

# Development, Translation and Validation of the Circle of Life (CoL) Satisfaction Scale Assessment Tool: An Integrative Nutrition Approach

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## Abstract

**Objectives:** This study was designed to validate, test and translate a newly developed assessment tool for health coaches to assess client's satisfaction rates of the Circle of Life (CoL), as a guide for weight management and also to monitor clients' health and wellbeing improvements. This includes development of the assessment content, content validity, translating and pretesting the tool among potential clients. **Method:** 18 participants enrolled in a telenutrition weight loss program was and received a hypocaloric diet that was supported with monthly telemonitoring and health coaching sessions remotely for 6 months. Thus, we developed content of the assessment tool and created a rating scale of three levels of satisfaction (completely satisfied, slightly satisfied and not satisfied). The process of validation included content and language validity by experts in the field and language. **Results:** High scores according to the content validity rating were seen on both English and language versions of the CoL assessment tool by experts. Followed by a pre-testing process by participants, which showed reliability and consistency of the (CoL) variables using a multilevel analysis seeks across all individuals and all individuals had similar correlational pattern. **Conclusions:** The new (CoL) satisfaction scale have demonstrated a good capacity for identifying lifestyle factors associated with participants weight, which is a useful tool for integrative nutrition practice in weight management interventions. Future studies must be directed towards using the tool in assessing different populations and cultures to understand the main root of obesity in relation to behavior and day to day life factors.

## Keywords

Circle of Life (CoL) Satisfaction Scale, Development, Validation, Translation, Weight Management, Integrative Nutrition

## 1. Introduction

Integrative Nutrition (IN) is defined as “Integrative nutrition combines the principles of traditional nutrition guidelines and functional nutrition to provide a more individualized approach to eating and living. It goes beyond basic dietary guidelines to empower people to get more curious about how their food choices impact their unique body, which often supports them in discovering root causes for various illnesses and maladies” [1] [2]. Research has been directed towards preventive medicine and integrating holistic approaches to prevent chronic illnesses such as cardiovascular disease and obesity [3]. Thus, identifying roots and factors associated with poor eating habits and lifestyles, is essential [2]. Research have been directed toward identifying lifestyle factors associated with obesity. The Circle of Life (CoL) has been created based on the primary food concept by Joshua Rosenthal, Founder, Director, and Primary Teacher of the Institute for Integrative Nutrition describes it as follow: “turns out that the food on your plate, what I call secondary food, is not always the most important thing. Primary food overrides it, and includes a fulfilling career, nurturing relationships, an exercise routine you love, and an enriching spiritual practice”. For example, previous research has found that obesity is prevalent among working people, which may be due to long hours and sedentary lifestyle withing the offices [4]. With regards to spirituality, yoga and any other religious practices was seen to have a role in supporting behavioral changes and weight management [5]. Also, healthy relationships and maintaining strong social bonds in the community has been proved to support health and wellbeing [6]. Furthermore, physical activity and sports have been confirmed for decades to play a role in reducing stress and maintain health, which include lowering risks of obesity and metabolic syndrome. Thus is essential to enhance role of health care providers and health-coaches to enforce physical activity with their clients [7]. More importantly, diet and eating patterns as it is the ultimate goals of health and wellbeing. Findings from previous studies have shown that nutrition education has significant role in improving eating habits, for example in a study, nutrition education has supported the improving fruit and vegetables intakes among obese individuals [8]. The is still a lack of support to nutrition education among children’s schools, which may influence health in later years [9]. This can be achieved by implementing Integrative Nutrition Health coaching which has been seen. Previously to exhibit an impact on Health and wellbeing as seen previously in a pilot study [10].

Thus, assessment of Quality of life (QoL) requires specific and validated tools, which can be used to identify factors associated with obesity, such as the physical, emotional, and social well-being. This includes the Short Form Health Survey (SF-36), which measures the overall health status and (QoL) [11]. Also, the World Health Organization Quality of Life (WHOQOL) that focus on several aspects of life quality, including physical, psychological, social, and environmental domains [12]. In addition to the Impact Weight on Quality of Life (IWQOL) and the Quality of Life Inventory (QOLI) which are specific tools that assesses the impact of

obesity on various life domains, including self-esteem, physical functioning, and social interactions [13] [14]. Thus, the Weight-related Quality of Life (WRQoL) [15], which targets specific issues faced by individuals with obesity, examining how weight impacts various areas of life, such as health, self-esteem, and social interactions. These tools help clinicians and researchers evaluate the effectiveness of weight management interventions, providing a more comprehensive understanding of how obesity affects quality of life. Thus, there is no validated and Arabic translated tool that is associated with the Circle of Life component to support health coaching in weight management interventions.

The current study aimed to design an assessment tool that covers the Circle of Life Component, which we named as “Circle of Life Satisfaction Scale”, to be able to assess lifestyle factors associated with clients that want to lose weight to improve their health and lifestyle. The main objective of the study is to develop, validate and translate a newly developed assessment tool, which included content validity, data collection, reliability and consistency of the tool among participants who have joined a telenutrition weight loss program supported with telehealth coaching.

## 2. Materials and Methods

### 2.1. Study Design and Population

A randomized control trial (RCT) was conducted in the year 2023 following a published protocol [16], In the study we have recruited 25 participants to join a telenutrition weight loss program supported with weekly telemonitoring and telehealth coaching, but only 18 have retained till the end of the 6 months intervention. Inclusion criteria included, obese and/or overweight, adults with any gender. Exclusion criteria have included those that have joined a weight loss program in the past 6 months or those that are not familiar with using online applications. In the program each participant is scheduled with an online dietetic consultation to provide a hypocaloric diet for weight loss. In addition, each participant is scheduled with 6 telehealth coaching sessions by an integrative nutrition health coach to support participants with risk factors associated with their lifestyle and eating habits. By the end of each week, the Circle of Life (CoL) Satisfaction Scale was used in telemonitoring to monitor patients' satisfaction rates on a weekly basis (36 weeks). The program took place in King Fahd Medical Research Center, King Abdulaziz University, in Jeddah and Ethical approval was obtained from the Research Ethics Committee (REC) approval at the Unit of Biomedical Ethics, Faculty of Medicine, King Abdul-Aziz University (HA-02-j-008).

### 2.2. Development of the Circle of Life (CoL)

The (CoL) Satisfaction Scale tool was developed to monitor patients quality of life from an integrative nutrition perspective (<https://info.integrativenutrition.com/circle-of-life>) [1]. Thus, Circle of Life (CoL) aspects have been transferred into questions. The assessment tool aimed to measure satisfaction rates of patients in

different aspects of their life (defined as the Circle of Life). Development step focused on the following: introducing the tool; research questions; selection of rating scales [17]. Accordingly, it was decided to give patients three options to rate their satisfaction on different aspects of Circle of Life (CoL); Completely satisfied or slightly satisfied or not satisfied, which is adapted from previous research carried on telemonitoring [18]. Circle of life (CoL) aspects include, spirituality, creativity, finances, career, education, health, physical activity, home cooking, home environment, relationships, social life, and joy, which is published by the Institute of Integrative Nutrition. A color-coding system was identified to guide participants in their satisfaction ratings, based on three colors; green: completely satisfied; yellow: not completely satisfied; red, not satisfied.

### **2.3. Validation (Content and Language Validity)**

Content validity aim was to confirm that the tool content is relevant to the measured outcomes which are the circle of life satisfaction rates. In this step a draft of questions and content validity was evaluated. We have evaluated both content and language validity to ensure it is suitable to be used by obese and overweight patients following a previous study [17]. Since the assessment tool was initially developed in the English language, it was shared with a small group of experts, who have high level of English language and high level of expertise in the field of telemonitoring and integrative nutrition health coaching. The initial draft of the Assessment tool contained 12 items to be rated. The purpose of this step was to evaluate relevance, clarity, simplicity, and ambiguity by using a scale of 1 to 4, with a score of “4” used to reflect each item. If it was very relevant, very clear, very simple, and had a clear meaning, and a score of “1” used to reflect questions that were not relevant, not clear, not simple, and ambiguous. In case questions scored  $\leq 10$ , content was reviewed and modified to a clearer version of the item. Finally, pre-testing was done with two integrative nutrition health coaches to assess language and overall layout of the assessment tool.

### **2.4. Translation**

The translation step included producing two versions of the assessment tool in two languages (English and Arabic). This process including “forward- and backward-translations”, in English and then translated to Arabic by two experts in each language. Translation process aimed to preserving the original meaning and function of the Circle of Life assessment tool.

### **2.5. Statistical Analysis**

We have used two tests: Descriptive Analysis using mean, SD and frequency distribution. In addition, we used the Multilevel analysis, since every participant has repeated measures data for 36 weeks, this analysis was used to check that the association between two variables if is consistent across all participants to ensure reliability and consistency. IBM SPSS v26 was mainly used to perform the

statistical analysis.

### 3. Results

#### 3.1. Patients Characteristics

In **Table 1**, participants characteristics are demonstrated, where we had 25 participants who have joined the telenutrition weight loss study, with an average age of 32.59 years old and a BMI of 34.86, which means that the participants were obese.

**Table 1.** Patients' characteristics.

Characteristic	Descriptive value: M(SD)
Age	32.59 (10.05)
Gender	Male: 10 Female: 15
BMI	34.86 ± 6.39

M: Mean & SD: Standard Deviation.

#### 3.2. Content Validity Process

Content validity was evaluated based on experts from the field showing a score of 4 showing in both languages in Arabic and English versions (**Table 2** and **Table 3**).

#### 3.3. Circle of Life (CoL) Satisfaction Rates

Weekly percentages of (CoL) satisfaction were calculated and presented in **Table 4**.

**Table 2.** Content validity index for CoL assessment tool (English version).

Items/sections	Scoring	Improvements
Introduction to the tool: Satisfaction Question related to all items	4	NA
Cooking	4	NA
Creativity	4	NA
Education	4	NA
Fun	4	NA
Health	4	NA
Home	4	NA
Job	4	NA
Money	4	NA
Relationships	4	NA
Social Life	4	NA
Spirit	4	NA
Sports	4	NA

**Table 3.** Content validity index for CoL assessment tool (Arabic version post translation process).

Items/sections	Scoring	Improvements
Introduction to the tool: Satisfaction Question related to all items	4	NA
Cooking	4	NA
Creativity	4	NA
Education	4	NA
Fun	4	NA
Health	4	NA
Home	4	NA
Job	4	NA
Money	4	NA
Relationships	4	NA
Social Life	4	NA
Spirit	4	NA
Sports	4	NA

**Table 4.** Circle of life (CoL) satisfaction rates.

Week	Cooking	Creativity	Education	Fun	Health	Home	Job	Money	Relationships	Social Life	Spirit	Sports
1	47.83%	65.22%	69.57%	60.87%	78.26%	69.57%	50.00%	47.62%	69.57%	60.87%	69.57%	26.09%
2	66.67%	52.38%	71.43%	61.90%	85.71%	76.19%	60.00%	55.00%	57.14%	70.00%	61.90%	47.62%
3	61.90%	61.90%	76.19%	66.67%	71.43%	66.67%	60.00%	55.00%	61.90%	66.67%	76.19%	42.86%
4	50.00%	64.29%	64.29%	71.43%	85.71%	78.57%	50.00%	64.29%	71.43%	85.71%	78.57%	42.86%
5	45.00%	60.00%	70.00%	60.00%	70.00%	60.00%	52.63%	63.16%	70.00%	80.00%	60.00%	40.00%
6	44.44%	50.00%	61.11%	38.89%	72.22%	50.00%	41.18%	41.18%	61.11%	66.67%	61.11%	38.89%
7	53.33%	60.00%	66.67%	53.33%	86.67%	80.00%	42.86%	57.14%	73.33%	73.33%	80.00%	33.33%
8	50.00%	64.29%	71.43%	57.14%	92.86%	64.29%	57.14%	57.14%	78.57%	64.29%	64.29%	50.00%
9	61.54%	53.85%	84.62%	61.54%	84.62%	76.92%	66.67%	41.67%	84.62%	84.62%	92.31%	53.85%
10	62.50%	75.00%	80.00%	68.75%	75.00%	68.75%	53.33%	66.67%	75.00%	81.25%	81.25%	56.25%
11	41.67%	83.33%	83.33%	83.33%	75.00%	83.33%	54.55%	54.55%	75.00%	83.33%	100.00%	50.00%
12	53.85%	69.23%	76.92%	53.85%	92.31%	61.54%	58.33%	66.67%	84.62%	76.92%	92.31%	61.54%
13	63.64%	72.73%	81.82%	81.82%	90.91%	81.82%	60.00%	60.00%	81.82%	81.82%	90.91%	60.00%
15	55.56%	77.78%	66.67%	88.89%	77.78%	77.78%	57.14%	37.50%	66.67%	88.89%	88.89%	55.56%
16	62.50%	75.00%	62.50%	75.00%	62.50%	87.50%	42.86%	42.86%	75.00%	100.00%	87.50%	50.00%
17	71.43%	78.57%	78.57%	92.86%	92.31%	78.57%	69.23%	61.54%	85.71%	92.86%	92.86%	64.29%
18	28.57%	71.43%	100.00%	71.43%	100.00%	57.14%	66.67%	50.00%	71.43%	85.71%	85.71%	42.86%

## Continued

19	50.00%	83.33%	75.00%	66.67%	91.67%	75.00%	45.45%	45.45%	75.00%	91.67%	91.67%	58.33%
20	85.71%	71.43%	85.71%	100.00%	85.71%	85.71%	50.00%	33.33%	85.71%	100.00%	85.71%	57.14%
21	85.71%	100.00%	85.71%	100.00%	100.00%	85.71%	50.00%	66.67%	85.71%	100.00%	100.00%	85.71%
22	70.00%	80.00%	90.00%	80.00%	100.00%	80.00%	55.56%	55.56%	80.00%	100.00%	90.00%	80.00%
23	60.00%	80.00%	60.00%	80.00%	80.00%	60.00%	20.00%	20.00%	80.00%	80.00%	100.00%	60.00%
24	50.00%	83.33%	66.67%	83.33%	83.33%	66.67%	66.67%	66.67%	50.00%	83.33%	83.33%	66.67%
30	57.14%	57.14%	71.43%	57.14%	57.14%	71.43%	57.14%	42.86%	71.43%	57.14%	71.43%	14.29%
31	62.50%	100.00%	87.50%	100.00%	87.50%	75.00%	50.00%	62.50%	87.50%	100.00%	87.50%	37.50%
32	62.50%	87.50%	87.50%	87.50%	100.00%	75.00%	37.50%	50.00%	75.00%	100.00%	100.00%	62.50%
33	57.14%	85.71%	100.00%	85.71%	100.00%	57.14%	42.86%	57.14%	85.71%	100.00%	100.00%	57.14%
34	75.00%	100.00%	100.00%	100.00%	100.00%	75.00%	50.00%	75.00%	75.00%	100.00%	100.00%	75.00%
35	66.67%	100.00%	66.67%	100.00%	83.33%	66.67%	50.00%	50.00%	83.33%	100.00%	66.67%	66.67%
36	75.00%	75.00%	100.00%	75.00%	75.00%	100.00%	25.00%	50.00%	100.00%	75.00%	100.00%	25.00%
Min	28.57%	50.00%	60.00%	38.89%	57.14%	50.00%	20.00%	20.00%	50.00%	57.14%	60.00%	14.29%
Max	85.71%	100.00%	100.00%	100.00%	100.00%	100.00%	69.23%	75.00%	100.00%	100.00%	100.00%	85.71%
Trend P-value	0.030	<0.001	0.006	<0.001	0.180	0.370	0.065	0.903	0.009	0.002	0.004	0.195

This is supported by the P-value of the trend, where it's <0.05 in all these seven variables.

### 3.4. Reliability and Consistency

There is a significant consistency in the association between (CoL) variables and weight measurements across all individuals using the multilevel analysis; roughly, individuals have similar correlational pattern. Various statistics resulting from the multilevel analysis, and the most important is the P-value (sig.). This P-value aims at evaluating the significance of variance of b-coefficient in the regression of any weight measurements on any (CoL) variable (Table 5). Since all P-values are > 0.05, this indicates that the b-coefficient does not vary significantly across individuals, *i.e.*, it's consistent roughly.

## 4. Discussion

The current study aim was to design, validate a translate the Circle of Life Satisfaction Scale, to be used as a tool for integrative nutrition health coaching in weight management interventions. According to the content validity, experts in the filled and in both English and Arabic languages have scored a high score with regards to the content validity. Followed by using the Col a satisfaction scale assessment tool by participants enrolled in the study, where satisfaction rates were successfully collected. In addition, we applied a test to ensure reliability and

**Table 5.** Multilevel analysis for the association between (CoL) and weights.

Weight	CoL	Slope Variance	SE	Wald Z	Sig.	95%-CI
Weight	Cooking	7363	7364	1.00	0.317	1037-52290
Weight	Creativity	7257	7259	1.00	0.317	1022-51544
Weight	Education	7154	7156	1.00	0.317	1007-50815
Weight	Fun	7491	7493	1.00	0.317	1055-53208
Weight	Health	7032	7034	1.00	0.317	990-49954
Weight	Home	7417	7418	1.00	0.317	1044-52677
Weight	Job	7396	7398	1.00	0.317	1041-52528
Weight	Money	7360	7362	1.00	0.317	1036-52272
Weight	Relationships	7497	7499	1.00	0.317	1056-53253
Weight	Social Life	7652	7655	1.00	0.317	1077-54357
Weight	Spirit	7543	7545	1.00	0.317	1062-53581
Weight	Sports	7344	7345	1.00	0.317	1034-52156

consistency of results using the multilevel analysis and we confirmed consistency in between CoL variables and weight measurements across all individuals in a similar correlational pattern. According to previous research, several tools have been used to assess quality of life, such as the COSMIN checklist. Data obtained from the COSMIN checklist showed that Laval questionnaire is suitable for measuring the quality of life among obese patients but again in consistency with our tool it may not be suitable for all the populations, with different cultures and lifestyles [19]. Our tool was not suitable with clients who have no control on the type of cooked food at home or have no control on the time spent at work sitting in the offices. Some of our participants did not even work and made the tool not applicable in some of the Circle of Life components. Furthermore, studies have identified the development of another Quality of Life assessment tool, names as the Impact of Weight on Quality of Life questionnaire (IWQOL), which was the first self-report tool to assess effects of obesity on factors contributing to quality of life. Results showed significant differences in IWQOL-Lite scale with groups that had different body mass index, supporting the utility of the IWQOL-Lite across the body mass index spectrum. This was not seen in our study, were all our participants were obese with similar BMI measures, which suggests that we apply our tool with different groups of participants to confirm variability and association with obesity or any other chronic illnesses that have an impact on quality of life [20]. A similar tool was developed previously for dietitians, named as "Quality of Life, Obesity and Dietetics (QOLOD)" was seen to be reliable and successful to be used in clinical practice to identify effects of diet on the HRQOL of obese people [21]. However, our tool is a tool that is used to assess individuals circle of life to be able to find the root of following an unhealthy diet or poor eating patterns, which supports health coaching to support dietitians. It is also used on a weekly

basis to give participants space to reflect on their life in parallel with the diet, which is more practical and easier to apply. Thus, more tools are found to be qualified by the FDA as well, such as The Impact of Weight on Quality of Life-Lite (IWQOL-Lite), which is developed to assess weight-related physical and psychosocial factors in obese participants specifically in obesity clinical trials for product approval and labelling health claims [22]. Yet our tool is an assessment tool to support health professionals in their practice rather than using in scientific research. However, this suggests drawing more attention on the tool and test it on a larger number of populations to enable it to be used for research practices as well.

#### **Strengths and limitations**

One of the main strengths is developing the CoL Satisfaction Scale for the first time to support health professionals practice and in particularly integrative nutrition health coaching practice. It is also an easy and applicable tool that is suitable for the public and any patients from different backgrounds in two languages. Yet, this tool requires more research and to be tested with different target populations. It is essential to use it on a larger sample size that represents specific communities from different health issues to be able to draw conclusions and recommendations. With regards to the variables of the CoL Satisfaction Scale, it may be altered according to the targeted communities, for example job or education does not represent elderly populations, in addition to home cooking which may not be applicable on working clients. Thus, more interventions are required to support populations from different groups.

## **5. Conclusion**

To sum up, we have developed, validated and translated a new assessment tool to be used by integrative nutrition health coaches, which is named as the Circle of Life (CoL) Satisfaction Scale Assessment Tool. Results showed success with regards to content validity and use by participants. In addition, consistency and reliability was achieved using statistical analysis. Thus, we advise all health professionals, in particularly health coaches to utilize the tool when providing their coaching sessions to improve lifestyle to a healthier and happier approach.

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## **Conflicts of Interest**

The authors declare no conflicts of interest regarding the publication of this paper.

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