STructured Eating Plan (STEP) in Patients with Heart Failure (Pilot Study)

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Background

- Heart Failure (HF) is a significant burden on the US
- HF is associated with high morbidity and mortality
- HF outcomes are related to:
  - Patient compliance
  - Adherence to lifestyle and diet
  - Medication management
- Noncompliance with dietary guidelines is the cause of at least 20% preventable readmissions

Kollipara et al. (2008), Tsuyuki , et al. (2001), Fonarow, et al. (2008), etc

Background

- Excessive sodium intake is one of the factors associated with HF decompensation and overall morbidity
- Patients with HF have poor nutritional status
- Current recommendations for healthy diet and patients with heart failure are vague in regards to restriction of sodium intake
- Nutritional instructions are often presented as general guidelines rather than a structured, patient-specific meal strategy

Arcand, et al (2011), Frediani, et al (2013)

Significance

- ***Patent-centered , structured, and individualized meal plan*** have a potential to:

  - Lead to better adherence to healthy diet
  - Better long-term clinical outcomes
  - Improve overall nutritional state
  - Improve quality of life
  - Improve functional capacity

Aims

- Test the feasibility of a 3-month Structured Eating Plan (STEP)
- Assess the effectiveness of the intervention by measuring the nutritional outcomes
- Assess potential barriers to dietary behavior
- Assess potential barriers to adherence to the intervention

Methods

- Prospective observational pilot study
- IRB approval and informed consent were obtained
- Patient population: veteran patients with HF from subspecialty HF clinic
- Duration of the intervention: 3 months

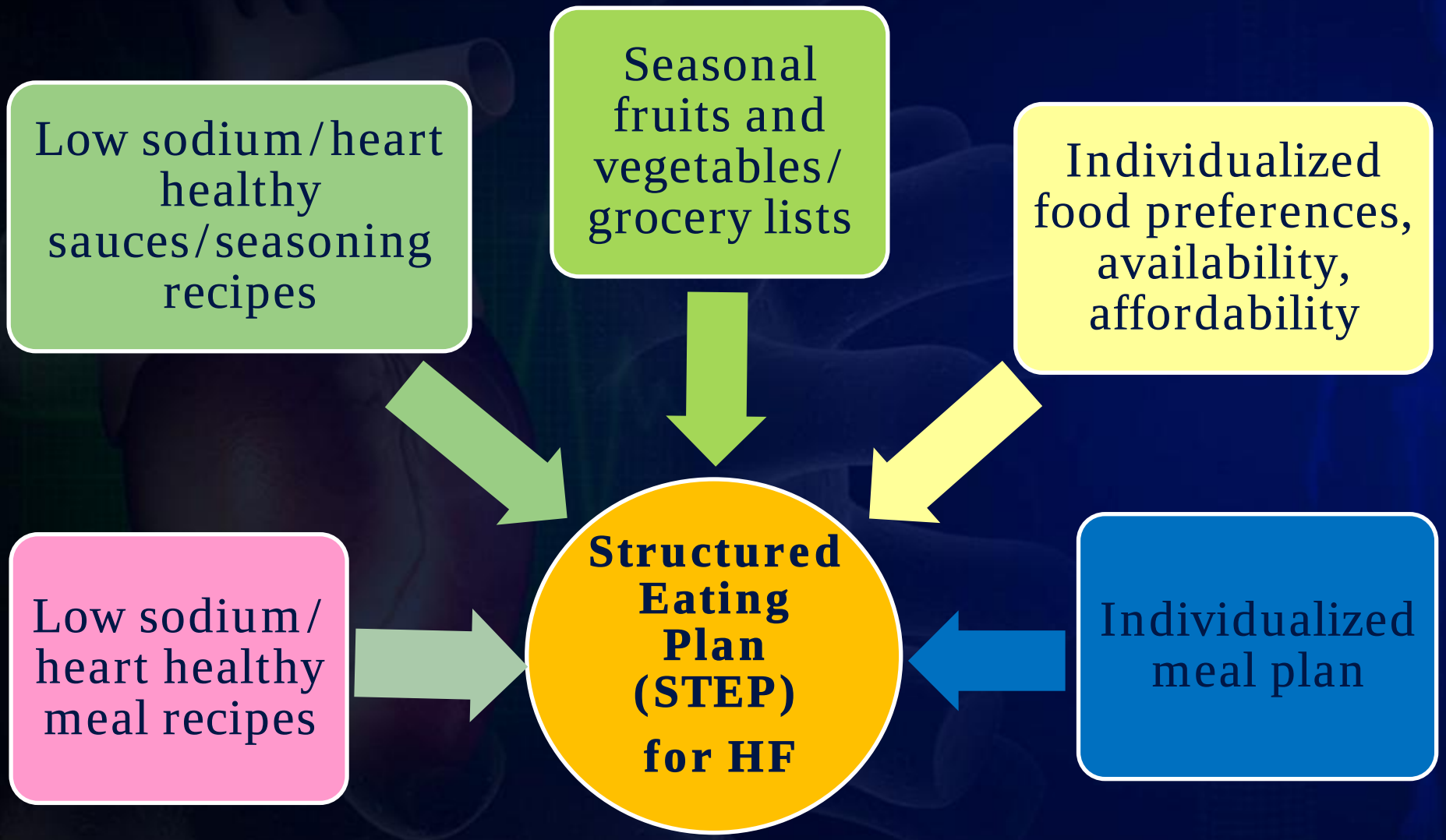
Criteria for Inclusion	Criteria for Exclusion
➢Age over 18 ➢Able to speak, read, and write English ➢Give informed consent to participate in the study ➢NYHA class II, III, IV	➢Patients who reside in Skilled Nursing Facilities permanently ➢Life expectancy is less than 6 months. ➢Patients who enrolled in a different lifestyle/diet modification program

Intervention: Assessment

- **Barrier to dietary behavior assessment**
  - Individual nutritional preferences
  - Social factors influencing dietary behavior
  - Access to healthy food
- **Meal planning assessment**
  - Where to shop
  - Available appliances and cookware
  - Food allergy
  - Personal food preference
  - Available spices, sauce or dressings at home
  - Affordable cost / week
- **3- day food records**

Intervention: STEP

- STEP Individual Sessions (3 sessions)



Intervention: STEP

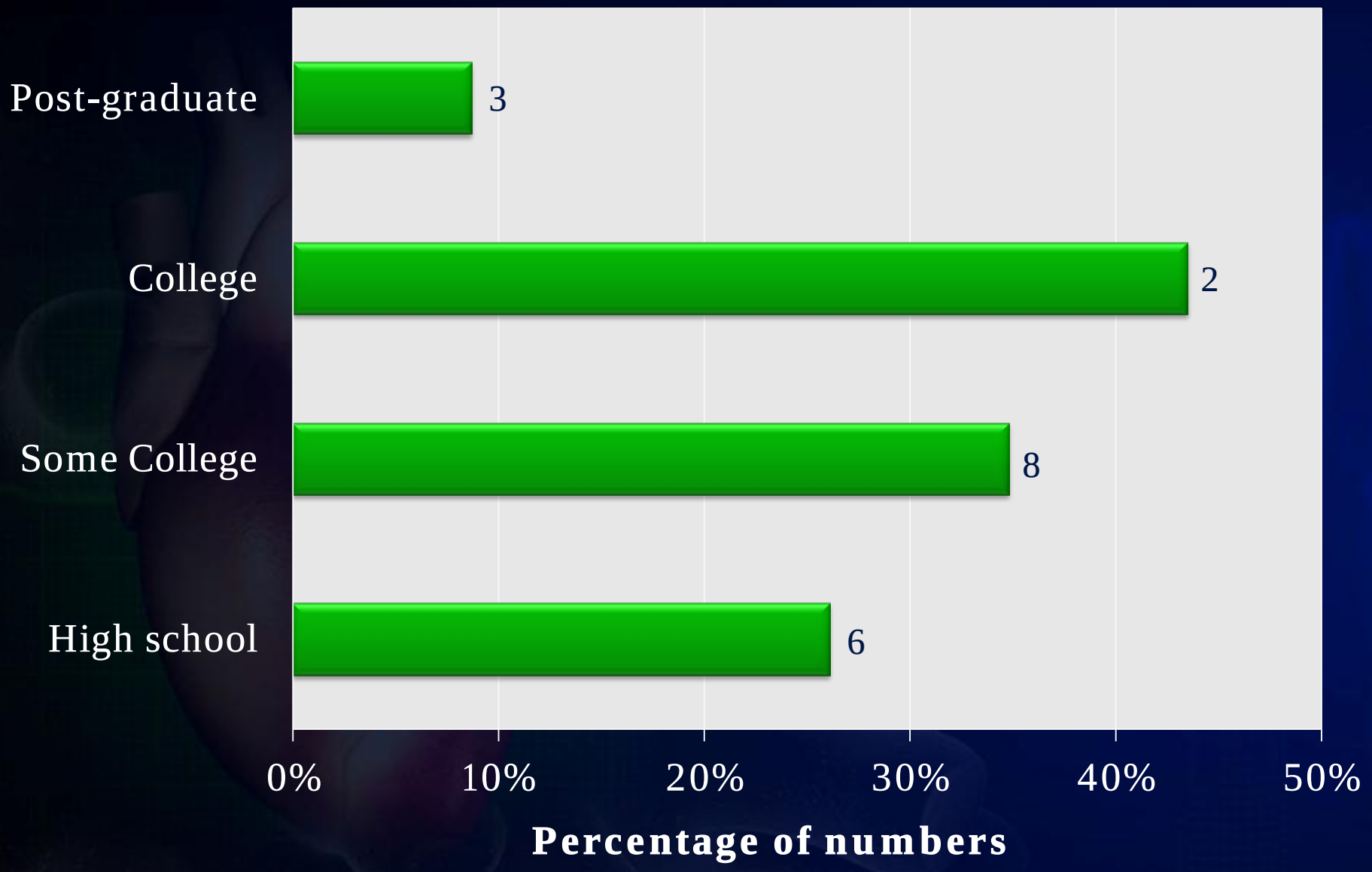
- STEP Group Sessions (3 sessions)

Data Analysis

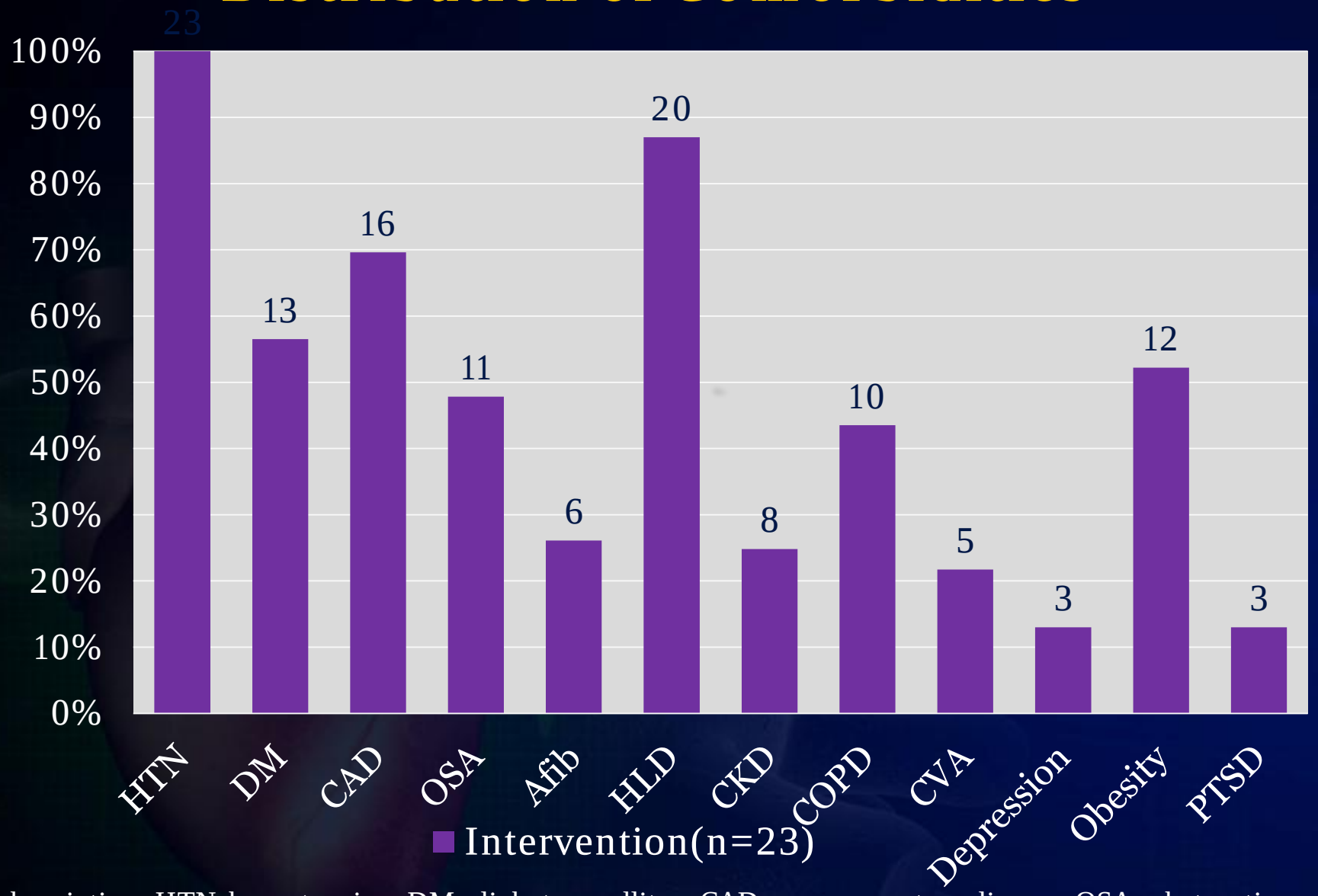
Patient Characteristics

Characteristics	N=23
Mean Age± SD (range)	63.3 ± 10.96 (39~84)
Gender, male (%)	23 (100%)
Ethnicity	
White	15 (65.2%)
Black	3 (13%)
Hispanic	5 (21.7%)
Type of HF	
Reduced LVEF HF (<40%)	17 (73.9%)
Preserved LVEF HF	6 (26.1%)
NYHA Class	
II	11 (47.8%)
III	10 (43.5%)
IV	2 (8.7%)
Living Status – Lives alone	4 (17.4%)
Perception of Financial Status affecting HF	
Yes	9 (39.15)
No	7 (30.4%)
Unsure	3 (13%)

Level of Education



Distribution of Comorbidities



Abbreviation: HTN-hypertension, DM- diabetes mellitus, CAD-coronary artery disease, OSA- obstructive sleep apnea, Afib- atrial fibrillation, HLD- hyperlipidemia, CKD- chronic kidney disease, COPD- chronic obstructive lung disease, CVA-cerebral vascular accident, PTSD- post traumatic stress disorder

Results

- ***Aim 1: Feasibility***

❑ 32 patients were screened for recruitment and 23 patients agreed to participate.

(Recruitment rate: 72%)

❑ 8 patients withdrew before the intervention

- Difficulty of transportation (n=2)
- Lack of motivation (n=2)
- Loss of contact (n=3)
- Health status change (n=1)

❑ 3 patients withdrew during the intervention

- Job status change (n=1), Health status change (n=1), & family sickness (n=1)

❑ ***Retention rate: 52%, Adherence rate: 80%***

Results

- ***Aim 2: Nutritional outcomes***

Pre and Post Paired Differences				
Lab value (*n*)	Mean Δ	SD	95% CI	*P value*
BNP (n=8)	128.3	136.7	14~242.5	0.033
Serum Cr (n=12)	-0.1	0.2	-0.19~-0.002	**0.046***
HbA1c (n=10)	0.12	0.6	-0.34~0.58	0.569
Vitamin B1 (n=6)	-40.2	35.6	-77.52~-2.82	0.040
Albumin (n=12)	-0.09	0.2	-0.15~0.13	0.900
Folate (n=8)	-265.3	369.5	-574.3~43.6	0.082
Vitamin B12 (n=9)	12.1	46.6	-23.7~47.9	0.458
Vitamin D (n=10)	3.98	7.7	-1.5~9.5	0.137
Total Cholesterol (n=10)	10.0	40.3	-18.8~38.8	0.453
Triglyceride (n=10)	21.1	39.4	-7.1~49.3	0.124
HDL (n=10)	21.1	8.24	-5.5~6.3	0.881
LDL (n=10)	5.3	29.32	-15.7~26.3	0.584
Urine sodium (n=5)	-15.0	105.6	-146.1~116	0.767
24 hr urine volume (n=5)	-48.4	676.5	-888.4~791.6	0.881

Results

- ***Aim 3: Barriers to dietary behavior***

❑ **Importance of personal preference factors:**

- Taste of food: 65.2%
- Nutrition value: 65.2%
- Sodium: 34.7%
- Cost: 39.1%
- Cooking time: 30.4%

❑ **Knowledge factors:**

- 30.4% didn't know what food to choose
- 34.8% didn't know how much food to eat
- More than 50% didn't think knowledge of how to cook or having adequate cookware improved dietary behavior
- 68.8% knew where to shop healthy food

Results

- ***Aim 3: Barriers to dietary behavior***

❑ **Socioeconomic factors:**

- 56.5% didn't think stress affects dietary behavior
- Lack of social support (56.2%), lack of family support (62.5%)
- Living alone (43.7%)
- Social events/friends (37.5%)
- Cost of food (43.8%)

❑ **Health factors:**

- Side effects from medication (62.6%)
- Other health problem (56.5%)
- HF is out of control, whether they eat right or not (56.5%)
- Don't want to risk the HF worsening from eating (68.8%)

Feedback

- ***Aim4: Barriers to adherence to the intervention***

- Hard to find low-sodium items in grocery store (36%)
- Cooking time (36%)
- Lack of support (9.9%)
- Taste (9.9%)
- Cost of food (8%)

Feedback

- ***Feedback survey results***

- 12/23 patients completed the feedback survey

- ❑ 100% found the intervention was helpful and informative
- ❑ 82% were satisfied with the amount of information, topics, and level of details
- ❑ 100% were satisfied or extremely satisfied with their experience of the study

Recommendation

Nutritional, barrier assessment

Structured, patient-specific eating plan

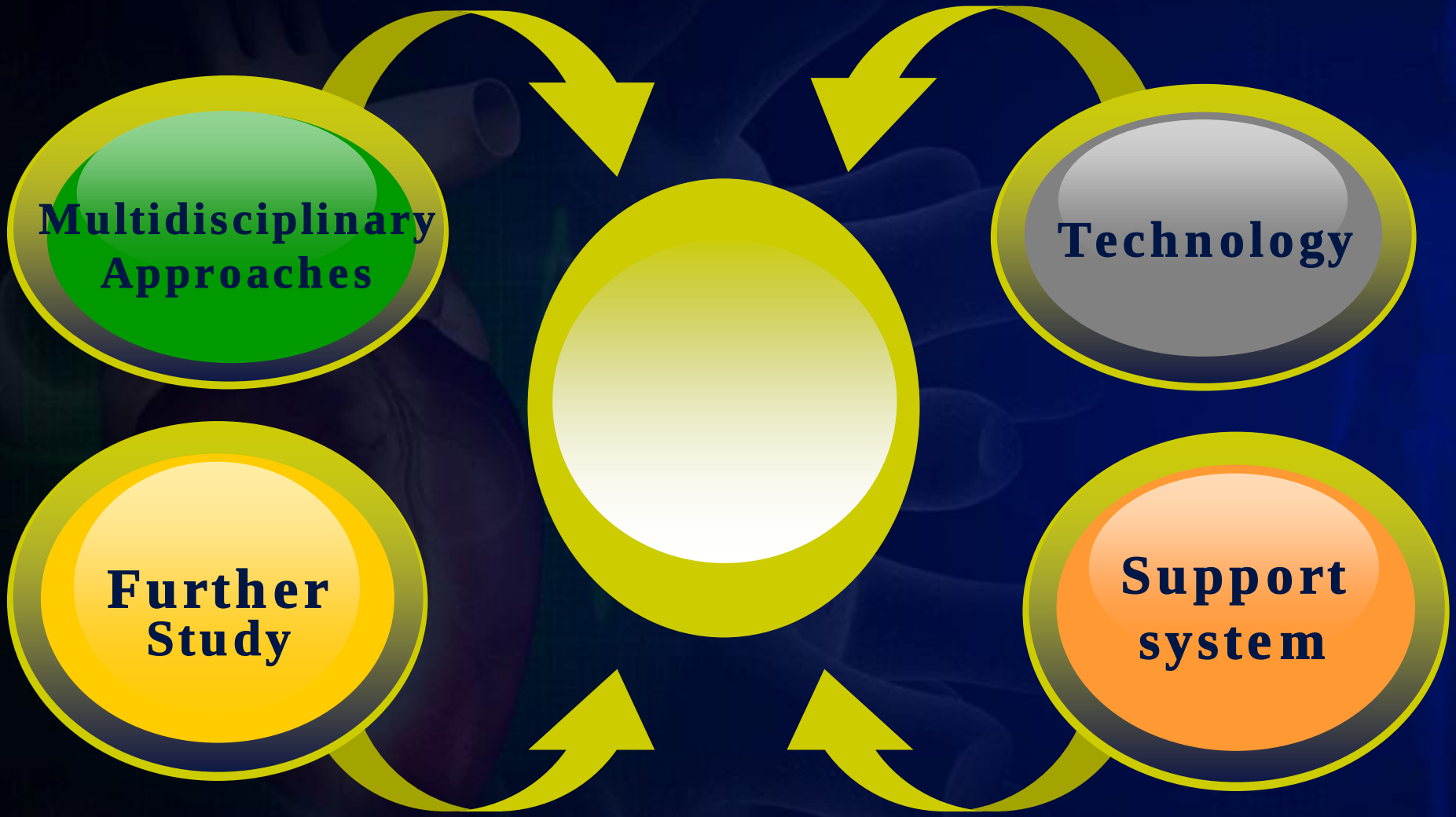
-Feasible

- High patient satisfaction

- Further investigation

- Potential benefit

Future Direction



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Thank you