_-_accessible.pdf. Accessed October 28, 2018.
4. Charlton K, Nichols C, Bowden S, et al., Poor nutritional status of older subacute patients predicts clinical outcomes and mortality at 18 months of follow-up. *Eur J Clin Nutr*. 2012;66(11):1224.
5. Charlton KE, Batterham MJ, Bowden S, et al., A high prevalence of malnutrition in acute geriatric patients predicts adverse clinical outcomes and mortality within 12 months. *e-SPEN J*. 2013;8(3):e120-e125.
6. Banks M, Ash S, Bauer J, Gaskill D. Prevalence of malnutrition in adults in Queensland public hospitals and residential aged care facilities. *Nutr Diet*. 2007;64(3):172-178.
7. Capone R, Bilali HE, Debs P, Cardone G, Driouech N. Food system sustainability and food security: connecting the dots. *J Food Sec*. 2014;2(1):13-22.
8. Quine S, Morrell S. Food insecurity in community-dwelling older Australians. *Public Health Nutr*. 2006;9(2):219-224.
9. Ghys E, Blackberry I, Winterton R. A scoping review on food insecurity among older people in rural communities. *J Nut Int Metab*. 2017;8:116.
10. Rosier K. *Food insecurity in Australia*. Who experiences it and how can child and family services support families experiencing it. 2011.
11. Rist G, Miles G, Karimi L. The presence of malnutrition in community-living older adults receiving home nursing services. *Nutr Diet*. 2012;69(1):46-50.
12. Hamirudin AH, Charlton K, Walton K, et al. Implementation of nutrition screening for older adults in general practice: patient perspectives indicate acceptability. *J Aging Res Clin Pract*. 2016;5(1):7-13.
13. Visvanathan R, Macintosh C, Callary M, et al., The nutritional status of 250 older Australian recipients of domiciliary care services and its association with outcomes at 12 months *J Am Geriatr Soc*. 2003;51(7):1007-1011.
14. Lindberg R, Lawrence M, Gold L, Friel S, Pegram O. Food insecurity in Australia: implications for general practitioners. *Aust Fam Physician*. 2015;44(11):859-862.
15. Evans K, Manning F, Walton K, et al., "More than just a meal": a qualitative study of the views and experiences of older people using a Meals on Wheels (MOW) service. *J Aging Res Clin Pract*. 2014; 3(2): 100-106.
16. Wilson A, Dennison K. Meals on wheels service: knowledge and perceptions of health professionals and older adults. *Nutr Diet*. 2011;68(2):155-160.
17. ABS. *Australian Bureau of Statistics: Census Community Profiles – Kiana (A)*. Canberra: ABS; 2016. http://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/LGA14400. Accessed November 15, 2018.
18. Krassie J. *Destinaiton: Good Nutrition*. Strathfield, NSW: Department of Ageing, Disability and Home Care; 2002.
19. Schofield W. Predicting basal metabolic rate, new standards and review of previous work. *Hum Nutr Clin Nutr*. 1985;39:5-41.
20. National Health and Medical Research Council, Australian Government Department of Health and Ageing, New Zealand Ministry of Health. *Nutrient Reference Values for Australia and New Zealand*. Canberra: National Health and Medical Research Council. 2006.
21. O'Dwyer C, Corish C, Timonen V. Nutritional status of Irish older people in receipt of meals-on-wheels and the nutritional content of meals provided. *J Hum Nutr Diet*. 2009;22(6):521-527.
22. Walton K, Charlton KE, Manning F, et al., The nutritional status and energy and protein intakes of MOW clients and the need for further targeted strategies to enhance intakes *Appetite*. 2015;95:528-532.
23. Roy MA, Payette H. Meals-on-wheels improves energy and nutrient intake in a frail free-living elderly population. *J Nut Health Aging*. 2006;10(6):554-560.

24. Timonen V, O'Dwyer C. 'It is nice to see someone coming in': exploring the social objectives of meals-on-wheels. *Can J Aging*. 2010;29(3):399-410.
25. Lee JS, Frongillo EA Jr. Factors associated with food insecurity among US elderly persons: importance of functional impairments. *J Gerontol Series B: Psychol Sci Soc Sci* 2001;56(2):S94-S99.
26. Jack BW, Chetty VK, Anthony D, et al., A reengineered hospital discharge program to decrease rehospitalization: a randomized trial. *Ann Intern Med*. 2009;150(3):178-187.
27. Cheuk WY, Walton K, Charlton K. Evaluating the nutritional content of flagstaff fine foods against the current meals-on-wheels nutrition guidelines and recommended dietary intakes: 194. *Nutr Diet*. 2013;70:23.
28. Lirette T, Podovennikoff J, Wismer W, Tondur L, Klatt L. Food preferences and meal satisfaction of Meals on Wheels recipients. *Canad J Diet Pract Res*. 2007;68(4):214-217.
29. Host A, McMahon A-T, Walton K, Charlton K. Factors influencing food choice for independently living older people—a systematic literature review. *J Nutr Gerontol Geriatr*. 2016;35(2):67-94.
30. Host A, McMahon AT, Walton K, Charlton K. 'While we can, we will': exploring food choice and dietary behaviour amongst independent older Australians. *Nutr Diet*. 2016;73(5):463-473.
31. Australian Meals on Wheels Association. *National Meal Guidelines: A Guide for Service Providers, Caterers and Health Professionals Providing Home Delivered and Centre Based Meal Programs for Older Adults*. Australian Meals on Wheels Association. Australian Meals on Wheels Association, 2016.
32. Walton K, Pham PX, Charlton K, et al. Maximising every mouthful with fortified mini meals. *Nutr Diet*. 2015;72(Suppl. 1):8.
33. Charlton KE, Walton K, Moon L, et al. "It could probably help someone else but not me": a feasibility study of a snack programme offered to meals on wheels clients. *J Nutr Health Aging*. 2013;17(4):364-369.
34. Grant G, Jewell E. *Measuring Loneliness and Isolation Among Meals on Wheels Clients*. Sydney: The Benevolent Society's Northern Beaches Food Services; 2004.

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