



# An analysis of TR/RTTs knowledge on circular economy: informing the curriculum

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# Content



Introduction



Literature review



Survey design



Sample general descriptive analysis



Results



Final remarks



Take home messages



# Introduction

## What are circular economy and green skills?



*“CE aims to maintain the value of resources in the economy for as long as possible, using efficiently the resources through waste minimisation, reduction of primary resources, and closed loops of products.”*

Morseletto P. Targets for a circular economy. Resources, Conservation and Recycling. 2020 689 Feb;153:104553



***Green skills are “the knowledge, abilities, values and attitudes needed to live in, develop and support a sustainable and resource-efficient society”.***

OECD/Cedefop 2014



***“Green skills and competences should be understood as those skills which society and the economy need in relation to the environment.***

European Economic and Social Committee, 2020

# Introduction

## Education and training



**UNEP**  
Green Jobs

Green Jobs:  
Towards decent work in a sustainable, low-carbon world



**Publication Office  
of the European  
Union**  
An Agenda for new skills  
and jobs



**European  
Commission**  
A new skills Agenda for  
Europe



**European Economic  
and Social  
Committee**  
Towards and EU strategy  
for enhancing green skills  
and competences for all  
**European  
Commission**  
European Skills Agenda

2008

2010

2011

2014

2016

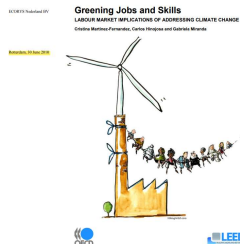
2019

2020



Programmes to promote  
environmental skills  
ECORYS

Greening Jobs and Skills  
LABOUR MARKET IMPLICATIONS OF ADDRESSING CLIMATE CHANGE  
OECD



**ECORYS**  
Programmes to promote  
environmental skills  
**OECD**  
Greening jobs and skills



Green employment  
initiative: Tapping into the  
job creation potential of  
the green economy

**European  
Commission**  
Green employment  
initiative: Tapping into the  
job creation potential of  
the green economy



The European Green Deal

**European  
Commission**  
The European Green  
Deal



# Literature review



## Aim:

- To investigate the importance and applicability of circular economy in healthcare and RT as well as the relevant aspects to include in radiographer's education.

## Method:

- Systematic search

### Databases

Scopus<sup>®</sup>



MEDLINE<sup>®</sup> Complete  
ScienceDirect<sup>®</sup>

### Other sources



**QUERY:** ("circular economy" OR "carbon footprint" OR "greenhouse emission" OR ecology OR "green skill") AND (skill OR role OR task OR training OR education OR job OR competence OR scope) AND (radiographer OR ((radiology OR radiograph OR diagnostic OR radiation) AND (technologist OR technician OR therapist)) OR Radiotherapist OR RTT OR "healthcare professional"))



# Survey



An analysis of TR/RTTs knowledge on circular economy: informing the curriculum



## Aim:



Evaluate the perceptions of TRs/RTTs regarding circular economy practices relevant to the professional practice across the EU



Identify the relevant green skills educational needs for these professionals



# Survey design – Sections



**Section I – Socio-demographic evaluation**

**Section II – GS – Knowledge**

**Section III – GS – Personal/Individual attitudes**

**Section IV – GS – TR/RTTs attitudes within the working environment / Professional group attitudes**

**Section V – GS – Perception of the importance of CE**

**Section VI – Green management and TR/RTTs engagement in CE improvements at hospital**

**Section VII – TR/RTTs perception regarding educational needs**



# Sample general descriptive analysis

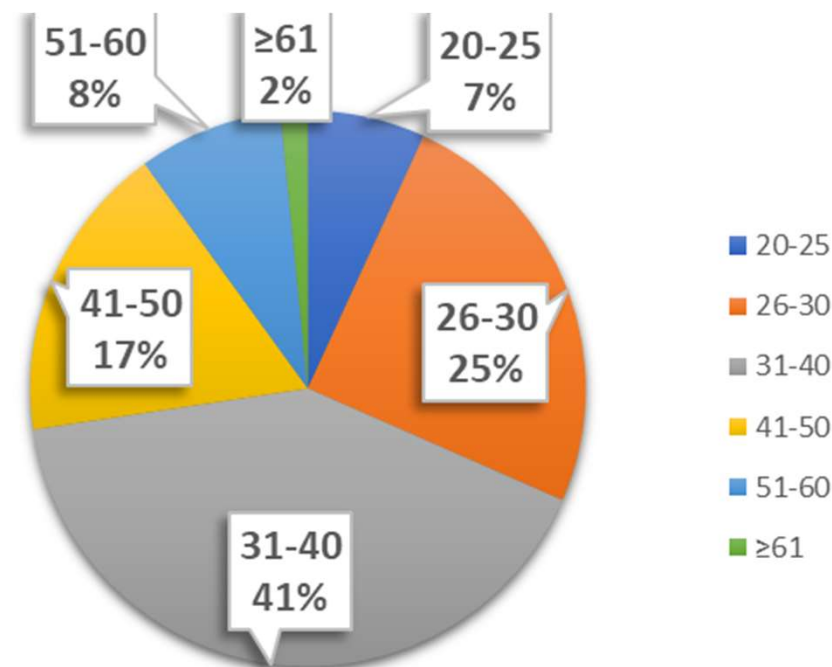


**N = 190**

## Gender ♀♂

Female	140	73.7%
Male	49	25.8%
Prefer not to declare	1	0.5%

## Age

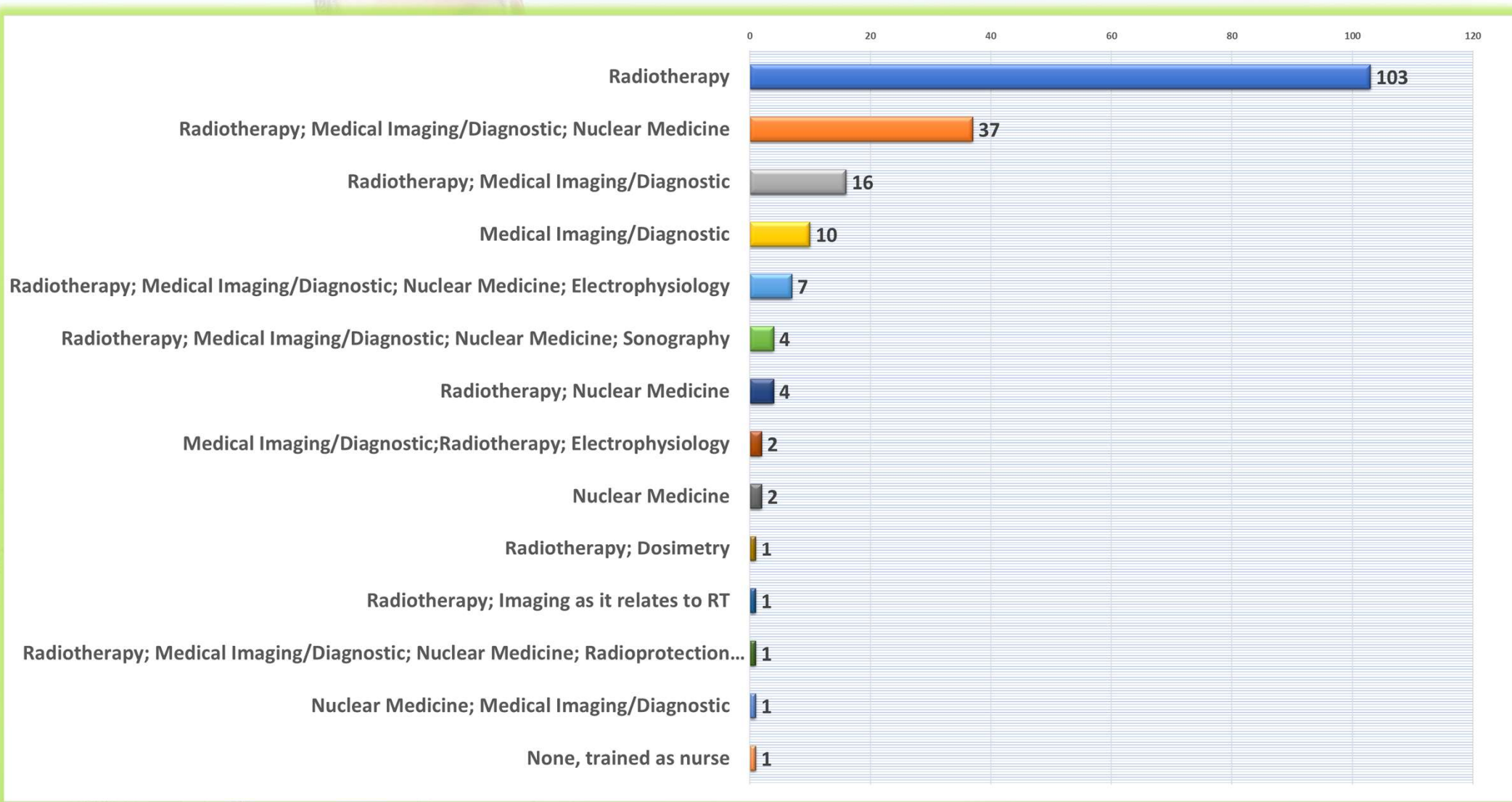




# Sample general descriptive analysis



## Area(s) of specialism included in educational training

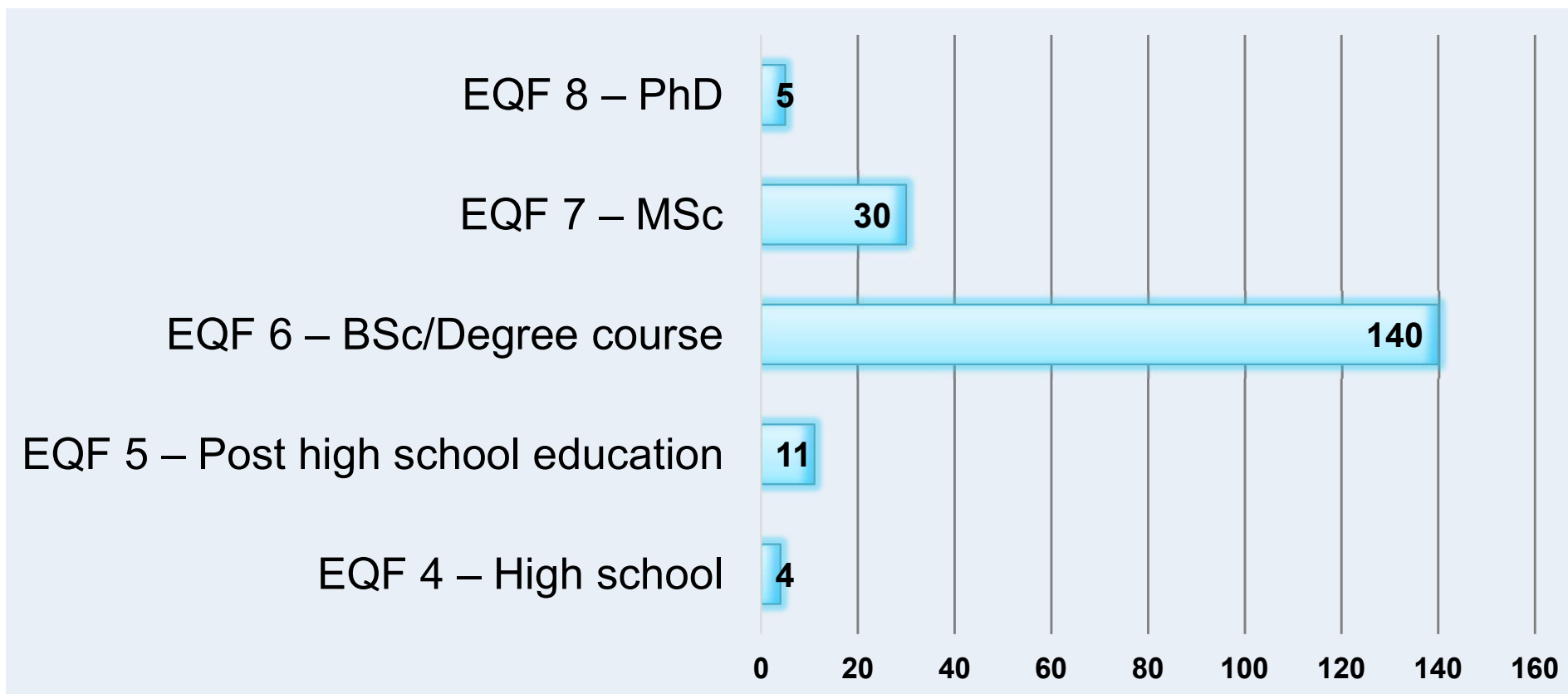




# Sample general descriptive analysis



## Academic level that allows you to practice RT

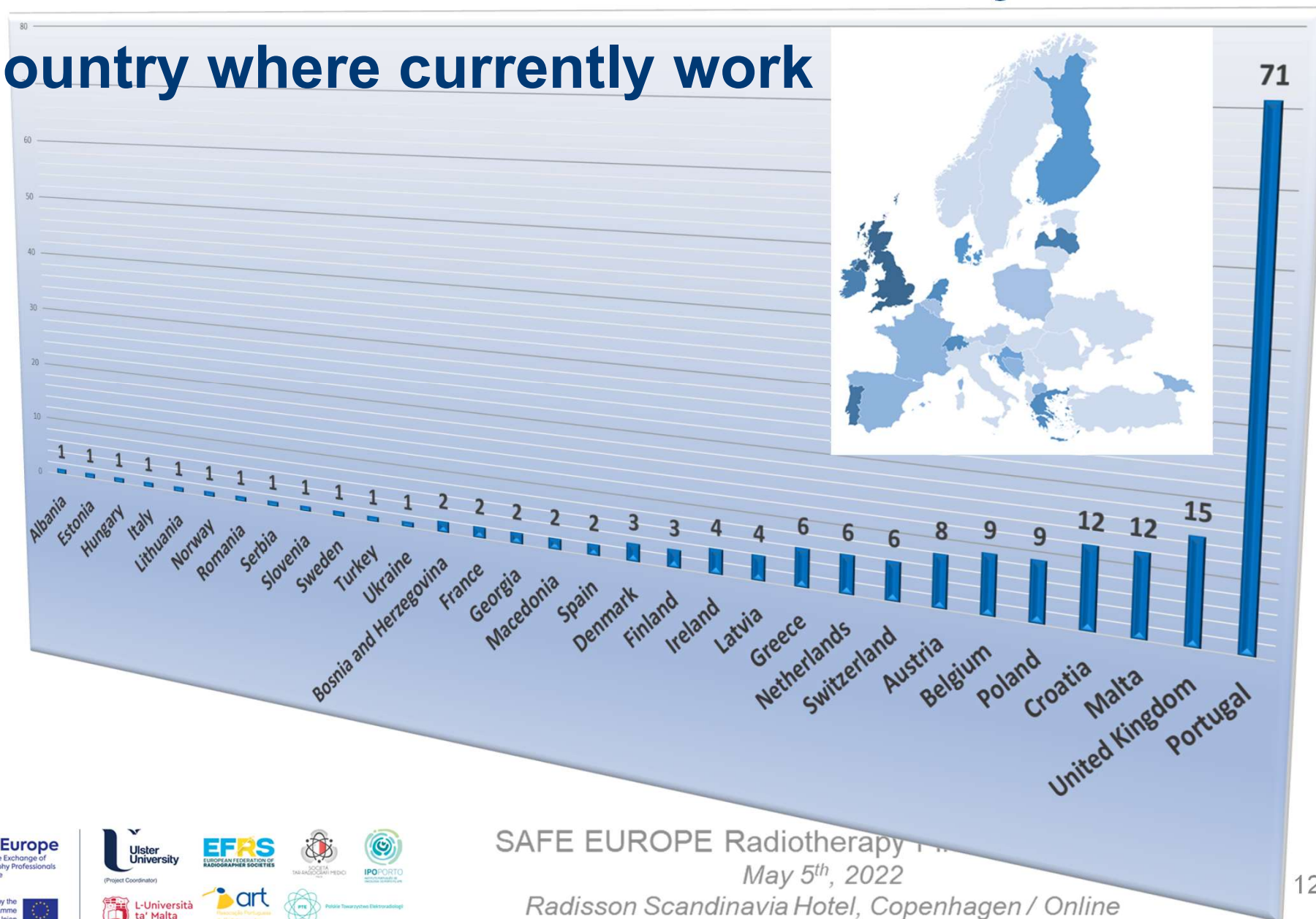




# Sample general descriptive analysis



## Country where currently work





# Sections internal consistency



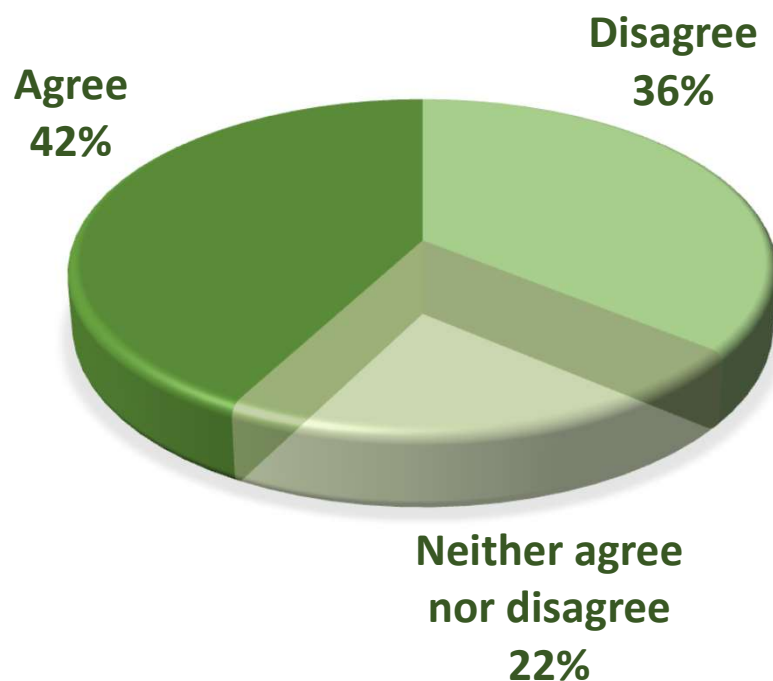
Section	Cronbach Alpha	95% CI
II	0.735	0.668-0.785
III	0.745	0.665-0.802
IV	0.819	0.760-0.860
V	0.946	0.904-0.969
VI	0.874	0.845-0.900
VII	0.894	0.847-0.923



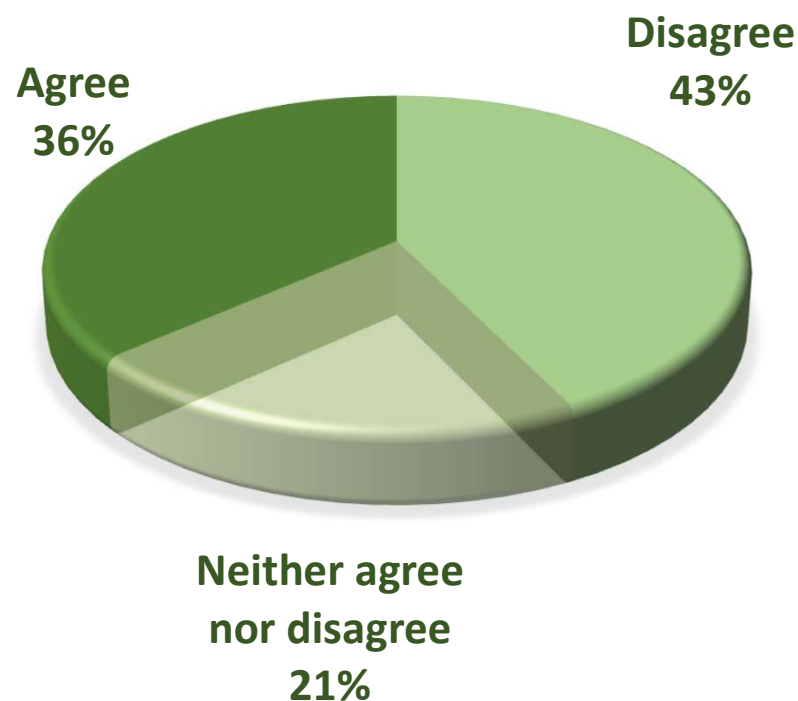
# Knowledge regarding CE and green skills



## Circular economy



## Green skills

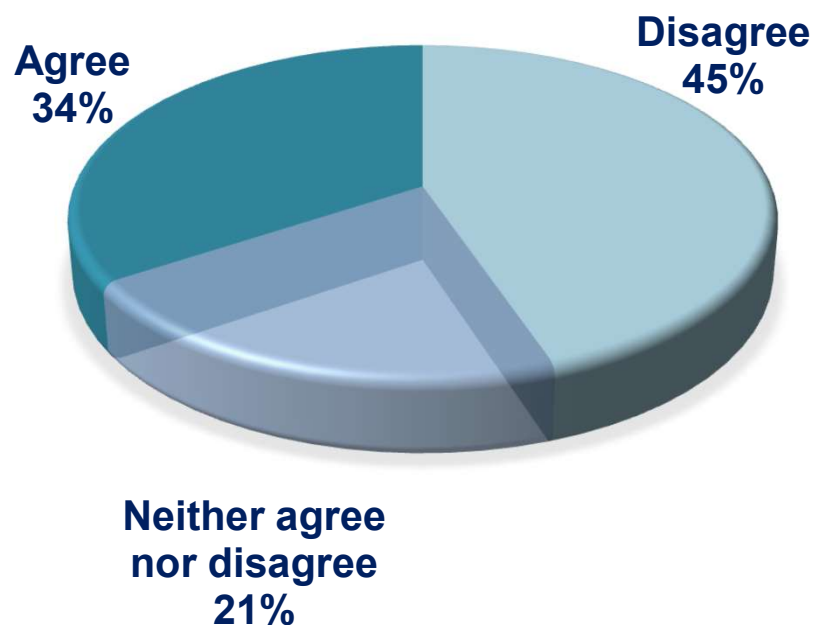




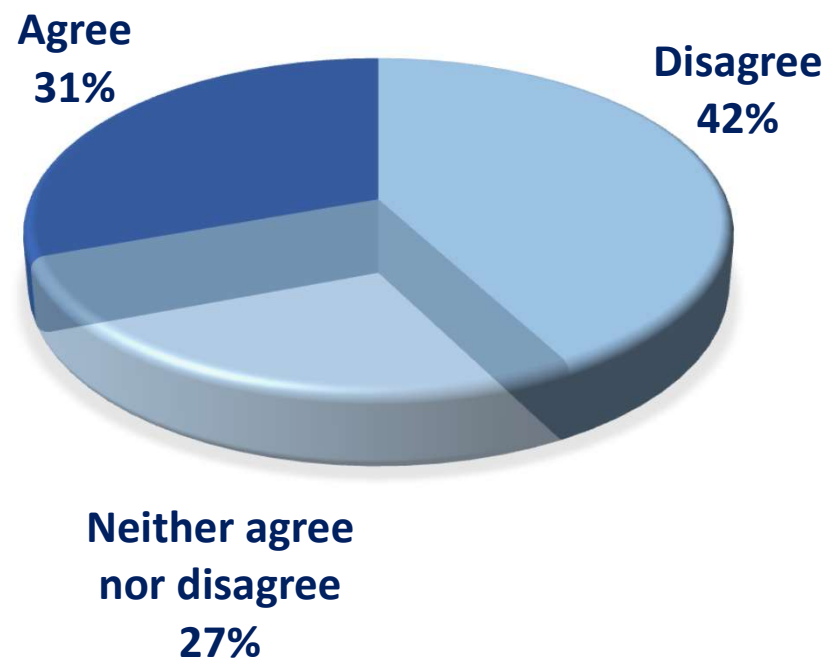
# Aware of national policies and knowledge regarding RT departmental policies encouraging CE



## National policies



## Department policies

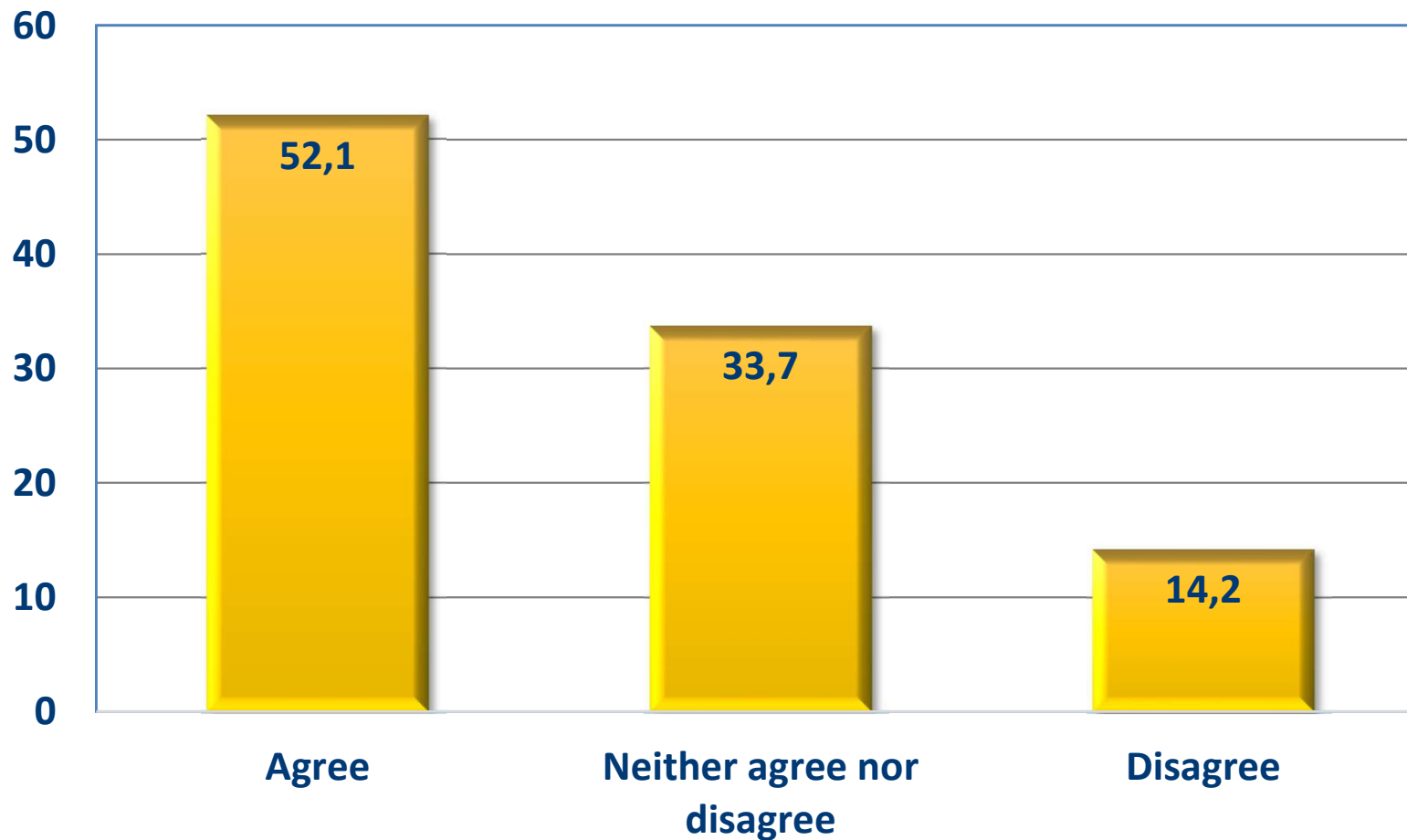




# Personal / individual attitude



- I practice CE in my daily routine





# Personal / individual attitude



- Details regarding CE practice in daily routine:
  - Answers mostly related to waste separation, recycling, and reuse



# TRs/RTTs professional group attitudes



- TR/RTTs advocate CE practices

Agree	49,5
Neither agree nor disagree	21,6
Disagree	28,9

- TR/RTTs separate waste according to the signposting provided

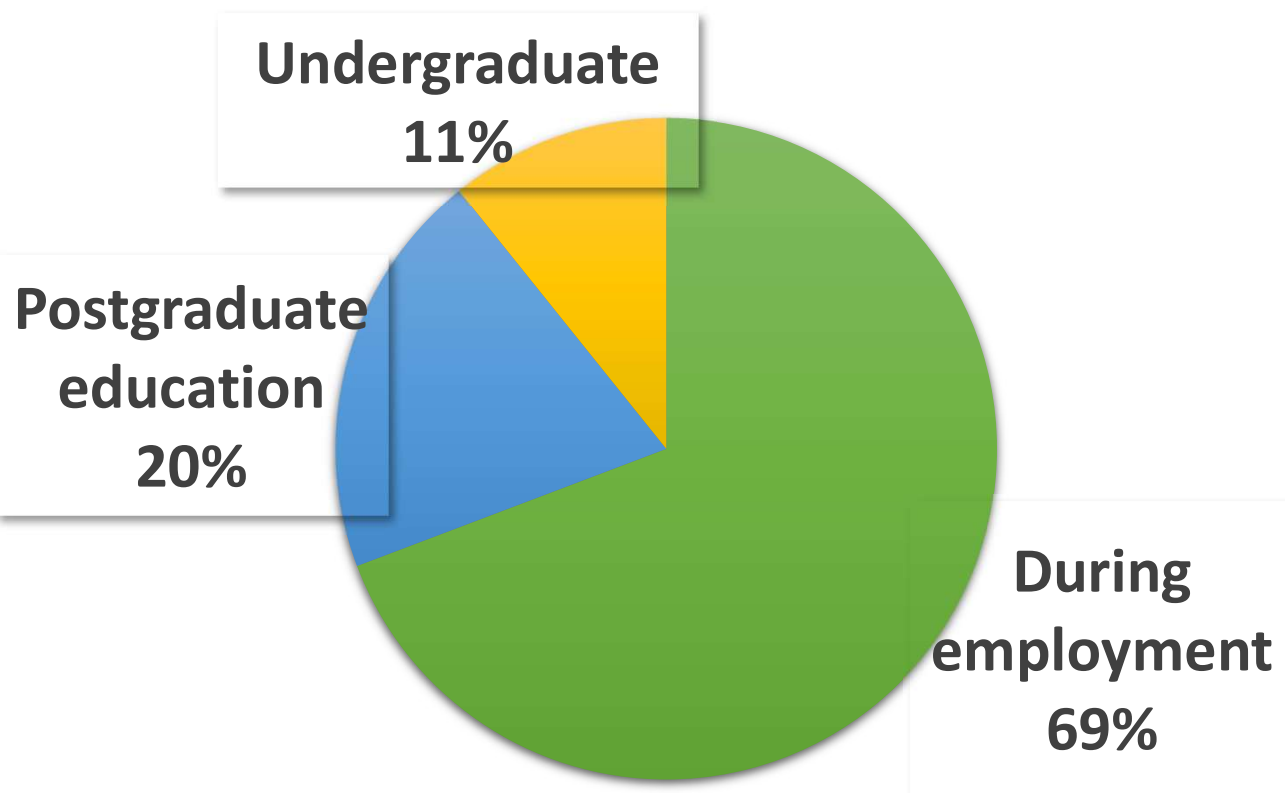
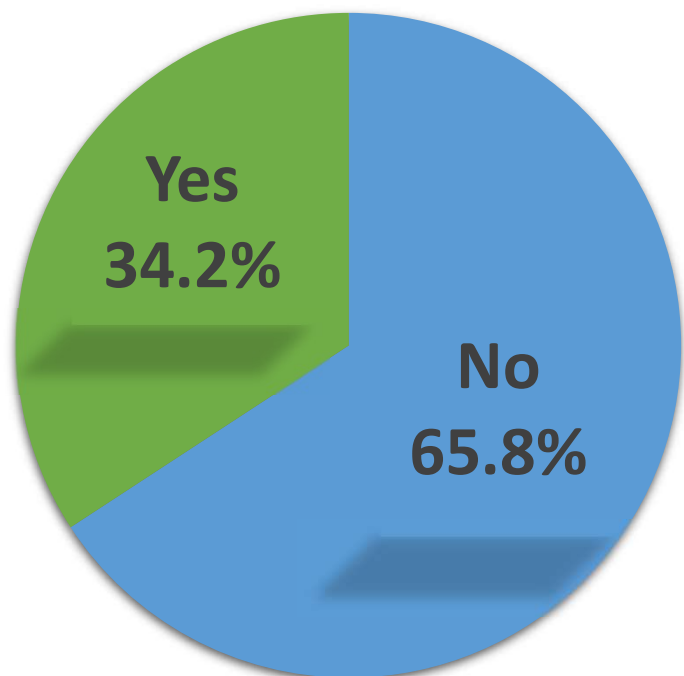
Agree	62,1
Neither agree nor disagree	13,7
Disagree	24,2

- TR/RTTs reuse some materials

Agree	66,3
Neither agree nor disagree	15,8
Disagree	17,9

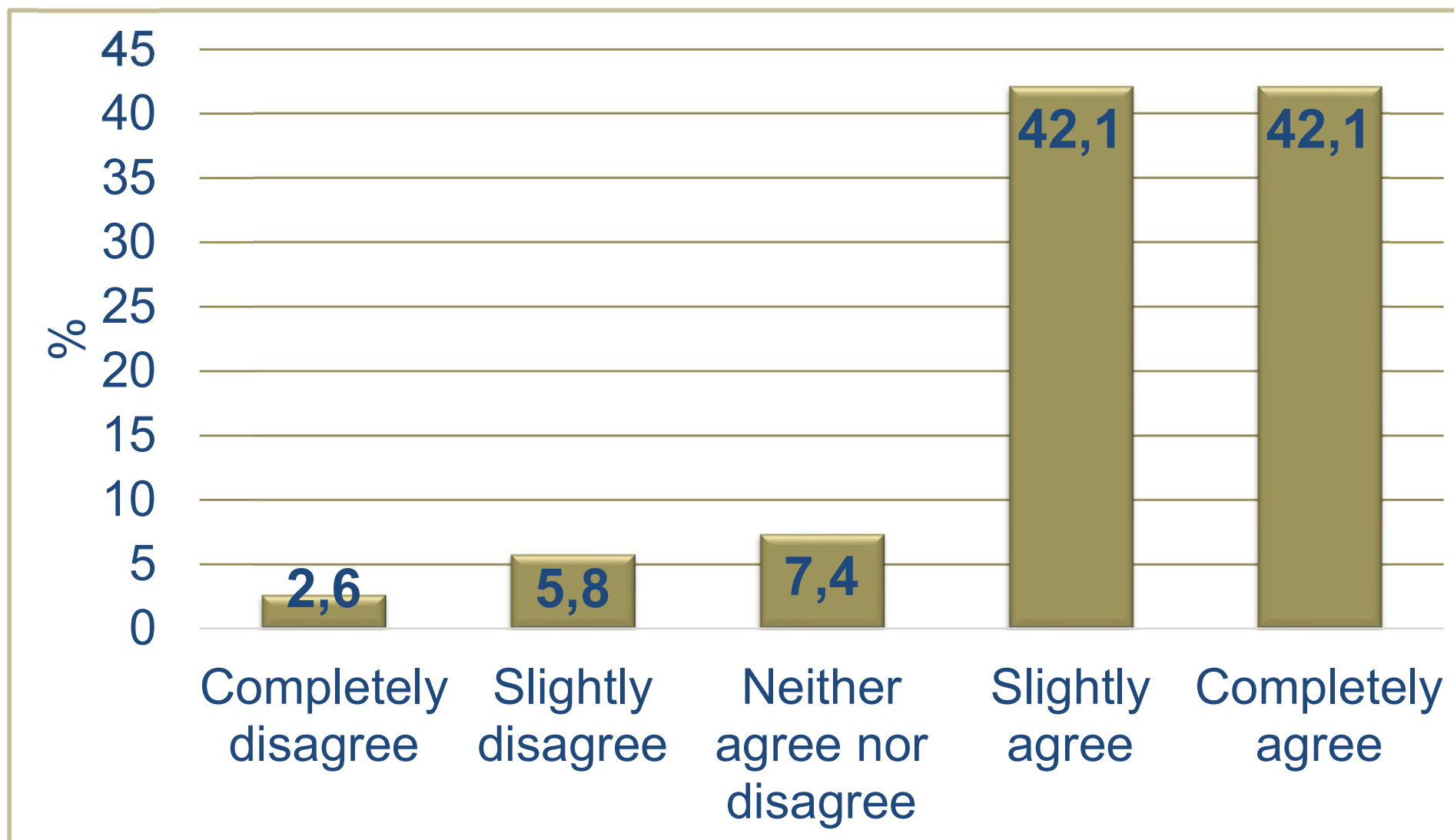


# Education and training in waste management





# Education and training in waste management

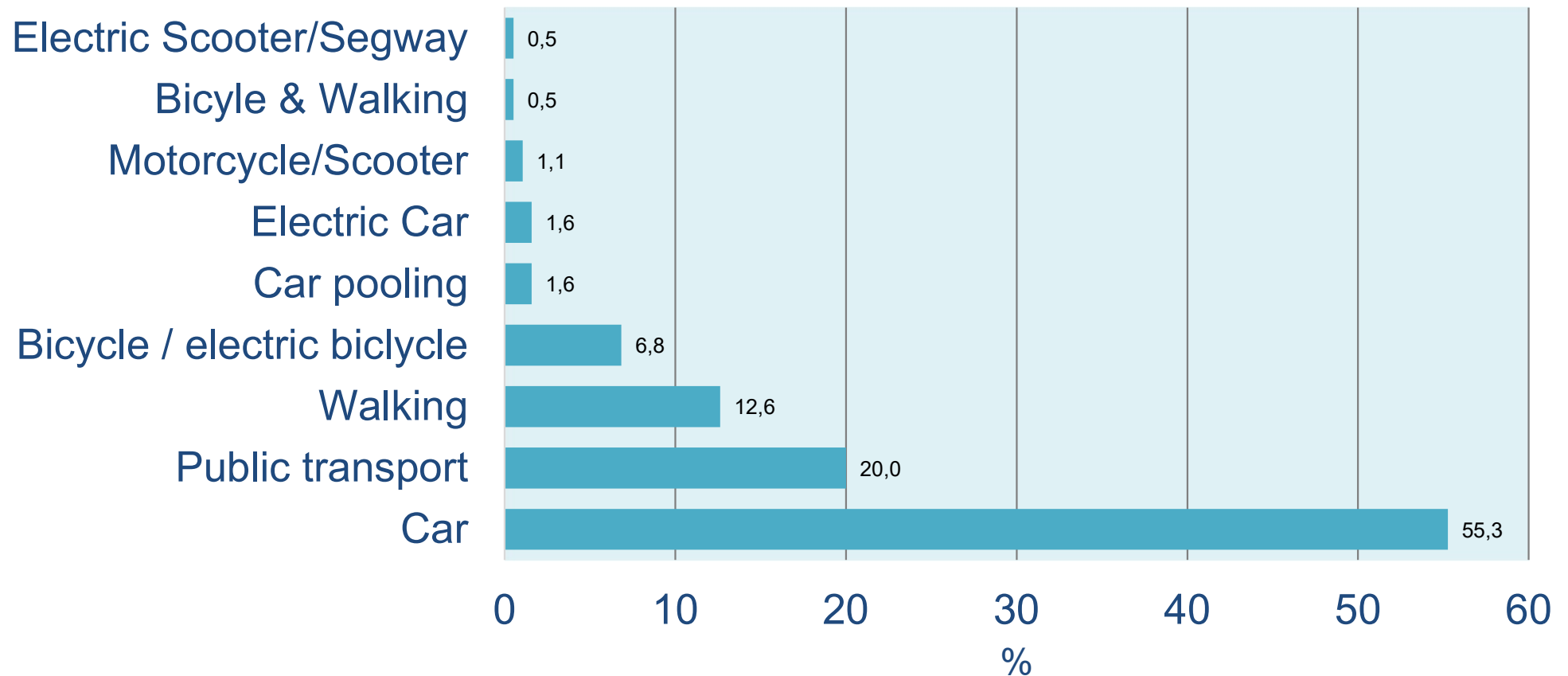




# Personal / individual attitude



- Main mode of transport

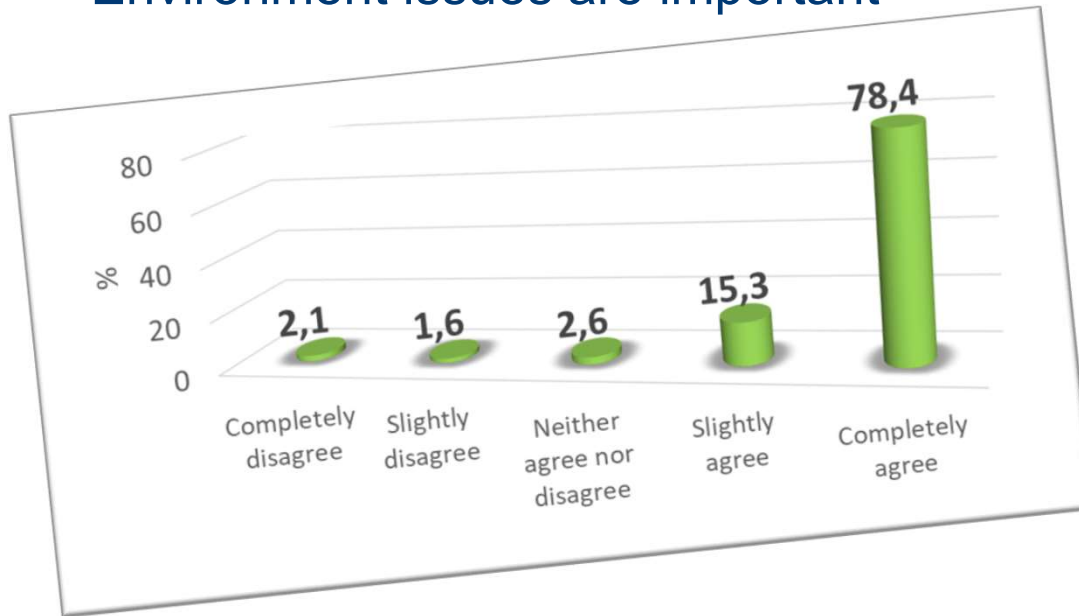




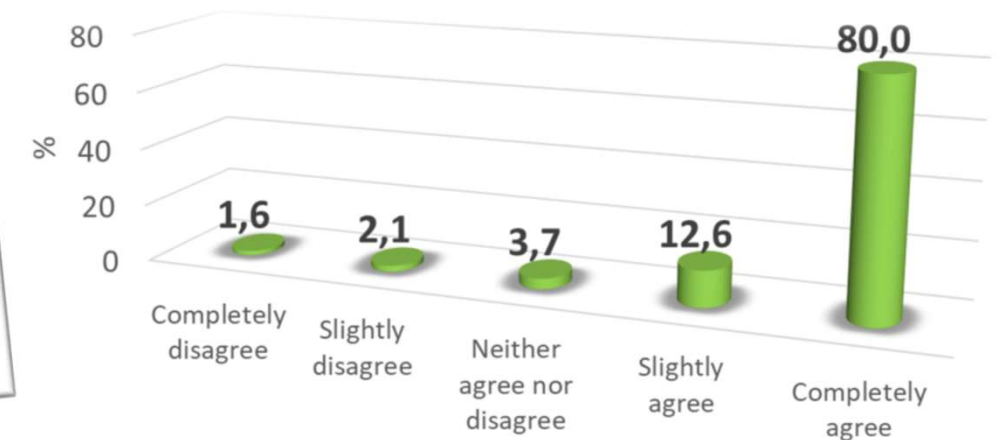
# V - Perception of the importance of CE to the environment



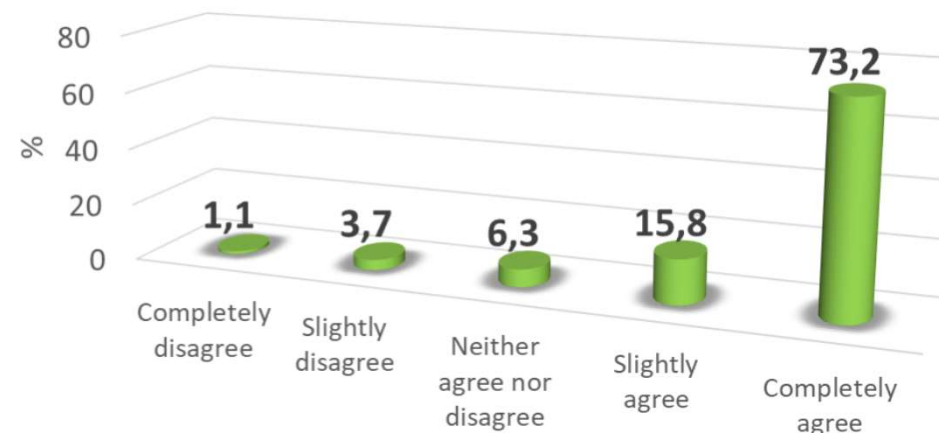
- Environment issues are important



- It is important to be conscious of the consequences of climate changes



- It is important that my hospital has environmental goals

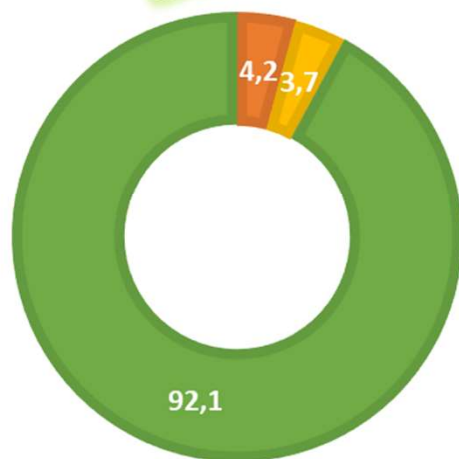




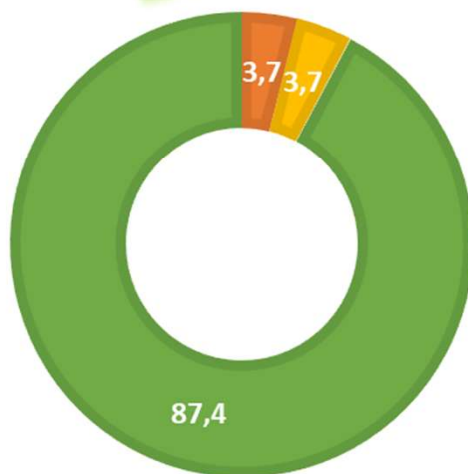
## VII – TRs/RTTs perception regarding educational needs



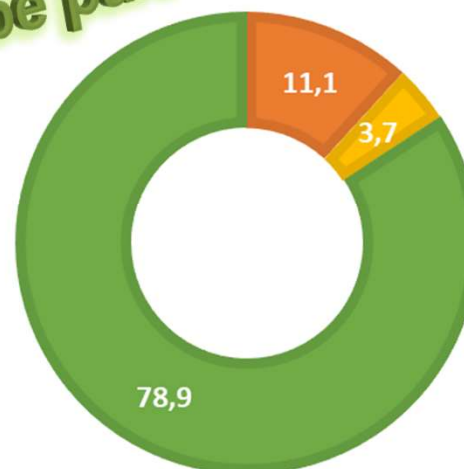
Environmental training



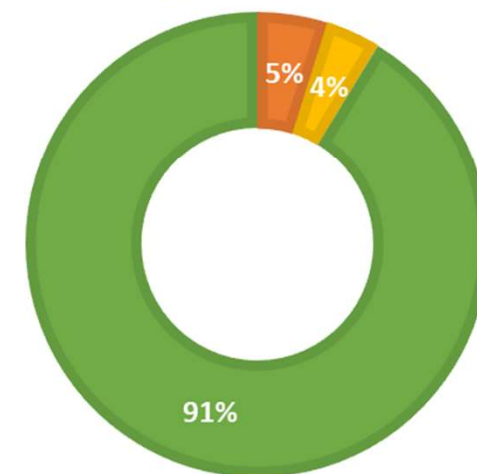
Environmental Knowledge, awareness and behavior



Green skills must be part of education



Interest in Know more about CE and GS





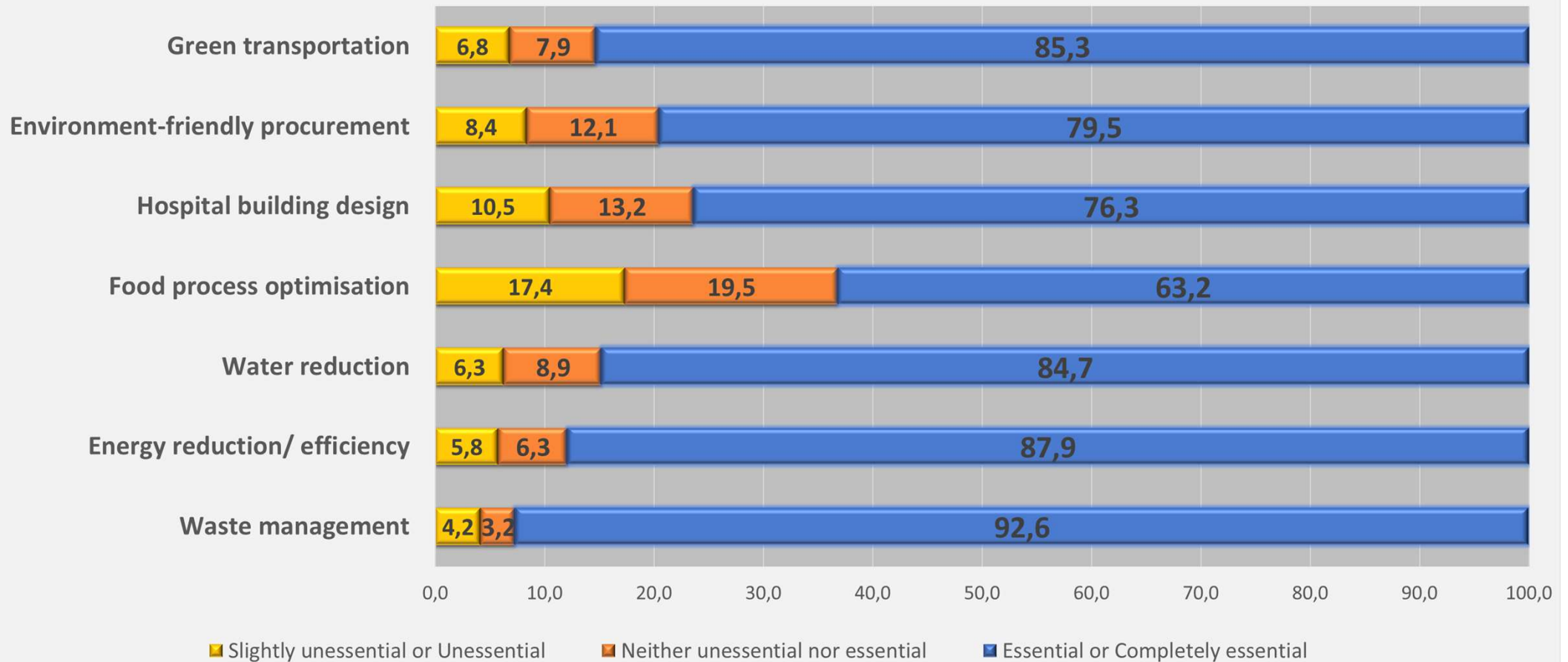
# Relationship between V – VII



		p-value
V - Perception of the importance of CE to the environment	VII – TR/RTTs perception regarding educational needs	<b>&lt;0.001</b>

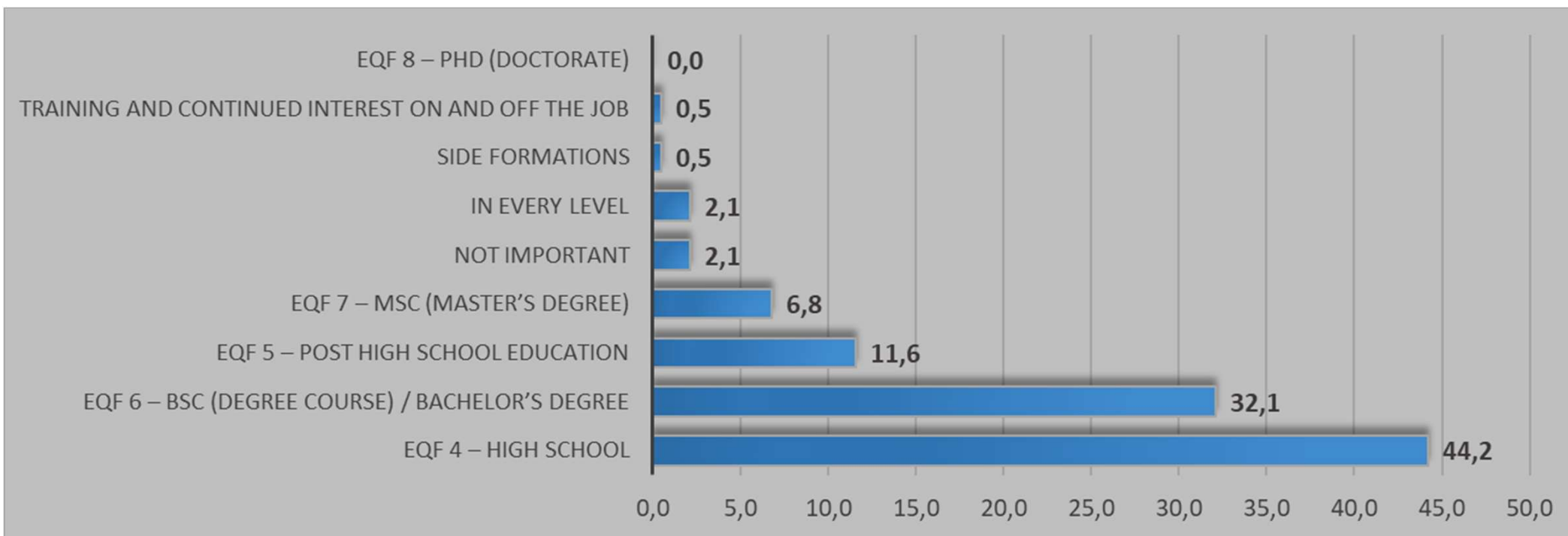


# Educational needs





# Academic level to learn about CE and green skills





# Final remarks



- Lack of awareness and knowledge regarding CE and GS
- CE daily practice:
  - 52% of the TR/RTTs' perception is that they practice CE in their daily routine
  - TR/RTTs' knowledge of waste management is high
  - TR/RTTs CE practices are mostly limited to waste management, ignoring other climate change mitigation methods



# Final remarks



- TR/RTTs considered:
  - environmental training is important
  - environmental knowledge, awareness, and behaviour must be a concern of the TR/RTTs
  - GS must be part of the TR/RTTs education
  - they would like to know more about CE and GS



# Take home messages



- **Educational needs**
  - knowledge and awareness regarding:
    - circular economy, green skills, CE daily practices
  - **Top 4 of topics to be developed:**
    - Waste management
    - Energy reduction/efficiency
    - Green transportation
    - Water reduction
- **Academic level**
  - High school and Bachelor's degree

# Achnowledgments



## Research team

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# Thank you for your attention!



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