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INVESTIGATING KNOWLEDGE ON INDIGENOUS GREEN LEAFY VEGETABLES AMONGST RURAL WOMEN IN ESWATINI

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ABSTRACT

There is emerging concern regarding the decline in knowledge and use of indigenous green leafy vegetables (IGLV) especially in many African countries. Reasons for this are lack of inter-generational knowledge transfer and changes in food values and attitudes. The decline in knowledge influences food choice as consumers tend to favour commercially available foods over traditional diets. In this context, a study was conducted at Eluyengweni in Eswatini to determine, describe and compare IGLV knowledge amongst two generations of rural women. More specifically, the research determined and compared the level of IGLV knowledge (on species identification, accessibility, and preparation) and its mode of transfer between the two groups. The study was exploratory utilising focus group discussions and individual interviews. Results revealed that older women were more knowledgeable than the young group in terms of IGLV identification, accessibility and preparation. The low level of knowledge was partly attributed to stigmatisation and a change of IGLV collection environment from predominantly wild to a more local one (cultivated fields/gardens). Mothers and grandmothers were the most common source of IGLV knowledge for both groups. However, the knowledge was however not systematically transferred. Future research on the underlying reasons for stigmatisation of IGLV is recommended

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INTRODUCTION

Changes in food consumption patterns are prevalent the world over, including in developing countries (Blas et al., 2018). These changes, referred to as nutrition transition, occur as people attempt to adapt to rapid socio-economic and environmental changes. The main causes of this transition in developing economies include globalisation, modernisation and urbanisation (Dandala *et al*., 2018: Fox *et al*., 2019). Cultural globalisation or “westernisation” encourages the

consumption of food that appears “modern”. As such, people tend to abandon local cuisines in preference of “westernised” diets. Modernisation and economic globalisation moreover, increases access to global food networks and consequently, commercially-processed foods. In the same vein however, traditional diets are gradually being replaced (Kasimba *et al*., 2019). The loss or decline in traditional foods creates a cycle of over-reliance on commercially available foods hence, processed and convenience foods have become more available, affordable and more acceptable (World Bank, 2014).

Traditional African food patterns are rich in indigenous foods such as IGLV unlike modern western diets which sometimes incorporate convenience and processed foods (Shegelman *et al*., 2019). An unfortunate consequence of the shift to a convenient and mostly processed diet is an increase in non-communicable diseases, over-nutrition, obesity and under-nutrition in the form of micronutrient deficiencies. According to Kopp (2019), the transition to a western-oriented diet contributes, to a certain extent, to an increase in chronic nutrition-related diseases and micronutrient deficiencies.

Indigenous green leafy vegetables are rich in nutrients that are essential for human health and as such can help address, amongst other things, mineral deficiencies and hunger. These nutrients include calcium, phosphorus, magnesium zinc, vitamin A, vitamin C, and beta-carotene (Dlamini, 2017). For example, amaranth (*Amaranthus spp*.), a popular IGLV, has the highest known beta-carotene content in any African IGLV of up to 7.54 mg per 100g of edible portion (Maunder and Meaker, 2007). Compared to cabbage, Yang and Keding (2009) found *Amaranthus spp*. to contain 57 times more Vitamin A, 13 times more iron and eight times more calcium. According to Kasimba *et al*. (2019), the high nutritive value of most IGLV can eliminate Vitamin A deficiencies among children, pregnant women and the poor, if IGLV were to be consumed regularly. Moreover, indigenous vegetables generally have a shorter growth cycle than most staple crops and also utilise soil nutrients and scarce water supplies better than some conventional crops (Kansiime *et al*., 2018).

Since changes in food consumption patterns are prevalent over the world, Eswatini (formally known as Swaziland) is no exception. In the limited studies available on Eswatini, there is evidence suggesting a gradual shift from a more traditional diet towards a western-oriented form (Dlamini and Lowrey, 2005: World Bank, 2014). The change is widely reported to emanate from socio-structural factors such as migration, modernisation and globalisation (Dandala *et al*., 2018). Since the early 1960s, the reliance on purchased foods at the expense of traditional diet in Eswatini has increased (Kgaphola and Viljoen, 2004: Mamba, 2019). The collateral impact of such a shift however is an erosion of local knowledge regarding the use of IGLV. The decline is partially due to a lack of knowledge transfer between generations, the influence of westernisation and the stigma often associated with IGLV as has been seen in India (Misra *et al.*, 2008). Although abundantly available, IGLV are often poorly used and this is partly attributed to diminishing or lack of knowledge among the younger generation (Maroyi, 2013: Orech *et al*., 2014). Knowledge, especially on nutrition, is critical for food choice as this is strongly correlated to good dietary habits (Asakura *et al*., 2017; Nawaz *et al*., 2016: Noronha *et al*., 2020).

Knowledge is dynamic, continuously adapting to the environment whilst also interwoven with culture (Labadarios *et al*., 2008). According to Galili (2018), knowledge is culturally subjective and emerges from complex cognitive skills. Since culture is learned and food habits are part of culture, knowledge regarding food - such as its nutritional value and what is regarded as edible - is learned from the cultural group to which one belongs. Knowledge therefore, functions as a tool an individual uses to adapt and serves as a predictor of food consumption (Kittler *et al*., 2011). It is through primary socialisation that children learn and become familiar with food readily available in their environments and recognise what is regarded as

edible. Families exert the strongest influence on eating behaviour through socialisation (Larsen *et al*., 2015).

In rural settings, indigenous knowledge promotes sustainable development and carries an environmental protection component that is important for the survival of culture (Magni, 2017). According to Awang (2020), elders are usually the key sources of plant knowledge. A study by Luczaj (2010) in Poland found that people born between 1883-1948 were more familiar with plant species than those born in 1960-2000. Similarly, an anthropological study by Orech *et al*. (2013) in rural Kenya found that knowledge and utilisation of indigenous leafy vegetables was less evident in younger women compared to their older compatriots. Traditionally, Emaswati women obtained indigenous knowledge from their elders and passed this accumulated knowledge on to the next generation (Ogle and Grivetti, 1985a). Mnzava (1997) states lack of knowledge on IGLV includes issues regarding their identification, methods of preparation and preservation. As such the National Food Security Policy of Swaziland prescribes that food security legislation be developed in due course to cater for, amongst other food security aspects, the preservation and promotion of indigenous foods and the relevant indigenous knowledge (Government of Swaziland, 2005). The documentation of knowledge on IGLV is important, especially to promote their use and also to ensure continuous utilisation. However, documentation alone is not sufficient as knowledge evolves over time. It is therefore equally important to determine the whole knowledge transfer process. In this context, the objective of this study was to determine, describe and compare IGLV knowledge among two generations of rural women at Eluyengweni in Eswatini. It is envisaged that findings from this study could inform food-based strategies to alleviate food insecurity and increase dietary diversity within rural households in Eswatini. The account of this research is structured as follows: first, the methodology is described, and followed by results and discussions. Finally conclusions are drawn in relation to the data.

METHODOLOGY

The study was conducted at Eluyengweni, a rural area located in the Middleveld of Eswatini at 26.53^{o} S and 31.23^{o} E. The Middleveld agro-ecological zone of Eswatini is characterised by rolling hills of tall grasses and savannah with scattered trees and shrubs. The average altitude of Eluyengweni is 750m above sea level and the mean annual rainfall is 980mm with most of the rain falling between October and April (Masarirambi *et al*., 2012). The soils in the area are predominantly Oxisol: the most ideal type of soil for crop production in Eswatini. The climate and the soils of the area favour the growth of most IGLV. The main source of water in the area is the Lusutfu River which demarcates the area from the nearby Ntondozi chiefdom. Lusutfu is one of the four major rivers in the country, the others being Komati, Lomati and Mbuluzi. At Eluyengweni the Lusutfu River supplies water for both agricultural and domestic purposes. Also, a huge irrigation canal from the river passes through the area to the nearby agricultural town of Malkerns. The canal benefitted some of the residents of Eluyengweni as various crops and vegetables were cultivated adjacent to it. The crop production activities contributed to the availability of IGLV.

The study was exploratory and descriptive in nature. Exploratory research is conducted to provide patterns and new insights into a phenomenon. An exploratory design is important in defining problems especially in complex contexts where there are multiple, often conflicting worldviews (Shongwe, 2019). This kind of design provides rich, meaningful information or even definitive explanations. Exploratory research is also used to increase researchers' familiarity with the problem context. Descriptive research defines a phenomenon without having to manipulate or control any of the elements involved. Hence, it is used to determine proportions of interest and also to compare relationships between variables (Brown

et al., 2017). Data for the study were collected in two phases. The first phase comprised of focus group discussions (FGD) that were used to explore and get acquainted with the study group and the physical and structural environment. The FGD were also used to formulate questions for the second phase, face-to-face interviews which were conducted using a semi-structured questionnaire. This combination of FGD and interviews was used for the purpose of data completeness and that of confirmation. According to Nyumba *et al*. (2018), FGD are effective than most qualitative approaches when examining group perceptions, attitudes and experiences. Focus group discussions are however subject to conflict, power struggles and other group dynamics (Ravindran, 2019). The use of FGD and interviews in combination further facilitated methodological triangulation and this increased credibility and confirmability of the findings.

A plant identification test kit based on IGLV photographs formed part of both the FGD and interviews. Observation of the natural and physical environment guided the development of the plant identification test kit. Photographs of IGLV were taken with the vegetables in their natural environment. Also, photographs of IGLV available at the local market were used. Other IGLV were identified through extensive literature survey that concentrated on IGLV found in the Middleveld of Eswatini (Dlamini and Mdziniso, 2005; Magagula, 2005; Ogle and Grivetti, 1985a). The test kit was used to ascertain whether the women could correctly identify each of the IGLV on the photographs. The use of identification test kits for data collection is suitable for low-literacy respondents and also saves time (Creswell and Poth, 2017).

The study was conducted on two generations of women. The first group comprised of women aged between 25–45 years $(25 \leq 45)$ and the second, those older than 45 years. (> 45)

Women (especially in Africa) are traditionally considered responsible for the collection and preparation of IGLV (Dlamini, 2017). According to MacClancy and Macbeth (2004), studying two or three generations can uncover various transmission processes regarding food and foodways information. Foodways in this context refers to customs and traditions relating to food and its preparation. The age categories were in line with the United Nations' classification for middle-aged (25-45 years) and old adults (United Nations, 1982). The researchers were of the view that these women might possess some reasonable IGLV knowledge especially when compared to young adults (18-24 years).

Purposive sampling was used to select participants for both the FGD and the interviews. The strength of purposive sampling is that it increases the likelihood of information-rich cases. In total three FGD were held, two with the older women and one with the younger group. Greenwood *et al*. (2014) suggest that FGD groups should be characterised by homogeneity in order to generate useful data. Accordingly, Dilshad and Latif (2013) state that group participants should share similar characteristics such age, gender, ethnicity and social class background. The FGD group size was nine and seven for the older and younger groups, respectively, and was within the acceptable range of 6-10 participants suggested by Krueger and Casey (2015). Sample size in both FGD and interviews was also guided by accessibility and availability of the women. Sample size for the interviews, in addition, was also guided by thematic saturation- the point where few or no new ideas or themes appear. A convenience sample of 102 women was selected for the interviews that were meant to collect detailed accounts of individuals' knowledge pertaining to IGLV. A total of five fieldworkers assisted with the interviews conducted at each participant's home, and each interview lasted for about 30 minutes. Langill (2010) posits that the best way to gather indigenous knowledge about food consumption practices is to conduct interviews at respondents' home settings. According to the Government of Swaziland (2010), there were 626 households in the study area with a population of 2590 of which 1296 were females. Data were collected in the spring of 2016

(August-November) where most of the IGLV were available in the fresh form.

The FGD and interviews were conducted in vernacular (Siswati) to ensure clarity and that all participants were accommodated. Notes were taken in the FGD where an audiotape recorder was used to capture the proceedings of each session. Probing was conducted in cases of ambiguity. Member checks were conducted with the over 45 years focus group two weeks after the first meeting to verify data accuracy, credibility and validity. Member checks with the younger group were however not conducted due to unavailability of members. Member checking is a process of data verification where the participant (s) in a study reviews the accuracy of the previous account to help corroborate findings as well as to provide new evidence that may have been missed during the initial data collection exercise. Member checking as such is widely used to establish of credibility and trustworthiness of research findings. During member checks, data and interpretations are validated as they are derived from members of various audiences and groups (Birt *et al*., 2016). In this study, member checking was only used for the FGD.

The audiotape output from the FGD was transcribed verbatim and edited. Care was taken to translate from Siswati to English without losing the original meaning. The transcripts were coded and key themes were identified, summarised and described. Similarly, responses from the interviews were first grouped according to similar responses and then described. Quantitative data were coded and analysed using Statistical Analysis Software Package (SAS) Version 9.3.

Ethical approval for this research was granted by the Ethics Committee of Faculty of the Natural and Agricultural Sciences at the University of Pretoria. Permission to conduct the research was sought and granted by the chief of the study area. Participation in the research was voluntary and informed consent was obtained from participants after the study was explained to them. Respondents and participants were guaranteed confidentiality and anonymity.

RESULTS AND DISCUSSION

In this research, knowledge of IGLV was captured based on (1) the ability to correctly identify IGLV, (2) the ability to determine seasonal availability, (3) the use and preparation of IGLV, and (4) knowledge transfer. This section provides results and discussions along these four dimensions.

Identification of IGLV

Correct identification of IGLV was based on the plant identification test kit. Indigenous green leafy vegetables were considered as well identified if the informant was able to state its name (in vernacular, Siswati). From observations of the natural and physical environment, it was noted that most the IGLV were collected from cultivated fields and the wild. Indigenous green leafy vegetables that were observed in their natural environment were *Amaranthus spp*., *Bidens pilosa*, *Solanum reroflexum*, and *Sonchus oleraceus* whilst those that were available at the local market were *Amaranthus spp.*, *Bidens pilosa, Corchorus spp.*, *Curcubita spp., Mormodica involucrate, Solanum reroflexum* and *Sonchus oleraceus*. Most of the IGLV at the local market were available in the fresh form. *Mormodica involucrate* however was also available in a dry (powdery) form.

The IGLV that formed part of the plant identification test kit were *Aloe cooperin*, *Amaranthus spp*., *Annesorhiza flagellifolia*, *Bidens pilosa*, *Cochorus spp*., *Curcubita spp*., *Ipomea spp*., *Laportea pedumentaris, Manihot esculenta*, *Momordica involucrate*, *Solanum reroflexum*, and *Tulbaghi lunwigian*. These were considered the most common IGLV that occurred across most of the agro-ecological zones of Eswatini (Dlamini and Mdziniso, 2005). Since some of the women were born and raised in the area whilst others moved to the area as

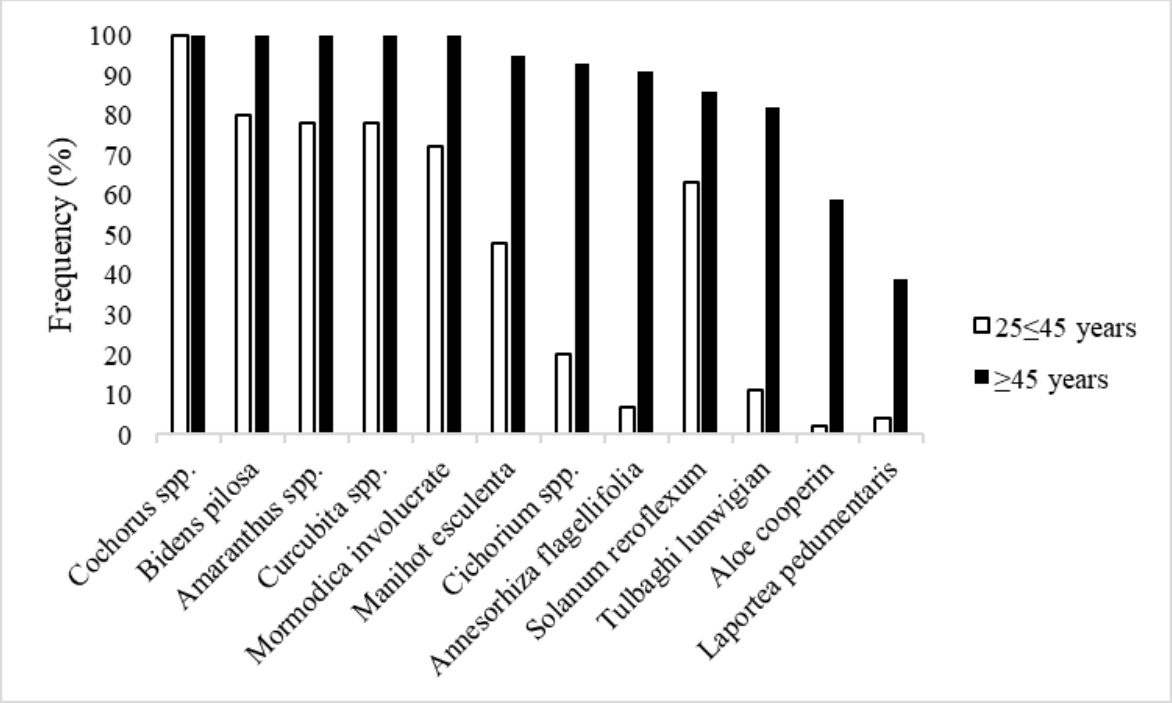

FIGURE 1: PLANT IDENTIFICATION TEST KIT RESULTS

adults, the researchers were of the view that regardless of the previous area of abode, most of these women would have been familiar with the vegetables in the test kit. Results from the FGD revealed that older women were more familiar with most IGLV from the plant identification test kit compared to the younger group. These older women were able to identify all the vegetables whilst the younger group could not identify *Tulbaghi lunwigian, Laportea pedumentaris* and *Aloe cooperin*. A similar trend was evident from the interviews as indicated in Figure 1: younger group members were not familiar with *Cichorium spp*. and *Annesorhiza flagellifolia*.

As shown in Figure 1, all the older women were able to identify *Bidens pilosa*, *Momordica involucrate*, *Amaranthus spp*., *Curcubita spp*., and *Ipomea spp*. *Cochorus spp*. was identified by all women irrespective of age. These results are consistent with other studies: older generations to be more knowledgeable in terms of IGLV identification (Luczaj, 2010: van der Hoeven *et al*., 2013).

Accessibility and seasonal availability

Knowledge of IGLV availability was determined by capturing the season of the year where the vegetables were most available in their freshest form. Accessibility refers to the location where each IGLV was often collected. During the FGD most of the young women suggested that cultivated fields were the main sources of IGLV. Only a few young women mentioned riverbanks and the wild as sources for collection. In contrast, the older women were familiar with most IGLV collection sites including the vegetables that grew on each site. For example, riverbanks served as collection sites for *Aloe cooperin, Tulbaghi lunwigiana, Grewis caffra, and Corchorus spp*. The older women noted that there was an increase in the area's population and as a consequence land that was previously unoccupied (wild) was now used for settlement. This population increase also came with a decrease in the size of crop production land allocated to each homestead.

Most of the women in the FGDs (both old and young) were of the view that the accessibility of IGLV from the wild was not easy mainly due to

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TABLE 1: PLACES WHERE INDIGENOUS GREEN LEAFY VEGETABLES GROW

Indigenous Green Leafy Vegetables	All	Wild						Cultivated fields						Homestead gardens					
		Whole	%	Old	%	Young	%	Whole	%	Old	%	Young	%	Whole	%	Old	%	Young	%
Bidens pilosa	101,0	8,0	7,9	3,0	37,5	5,0	62,5	80,0	79,2	46,0	57,5	34,0	42,5	13,0	12,9	6,0	46,2	7,0	53,8
Mormodica involucrate	101,0	81,0	80,2	49,0	60,5	35,0	43,2	14,0	13,9	6,0	42,9	8,0	57,1	6,0	5,9	3,0	50,0	3,0	50,0
Corchorus spp	100,0	12,0	12,0	7,0	58,3	5,0	41,7	78,0	78,0	42,0	53,8	36,0	46,2	10,0	10,0	6,0	60,0	4,0	40,0
Tulbaghi lunwigiana	50,0	44,0	88,0	35,0	79,5	9,0	20,5	5,0	10,0	2,0	40,0	3,0	60,0	1,0	2,0	-	-	1,0	100,0
Cichorium Spp	65,0	36,0	55,4	29,0	80,6	7,0	19,4	17,0	26,2	11,0	64,7	6,0	35,3	12,0	18,5	7,0	58,3	5,0	41,7
Ipomea spp	94,0	3,0	3,2	3,0	100,0	-	-	66,0	70,2	35,0	53,0	31,0	47,0	25,0	26,6	12,0	48,0	13,0	52,0
Manihot esculenta	92,0	-	-	-	-	-	-	59,0	64,1	30,0	50,8	29,0	49,2	33,0	35,9	22,0	66,7	11,0	33,3
Solanum Areroflexum	96,0	8,0	8,3	6,0	75,0	2,0	25,0	50,0	52,1	26,0	52,0	24,0	48,0	38,0	39,6	21,0	55,3	17,0	44,7
Curcubita spp	101,0	-	-	-	-	-	-	75,0	74,3	43,0	57,3	32,0	42,7	26,0	25,7	12,0	46,2	14,0	53,8
Annesorhiza flagellifolia	56,0	51,0	91,1	39,0	76,5	12,0	23,5	5,0	8,9	2,0	40,0	3,0	60,0	-	-	-	-	-	-
Laportea pedumentaris	22,0	21,0	95,5	14,0	66,7	7,0	33,3	1,0	4,5	1,0	100,0	-	-	-	-	-	-	-	-
Aloe cooperin	40,0	39,0	97,5	31,0	79,5	8,0	20,5	1,0	2,5	-	-	1,0	100,0	-	-	-	-	-	-
Amaranthus spp.	102,0	4,0	3,9	2,0	50,0	2,0	50,0	73,0	71,6	42,0	57,5	31,0	42,5	25,0	24,5	11,0	44,0	14,0	56,0

TABLE 2: SEASONAL AVAILABILITY OF INDIGENOUS GREEN LEAFY VEGETABLES

Indigenous Green Leafy Vegetables	Spring						Autumn						Summer						Winter						All Year					
	N=102	%	Older Group	%	Younger Group	%	N=Whole Group	%	Older Group	%	Younger Group	%	N=Whole Group	%	Older Group	%	Younger Group	%	N=Whole Group	%	Older Group	%	Younger Group	%	N=Whole Group	%	Older Group	%	Younger Group	%
Bidens pilosa	-	-	-	-	-	-	3	2.9	2	3.6	1	2.2	75	74.3	43	78.2	32	69.6	-	-	-	-	-	-	23	22.8	10	18.2	13	28.3
Mormodica involucrate	-	-	-	-	-	-	7	6.9	6	10.9	1	2.2	66	65.3	38	69.1	28	60.9	1	1	-	-	1	2.2	27	26.7	11	20	16	34.8
Corchorus spp	-	-	-	-	-	-	1	1	1	1.8	-	-	89	89	49	89.1	40	88.9	2	2	1	1.8	-	-	8	8	4	7.3	4	8.8
Tulbaghi lunwigiana	1	1.7	1	2.2	-	-	6	10.2	4	8.9	2	14.5	31	52.5	23	51.1	8	57.1	5	8.5	4	8.9	1	7.1	16	27.1	13	28.9	3	21.4
Cichorium Spp	-	-	-	-	-	-	3	4.6	2	4.3	1	5.3	30	46.2	21	45.7	9	47.4	10	15.4	7	15.2	3	15.8	22	33.8	16	34.8	6	31.6
Ipomea Spp	5	5.3	3	6	2	4.5	2	2.1	1	2	1	2.3	52	55.3	26	52	26	59.1	3	3.2	1	2	1	4.5	32	34.0	19	38	13	29.5
Manihot esculenta	1	1.1	-	1	1	2.5	2	2.2	1	2	1	2.5	38	42.2	18	36	20	50	7	7.7	6	12	1	2.5	42	46.7	25	50	25	42.5
Solanum reroflexumm	-	-	-	-	-	-	3	3.2	2	3.8	2	2.3	70	72.9	37	69.8	33	76.7	4	4.2	3	5.7	3	2.3	19	19.8	11	20.8	8	8.6
Curcubita spp	-	-	-	-	-	-	1	1	-	-	1	2.2	96	96	53	96.4	43	95.5	-	-	-	-	-	-	3	3	2	3.6	1	2.2
Annesorhiza flagellifolia	1	1.8	1	2.4	-	-	6	10.7	5	12.2	1	6.7	6	10.7	5	12.2	1	6.7	20	35.7	15	36.6	5	33.3	3	5.4	3	7.3	-	-
Laportea pedumentaris	-	-	-	-	-	-	2	2.5	2	12.5	-	-	5	6.3	4	25	1	14.3	3	3.8	2	12.5	1	14.3	13	16.5	8	50	5	71.4
Aloe cooperin	1	2.5	1	3.2	-	-	5	12.5	5	16.1	-	-	14	35	11	35.5	3	33.3	2	5	1	3.2	1	11.1	18	45	13	41.9	5	5
Amaranthus	-	-	-	-	-	-	5	5	2	3.6	3	6.5	86	85.1	47	85.5	39	84.8	2	2	2	3.6	-	-	8	7.9	4	7.3	4	8.7

the distance they have to cover to the nearest mountains and private tree plantations. An older woman in one of the FGDs said that "*Kumele ngihambe libanga lelidze nangiyowukha tibhidvo tasendle nangitikhanuka, Bekungasiyo inkinga kadzeni ngoba bengisemncane ngisenemandla,kulamalanga angisakhoni kuhamba libanga lelidze nekugobana sekulukhuni ngoba sengikhulile.*" This translated verbatim is: "I have to walk a long distance if I feel like eating IGLV from the wild and this was not a problem in the olden days because I was young and fit. Nowadays however I can hardly walk that distance, let alone bend".

Based on the interview data, Table 1 shows the places where IGLV were collected. As indicated, IGLV were collected from the wild, cultivated fields and homestead gardens. The findings in Table 1 concurred with those from the FGD. As can be seen in Table 1, *Aloe cooperin* (97.5%, n=40), *Laportea pedumentaris* (95.5%, n=22), *Annesorhiza flagellifolia* (91.1%, n=56), *Tulbaghi lunwigiana* (88%, n=50) and *Mormodica involucrate* (80.2%, n=101) were mostly collected from the wild. Most of *Bidens pilosa* (79.2%, n=101), *Corchorus spp*. (78%, n=100) and *Amaranthus spp*. (71.6%, n=102) were gathered from cultivated fields. In the field most of these IGLV however, occurred as weeds. *Curcubita spp*. (74.3%, n=101), *Ipomea spp*. (70.2%, n=94) and *Manihot esculenta* (64.1%, n=92) were also collected from cultivated fields but unlike the other IGLV in Table 1, these were planted on purpose.

It can be seen from Table 1 that compared to their younger counterparts, older women were more familiar with the collection of all IGLV from the wild (with the exception of *Bidens pilosa*). Younger women on the other hand were much familiar with all IGLV collected on cultivated fields except for *Curcubita spp*., *Amaranthus spp*. and *Laportea pudumentaris*. This partly explains the poor identification of species that mostly appear in the wild by the younger group in Figure 1 (*Aloe cooperin, Annesorhiza flagellifolia, Cichorium spp*., *Laportea pedumentaris*, and *Tulbaghi lunwigian*).

Most of the IGLV were available in the summer season. This is consistent with the findings of Dlamini and Mdziniso (2005) on the seasonality of IGLV in Eswatini. Similar findings are reported in other African countries (Mabala, 2018: Ndhlovu, 2019). Table 2 shows the seasonal availability results from the interviews.

It is evident from Table 2 that *Curcubita spp.* (53%, n=100), *Cochorus spp.*, (49%, n=100), *Amaranthus spp.* (47%, n=105), *Bidens pilosa* (43%, n=101), *Tulbaghi lunwigiana* (40%, n=59), *Solanum reroflex* (38.5%, n=96), *Momordica involucrata* (37.5%, n=101), and *Ipomea spp*., (27.7 %, n=94) were available during summer. *Laportea pedumentaris*, *Manihot esculenta* and *Aloe cooperin* were perennial, available throughout the year (frequency of seasonal availability was highest for both the young and older group under this category compared to other seasons, individually).

Knowledge of the use and preparation of IGLV

Knowledge of the use of IGLV is important so that they are more likely to be incorporated into daily diets. Knowledge as used in this research refers to an understanding of information, or skill acquired through experience. It is what the women knew, the facts, information, skills and understanding gained through learning or experience. The inclusion of IGLV in the diet of the women of Eluyengweni shows that they possessed knowledge of their use. From the FGD it was stated IGLV were used as a relish together with the staple maize meal porridge. The women argued that IGLV were affordable, if not a free, form of relish. However, a few stated that they consumed IGLV as a last resort in cases where there was no alternative relish. Most of those that consumed IGLV were nonetheless, from the young FGD. Some participants in the FGD explained that they ate IGLV for health benefits believing that some have medicinal properties such as the regulation of Diabetes Mellitus and blood pressure. Other participants mentioned that IGLV were part of the Emaswati culture hence their continued use.

TABLE 3: REASONS FOR USING INDIGENOUS GREEN LEAFY VEGETABLES

Reason	All		Older women (n=56)		Younger women (n=46)	
	n	%	n	%	n	%
Health and nutrition related	87	85.3	47	84.0	40	87.0
Affordable relish	40	39.2	19	33.9	23	50.0
Sensory attributes	9	8.8	5	8.9	4	8.7
Swazi culture	4	3.9	4	7.1	0	0.0

The reasons for consumption were also captured in the individual interviews (Table 3). As shown, most of the women used IGLV because of health and nutrition-related benefits (62.1%, n= 140). Heath-related benefits had also been identified to be the main reason for the consumption of IGLV by older women in a study by Chambers et al. (2008). Indigenous green leafy vegetables contain significant amounts of nutrients that are essential for human health such as essential fatty acids, minerals, amino acids and dietary fibre. Green leafy vegetables are abundant sources of calcium, phosphorus, magnesium, zinc, and vitamin A and C. According to Faber *et al*. (2010), most IGLV are high in vitamin A than most cultivated vegetables. Most IGLV are low in kilojoules, contain low carbohydrates and have a low glycaemic index. The low kilojoule value, carbohydrates content and glycaemic index coupled with the higher fibre content have been found to reduce the risk of cardiovascular diseases and type II diabetes (Darkwa and Darkwa, 2013; Natesh *et al*., 2017).

Affordability of IGLV was more important for the younger women (34.3%, n= 67) compared to the older group (25.3%, n= 75). This could mean that most of the younger women were buying IGLV from vendors rather than collecting from the original environment. Access to markets could have had a negative impact especially because the local market sold IGLV that were mostly collected from cultivated fields and backyard gardens. As few varieties were on offer there, consumers using the market as the only source have a restricted choice. This as such, may also limit their knowledge of other varieties. Only a small number of women consumed IGLV for cultural reasons (2.9%, n= 4). These women belonged to the older group. These women argued that even their grandmothers consumed IGLV. Similarly, Cloete and Idsardi (2013) found that culture and tradition were important motivators for the consumption of indigenous crops.

Indigenous green leafy vegetables were prepared either on their own or in combination with other species. This was consistent with other studies by Dlamini and Mdziniso (2005) and also Mavengahama *et al*. (2013). The reasons given for mixing different types of IGLV were to counteract bitterness, sliminess and to improve flavour. *Amaranthus spp.*, for example, was often cooked in combination with *Bidens pilosa* to improve flavour. Indigenous green leafy vegetables were also mixed to increase quantity especially when individual species become scarce.

The main preparation method for IGLV as mentioned in the FGD was boiling and this included three main recipes. The first recipe was to boil the leaves until soft and then add crushed peanuts or sesame seeds. Salt (sodium chloride) would thereafter be added and stirred into the vegetables. The second recipe was to first boil a baby pumpkin. Chopped IGLV would then be added to the pumpkin and boiled to soft. Crushed peanuts or sesame seeds and salt would thereafter be added as the mixture simmer for few minutes. The third recipe was to first prepare a sauce (*Indakala*). Chopped IGLV would then be stirred into the sauce and simmered for a few minutes. *Indakala* is prepared by boiling chopped onions, tomato and crushed peanuts until they form a smooth paste. It was also mentioned that other women add vegetable oil to their cooking. This addition of cooking oil however, is relatively new as previous Swazi literature only reports on salt, groundnuts, sesame seeds, and pumpkin seed (Ogle and Grivetti, 1985b). The addition of

onions, peanuts, sesame seeds, and tomato in the recipes provides a substantial increase in protein, healthy fat, energy, vitamin C and calcium. Consumption of higher levels of salt however increases calcium loss through urine (Ejoh *et al*., 2017) and is also associated with the prevalence of hypertension (Feng *et al*., 2017).

Corchorus spp (*ligusha*) was prepared differently from most IGLV. Firstly, an ash solution was prepared separately by mixing aloe ash in water. The solution's solids were then allowed to sink to the bottom of the container and the liquid added to boiling water. The *ligusha* was thereafter added to the boiling solution and cooked further. According to some of the women the ash solution was an old practice hence few women practiced it. A common alternative to the ash solution was the use sodium bicarbonate. The participants stated that the use of bicarbonate of soda however destroyed some of the nutrients in the *ligusha*. These nutrients however, were not specified although it has been reported that the addition of sodium bicarbonate to IGLV has adverse effects on vitamin C (Nesamvuni *et al.*, 2001).

Knowledge transfer

Family exerts the strongest influence on eating behaviour through socialisation. It is through socialisation that children become familiar with food within their environment. According to Turreira-García *et al*. (2015), transfer of knowledge on wild fruits is promoted by amongst others, familiarisation with the resource, observation and/or helping adults. Loss of knowledge therefore can be attributed to changes in social relationships, exhaustion of resource and/or access to an alternative. One of the common explanations given for the decline in the use of IGLV is that the younger generation is no longer able to correctly identify IGLV (Quaye *et al*., 2009). Most of the older women in the FGD mentioned that they gained knowledge on IGLV from their mothers and grandmothers. These women (older) stated that IGLV identification occurred while accompanying their elders to collect firewood. The transfer process (mothers and grandmothers) was the same with the younger group except that IGLV identification with this group mostly occurred during crop weeding. The change of the familiarisation environment from the wild to local (crop weeding) however, narrows the scope for the younger generation. All of the IGLV in the study occurred naturally in the wild (except for *Curcubita spp*., and *Ipomea spp*.) whilst the same is not true for the local environment (cultivated fields and gardens).

Table 4 shows knowledge transfer results from the interviews. This has three dimensions *viz*. collection, preparation and the use IGLV as a source of food. Most of the knowledge on all these three dimensions was mostly acquired from mothers and grandmothers, respectively. In their study, Awang *et al*. (2020) found that the elderly were the custodians of most IGLV knowledge and as such, these were responsible for transferring IGLV knowledge to the younger generation. The transfer of knowledge from mothers and grandmothers was predominantly high for the older group (Table 4) compared to the younger generation in all three dimensions of knowledge (except for mothers in IGLV as a Food Source). This might mean that the younger generation had spent less time with their mothers and/or grandmothers as compared to the older generation, or there was a shift in what was being transferred (e.g. from IGLV to western food). It was also noticed in one of the focus group discussions that most of the younger women had a negative attitude towards IGLV. One of the participants was overheard saying: "*Uyatiphekela make umbhidvo wakhe tsine asinandzaba nawo"*- meaning that her mother prepared the IGLV relish on her own and that she was not interested in the process because she did not like IGLV relish. The negative attitude towards IGLV is not unique to Eluyengweni as similar findings were reported in Kenya (Orech *et al*., 2013). Also, research by Chacha (2017) found that most middle-aged people in Tanzania considered IGLV as primitive, old-fashioned and indicative of lower socio-economic status. The stigma associated

TABLE 4: SOURCES OF KNOWLEDGE FOR INDIGENOUS GREEN LEAFY VEGETABLES COLLECTION, PREPARATION AND CONSUMPTION

	All		Older group		Younger group	
	n	%	n	%	n	%
IGLV Collection						
Mother	76	53.9	44	57.9	32	42.1
Father	15	10.6	9	60.0	6	40.0
Grandmother	36	25.5	21	58.3	15	41.7
Others	14	10.0	6	42.9	8	57.1
IGLV Preparation						
Mother	76	57.1	44	57.9	32	42.1
Father	8	6.0	3	37.5	5	62.5
Grandmother	36	27.1	19	52.8	17	47.2
Others	13	9.8	4	30.8	9	69.2
IGLV as a Food source						
Mother	75	53.6	40	53.3	35	46.7
Father	13	9.3	9	69.2	4	30.8
Grandmother	29	20.7	16	55.2	13	44.8
Others	23	16.4	12	52.2	11	47.8

with the use of IGLV complicates the knowledge transfer process as the younger generation (intended recipients) lack intrinsic motivation. Changing intrinsic motivation is however difficult and the outcome more uncertain (Locke and Schattke, 2018).

Compared to knowledge on IGLV as a food source (53.6%, n=140) and collection (53.9%, n=141), the most shared form of knowledge from mothers was IGLV preparation (57.1%, n=133). Grandmothers followed the same pattern with 27.5% (n=133), 25.5% (n=141) and 20.7% (n=140) for IGLV preparation, collection and IGLV as a food source, respectively. This shows that culturally in most of the families' food preparation was reserved for women. One of the older participants in one of the FGD stated that "*Besibuka gogo uma asiphekela umbhidvo*"- meaning that they used to watch their grandmother whilst she prepared an IGLV relish. Supporting the notion that women were responsible for food preparation is the fact that fathers as a source of preparation knowledge (Table 4) was quite low (6%, n=133) even when compared to collection (10.6%, n=141) and food source (9.3%, n=140). This may be due to the fact that historically Emaswati men do not assume food preparation roles. The number of fathers that were sources for food preparation knowledge was however higher for the younger group (7.9%, n=63) compared to the older women (4.3%, n=70). This shows a shift in food preparation, with men taking an increasing role.

The transfer of knowledge from "other" sources was highest (16.4%, n=140) for the IGLV as a food source dimension compared to the collection (10%, n=140) and preparation (9.8%, n=133). More specifically, the transfer of knowledge from "others" was higher than from fathers (9.3%, n=140) in this dimension. This was because of mass media, the national radio (Eswatini Broadcasting and Information Services) in particular, which played a huge role in the promotion of IGLV utilisation (through programmes sponsored by the Ministry of Agriculture). Mass media was mostly used a knowledge source by the younger group (17.5%, n=140). Some of the younger women indicated that they obtained knowledge on the use of IGLV from school. The use of mass media, community-based outreach and educational programmes in schools to promote the use of indigenous vegetables is widespread in Africa. Research conducted in Tanzania found that community outreach programmes positively influence participants' perceptions of indigenous vegetables usage (Kansiime *et al*., 2018). A study by van Rensburg *et al*. (2007) conducted in South Africa had found that awareness campaigns contributed to a positive change in

IGLV perceptions amongst both youth and adults.

CONCLUSION

Knowledge of IGLV is important in order to ensure their continuous utilisation. Equally important is the IGLV knowledge transfer process. In this context, a study was conducted in at Eluyengweni Eswatini to determine, describe and compare IGLV knowledge among two generations of rural women *viz.* young and older. More specifically, the research determined IGLV knowledge on species identification, accessibility, and preparation. The mode of knowledge transfer was also determined. The study found that most of the IGLV in the area were collected in cultivated field/gardens and the wild. In general, older women were found to possess more IGLV knowledge than their younger compatriots. More specifically, older women possessed more knowledge on IGLV species identification, accessibility and preparation. The older generation was able to identify most species across all collection locations whilst the younger group was more comfortable with species collected on cultivated fields/gardens. As such, only a few members of the younger women were familiar with *Aloe cooperin, Annesorhiz*a *flagellifolia, Cichorium spp*., *Laportea pedumentaris*, and *Tulbaghi lunwigian* (these were predominantly collected in the wild). The most common reasons for the consumption of IGLV in the area were health and nutrition-related (62.1%, n=140) and also affordability (28.6%, n=140). The women believed that most of the IGLV have medicinal properties and such as are used to regulate blood sugar and pressure. Affordability was however, mostly important for the younger women (34.3%, n= 67) compared to the older group (25.3%, n= 75) and this indicated that most of the younger women were buying IGLV from the local vendors rather than sourcing it themselves from fields or the wild. It was found that most of the IGLV knowledge possessed by the women in the area was transferred from their mothers and grandmothers. Compared to knowledge on IGLV as a food source and IGLV collection, the most shared form of knowledge from mothers and grandmothers was on IGLV preparation. It can be concluded that the younger women at Eluyengweni possessed low levels of IGLV knowledge and this could be attributed to a change of the IGLV collection environment from the wild to more local (cultivated fields/gardens) which narrowed the scope. Low levels of knowledge could also be attributed to negative attitudes harboured by the younger women towards IGLV. A limitation to the study was the lack of member checking on the younger group and this could have affected the FGD results. The use of FGD and interviews in combination however, facilitated methodological triangulation and this increased credibility and confirmability of the findings. Interventions to improve IGLV perceptions especially among young people in the area are also recommended. Future research on the underlying causes of IGLV stigmatisation is also recommended.

REFERENCES

Asakura, K., Todoriki, H. & Sasaki, S., 2017, 'Relationship between nutrition knowledge and dietary intake among primary school children in Japan: Combined effect of children's and their guardians' knowledge', *Journal of Epidemiology* 27(10), 483-491.

Awang, N. A., Mat, N. & Mahmud, K., 2020, 'Traditional knowledge and botanical description of edible plants from Besut, Terengganu, Malaysia', *Journal of Agrobiotechnology* 11(1), 32-47.

Birt, L., Scott, S., Cavers, D., Campbell, C. & Walter, F., 2016, 'Member checking: A tool to enhance trustworthiness or merely a nod to validation?', *Qualitative Health Research* 26(13), 1802-1811.

Blas, A., Garrido, A., Unver, O. & Willaarts, B., 2019, 'A comparison of the Mediterranean diet and current food consumption patterns in Spain from nutritional and water perspective', *Science of the Total Environment* 664, 1020-1029.

Brown, T. J., Suter, T. A. & Churchill, G. A.,

2017, *Basic marketing research: Consumer insights and managerial action*, Cengage Learning, Stamford, CT.

Chacha, J., 2017, 'The potential role of underutilizes vegetables in improving food and nutrition security in Tanzania', PhD thesis, Sokoine University of Agriculture.

Chambers, S., Lobb, A., Butler, L. T. & Traill, W. B., 2008, 'The influence of age and gender on food choice: A focus group exploration', *International Journal of Consumer Studies* 32, 356–365.

Cloete, P. C. & Idsardi, E. F., 2013, 'Consumption of indigenous and traditional food crops: Perceptions and realities from South Africa', *Agroecology and Sustainable Food Systems* 37(8), 902–914.

Creswell, J. W. & Poth, C. N., 2017, *Qualitative inquiry and research design: Choosing among five approaches*, Sage, Thousand Oaks.

Darkwa, S. & Darkwa, A. A., 2013, 'The use of indigenous green leafy vegetables in the preparation of Ghanaian dishes', *Journal of Food Processing and Technology* 4(12), 1-7.

Dandala, P., Kolanisi, U., van Onselen, A. & Green, J. M., 2018, 'Black South African women's perceptions of obesity in the Msunduzi district of Pietermaritzburg', *Journal of Consumer Sciences* 3, 22-29.

Dilshad, R. M. & Latif, M. I., 2013, 'Focus group interview as a tool for qualitative research: An analysis', *Pakistan Journal of Social Sciences* 33 (1), 191–198.

Dlamini, V. V., 2017, 'Adult women in Eluyengweni, Swaziland: Their food practices and knowledge of indigenous green leafy vegetables', Masters Consumer Science dissertation, Dept. of Consumer Science, University of Pretoria.

Dlamini, N. & Lowrey, P., 2005, 'New ways of saving the old ways of helping countries to rescue traditional foods and crops', Ministry of Agriculture and Cooperatives, Mbabane.

Dlamini, N. & Mdziniso, P., 2005, 'An inventory of indigenous crops and wild edible species and their preparation methods: A case study of Manzini region', Ministry of Agriculture and Cooperatives, Mbabane.

Ejoh, A. R., Djuikwo, N. R. V. & Mbofung, C. M., 2017, 'Mineral profile and the effect of processing of some leafy vegetables indigenous to Cameroon', *African Journal of Food, Agriculture, Nutrition, and Development* 17(3), 12362-12376.

Faber, M., Oelofse, A., van Jaarsveld, P. J., Wenhold, F. E. M. & Jansen van Rensburg, W. S., 2010, 'African leafy vegetables consumed by households in the Limpopo and KwaZulu-Natal provinces in South Africa', *South African Journal of Clinical Nutrition* 23(1), 30–38.

Feng, W., Dell'Italia, L. J. & Sanders, P. W., 2017, 'Novel paradigms of salt and hypertension', *Journal of American Society of Nephrology* 28(5), 1362-1369.

Fox, A., Feng, W. & Asal, V., 2019, 'What is driving global obesity trends? Globalisation or "modernization"?', *Globalization and Health* 15 (1), 32.

Galili, I., 2018, 'Scientific knowledge as culture: A paradigm for meaningful teaching and learning of science', in M. R. Matthews (ed.), *History, Philosophy and Science Teaching: New Perspectives*, pp. 203-233, Springer, Sydney.

Government of Swaziland, 2010, '2007 Population and housing census volume 1-6', Mbabane.

Government of Swaziland, 2005, 'National food security policy for Swaziland', Mbabane, Swaziland.

Greenwood, N., Ellmers, T. & Holley, J., 2014, 'The influence of ethnic group composition on focus group discussions', *BMC Medical Research Methodology* 14(1), 107.

Kansiime, M. K., Ochieng, J., Kessy, R., Karanja, D., Romney, D. & Afari-Sefa, V., 2018. 'Changing knowledge and perceptions of African indigenous vegetables: The role of community-based nutritional outreach', *Development in Practice* 28(4), 480-493.

Kasimba, S., Covic, N., Motswagole, B., Laubscher, R. & Claasen, N., 2019, 'Consumption of traditional and indigenous foods and their contribution to nutrient intake among children and women in Botswana', *Ecology of Food and Nutrition* 58(3), 281-298.

Kgaphola, M. S. & Viljoen, A. T., 2004, 'Food habits of rural Swazi household: 1939-1999. Part 2: Social structural and ideological

influences on Swazi food habits', *Journal of family Ecology and Consumer Science* 32, 16 – 25.

Kittler, P.G., Sucher, K. & Nelms, M., 2011, *Food and culture*, Cengage Learning, Belmont.

Kopp, W., 2019, 'How western diet and lifestyle drive the pandemic of obesity and civilization diseases', *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy* 12, 2221-2236.

Krueger, R. A. & Casey, M. A., 2015, *Focus groups: A practical guide for applied research*, Sage, Thousand Oaks.

Labadarios, D., Dhansay, A. & Hendricks, M., 2008, 'The nutrition transition in South Africa: Demographic, socio-economic and health indicators', in N. P. Steyn & N. Temple (eds.), *Community nutrition textbook for South Africa: A rights based approach*, pp. 101-160, Medical Research Council, Tygerberg.

Langill, S., 2010, *Indigenous knowledge: A resource kit for sustainable development researchers in dryland Africa*, International Development Research Centre, Ottawa.

Larsen, J. K., Hermans, R. C. Sleddens, E. F., Engels, R. C., Fisher, J. O. & Kremers, S. P., 2015, 'How parental dietary behaviour and food parenting practices affect children's dietary behaviour. Interacting sources of influence?', *Appetite* 89, 246-256.

Locke, E. A. & Schattke, K., 2018, 'Intrinsic and extrinsic motivation: Time for expansion and clarification', *Motivation Science* 5(4), 277-290.

Luczaj, L., 2010, 'Changes in the utilization of wild green vegetables in Poland since the 19th century: A comparison of four ethnobotanical surveys', *Journal of Ethnopharmacology* 128(2), 395–404.

Mabala, M. H. R., 2018, 'Availability and utilization of indigenous leafy vegetables (ILVs) found in Limpopo Province and the response of selected ILV to planting density and nitrogen fertilizer rate', MSc dissertation, University of Limpopo.

MacClancy, J. V. & Macbeth, H. M., 2004, 'Introduction: How to do anthropologies of food', in H. H. Macbeth & J. V. McClancy (eds.), *Researching food habits: Methods and problems,* pp. 1–14, Berghahn Books, New York.

Magagula, S. N., 2005, 'The role of indigenous knowledge in sustainable crop production in Luyengo', BSc dissertation, University of Swaziland.

Magni, G., 2017, 'Indigenous knowledge and implications for the sustainable development agenda', *European Journal of Education* 52(4), 437-447.

Mamba, S. F., 2019, 'Drought, urban resilience and urban food security in kaKhoza, Manzini, Swaziland', PhD thesis, Dept. of Geography, Environmental Studies and Tourism, University of Western Cape.

Maroyi, A., 2013, 'Use of weeds as traditional vegetables in Shurugwi District, Zimbabwe', *Journal of Ethnobiology and Ethnomedicine* 9 (1), 60.

Masarirambi, M. T., Sibandze, N., Wahome, P. K. & Oseni, T. O., 2012, 'Effects of kraal manure application rates on growth and yield of wild okra (Corchorus olitorius L.) in a subtropical environment', *Asia Journal of Agricultural Science* 4(1), 89-95.

Maunder, E. M. W. & Meaker, J. L., 2007, 'The current and potential contribution of home-grown vegetables to diets in South Africa', *Water SA* 33 (3), 401-406.

Mavengahama, S., McLachlan, M. & de Clercq, W., 2013, 'The role of wild vegetable species in household food security in maize based subsistence cropping systems', *Food Security* 5 (2), 227–233.

Misra, S., Maikhuri, R. K., Kala, C. P., Rao, K. S. & Saxena, K. G., 2008, Wild leafy vegetables: A study of their subsistence dietetic support to the inhabitants of Nanda Devi biosphere reserve, India', *Journal of Ethnobiology and Ethnomedicine* 4(1), 15.

Mnzava, N. A., 1997, 'Vegetable crop diversification and the place of traditional species in the tropics', in L. Guarino (ed.), *Traditional African vegetables*, pp. 1–15, International Plant Genetic Resources Institute, Rome.

Natesh, H. N., Abbey, L. & Asiedu, S. K., 2017, 'An overview of nutritional and anti-nutritional factors in green leafy vegetables', *Horticulture International Journal* 1(2), 58-65.

Nawaz, M., Khalid, S. & Ahmed, S., 2016, 'A

study to assess relationship between nutrition knowledge and food choices among young females', *EC Nutrition* 6, 13-23.

Ndhlovu, B., 2019, 'An exploration of the access and consumption of indigenous vegetables by household in rural and informal settlements in West Coast District Municipality, Western Cape Province, South Africa', MSc Dissertation, University of South Africa.

Nesamvuni, C., Steyn, N. P. & Potgieter, M. J., 2001, 'Nutritional value of wild, leafy plants consumed by the Vhavenda', *South African Journal of Science* 97(1–2), 51–54.

Noronha, D.C., Santos, M.I., Santos, A.A., Corrente, L.G., Fernandes, R.K., Barreto, A.C., Santos, R.G., Santos, R.S., Gomes, L.P. & Nascimento, M.V., 2020, 'Nutrition knowledge is correlated with a better dietary intake in adolescent soccer players: A cross-sectional study', *Journal of Nutrition and Metabolism* 2020, 7.

Nyumba, O. T., Wilson, K., Derrick, C. J. & Mukherjee, N., 2018, 'The use of focus group discussion methodology: Insights from two decades of application in conservation', *Methods in Ecology and Evolution* 9(1), 20–32.

Ogle, B. M. & Grivetti, L. E., 1985a, 'Legacy of the chameleon: Edible wild plants in the kingdom of Swaziland, Southern Africa. A cultural, ecological, nutritional study. Part III Cultural and ecological analysis', *Ecology of Food and Nutrition* 17(1), 31–40.

Ogle, B. M. & Grivetti, L. E., 1985b, 'Legacy of the chameleon: Edible wild plants in the Kindom of Swaziland, Southern Africa. A cultural, ecological, nutritional study. Part II demographics, species availability and dietary use, analysis by ecological zone', *Ecology of Food and Nutrition* 17(1), 1–30.

Orech, F.O., Friis, H., Estambale, B.A., Ogoye-Ndegwa, C. & Aagaard-Hansen, J., 2013, 'Food safety and food security in relation to consumption of indigenous leafy vegetables among the Luo in western Kenya', *Journal of Nutritional Ecology and Food Research* 1(3), 240–245.

Quaye, W., Gyasi, O., Larweh, P., Johnson, P. N. T. & Obeng-Aseidu, P., 2009, 'The extent of marketability and consumer preferences for traditional leafy vegetables - A case study at selected markets in Ghana', *International Journal of Consumer Studies* 33(3), 244–249.

Ravindran, T., 2019, 'Geographies of indigenous identity: Spatial imaginaries and racialised power struggles in Bolivia', *Antipode* 51(3), 949-967.

Shegelman, I. R., Shchukin, P. O. & Vasilev, A. S., 2019, 'Analysis of the current situation related to the food security of indigenous population of the Northern Russia', *EurAsian Journal of BioSciences* 13(2), 663-672.

Shongwe, M. I., 2019, 'Developing a diagnostic heuristic for integrated sugarcane supply and processing systems', PhD thesis, Dept. of Bioresources Engineering, University of KwaZulu-Natal.

Turreira-García, N., Theilade, I., Meilby, H. & Sorensen, M., 2015, 'Wild edible plant knowledge, distribution and transmission: A case study of the Achí Mayans of Guatemala', *Journal of Ethnobiology & Ethnomedicine* 11(1), 52.

United Nations, 1982, 'Provisional guidelines on standard international age classification', viewed 21 June 2013, from https://unstats.un.org/unsd/publication/SeriesM/SeriesM_74e.pdf.

van der Hoeven, M., Osei, J., Greeff, M., Kruger, A., Faber, M. & Smuts, C. M., 2013, 'Indigenous and traditional plants: South African parents' knowledge, perceptions and uses and their children's sensory acceptance', *Journal of Ethnobiology & Ethnomedicine* 9(1), 78.

van Rensburg, W. J., van Zijl, J. J. B. & Sonja, L. V., 2007, 'The importance of traditional leafy vegetables in South Africa', *African Journal of Food, Agriculture, Nutrition and Development* 7 (4), 1-13.

World Bank, 2014, 'Nutrition at a glance: Swaziland', viewed 13 May 2016, from http://siteresources.worldbank.org/NUTRITION/Resources/281846-1271963823772/Swaziland4811screen.pdf.

Yang, R. Y. & Keding, G. B., 2009, 'Nutritional contributions of important African indigenous vegetables', in C. M Shacketon, M. W. Pasquini, & A. W. Drescher (eds.), *African vegetables in urban agriculture*, pp. 105-143, Earthscan, London