Received: 29 June 2022 | Revised: 27 October 2022 | Accepted: 6 February 2023

DOI: 10.1111/jocn.16656

Journal of Clinical Nursing WILEY

EMPIRICAL RESEARCH QUANTITATIVE

Patient's learning needs and self-efficacy level after percutaneous coronary intervention: A descriptive study

Ricardo Salgado CCNP, MSc, Lecturer UAS[1,2] | Natércia Paulo MSc, Clinical Nurse Specialist[2] | Arnaud Zufferey RN, MSc, Nurse Manager[3] | Claudia Ortoleva Bucher RN, PhD, Full Professor UAS[1]

[1]La Source School of Nursing, HES-SO University of Applied Sciences and Arts Western Switzerland, Lausanne, Switzerland

[2]Faculty of Biology and Medicine, Institute of Higher Education and Research in Health Care (IUFRS), Lausanne, Switzerland

[3]Cardiology Service, Lausanne University Hospital, Lausanne, Switzerland

Correspondence
Ricardo Salgado, La Source School of Nursing, HES-SO University of Applied Sciences and Arts Western Switzerland, Avenue Vinet 30, Lausanne 1004, Switzerland.
Email: r.salgado@ecolelasource.ch

Abstract

Aims and Objectives: Identify and compare learning needs, levels of self-efficacy and their association among inpatients and outpatients of a cardiac care unit with coronary heart disease who have undergone percutaneous coronary intervention (PCI) in a Swiss university hospital.

Background: After primary PCI, 42% of patients will suffer a recurrent ischemic cardiovascular event. Although adherence to therapeutic regimen contributes to prevent recurrence, patient adherence remains low. To strengthen it, learning needs and self-efficacy must be considered when developing effective therapeutic patient education (TPE).

Methods: Learning needs and self-efficacy were assessed using the Cardiac Patient Learning Needs Inventory (CPLNI) and the Cardiac Self-Efficacy Scale among inpatients and outpatients. The STROBE checklist for cross-sectional studies was used in reporting this study.

Results: Ninety-three patients participated in the study with a participation rate of 73.9%. The CPLNI median total score was significantly higher in inpatients than in outpatients: 4.23 (3.82, 4.64) versus 3.67 (3.33, 4.09), $p < .001$. In both units, participants declared that the most important need was related to 'anatomy and physiology' of the heart. Despite the high score, the least important need was about 'physical activity' for inpatients and 'miscellaneous information' for outpatients. No statistically significant differences were found among patients from both units regarding their self-efficacy level.

Conclusions: This study shows that after PCI, patients have high learning needs and moderate levels of self-efficacy that require addressing.

Relevance to Clinical Practice: Patient's individual learning needs and self-efficacy level must be assessed prior/after PCI. A tailored TPE that considers individual learning needs and self-efficacy is recommended as a preventative measure to reduce recurrent ischemic cardiovascular events. Nurses can play a key role in this process.

No Patient or Public Contribution: For feasibility reasons, patients and public were not involved in the design, conduct, reporting or dissemination plans of this research.

KEYWORDS
coronary artery disease, learning needs, myocardial ischemia, myocardial revascularization, percutaneous coronary intervention, self-efficacy, therapeutic patient education, TPE

1 | INTRODUCTION

Coronary artery disease (CAD) accounts for 43.8% of deaths worldwide among patients with cardiovascular disease (CVD) ACC, 2018; WHO, 2017). One in three deaths is caused by acute myocardial infarction (AMI) Benjamin et al., 2017). Percutaneous coronary intervention (PCI) is often the first line of treatment for AMI (Mosleh et al., 2017). Nevertheless, at 10 years, around 42% of patients will suffer a recurrent ischemic cardiovascular event; in most cases recurring within a year (Huynh et al., 2018). This has a significant impact on patient mortality, rehospitalization and consequently health costs (Huynh et al., 2018). In order to reduce the risk of recurrence, it is important for patients post-PCI to adhere to a tailored therapeutic regimen (Arnett et al., 2019; WHO, 2017). However, adherence to recommendations remains low (Clark et al., 2012; Rodriguez et al., 2013). About 50% of patients do not participate in cardiac rehabilitation programs and 30%–60% independently cease their medication (Clark et al., 2012; Rodriguez et al., 2013). The causes usually evoked for this include low level of patient self-management, low level of patient health literacy, low patient sense of self-efficacy and poor patient knowledge of disease (Huriani, 2019; Kilonzo & O'Connell, 2011; Mayberry et al., 2018; Weibel et al., 2014). This reality reinforces the perception that educational interventions should be a priority but are probably not as effective as they could be. According to the literature, this lack of effectiveness is due to the fact that health professionals have limited knowledge and understanding of the information that patients consider important, patient sense of self-efficacy and patient level of health literacy after an acute event (Cheng et al., 2015; Ghisi et al., 2018; Greco et al., 2016; Slovinec D'Angelo et al., 2014). Moreover, the fact that hospital stays are reducing means that health professionals have a smaller window within which to deliver tailored educational interventions (Cheng et al., 2015; Ghisi et al., 2018; Greco et al., 2016).

What does this paper contribute to the wider global clinical community?

- PCI patients have major and individual learning needs.
- PCI patients present a moderate self-efficacy level.
- Tailored therapeutic patient education programs need to be developed to better meet the needs of patients with coronary heart disease who have undergone PCI to prevent recurrence.

2 | BACKGROUND

The purpose of therapeutic patient education (TPE) is to promote the maintenance and/or acquisition of skills required by patients with a chronic disease to better manage their lives (WHO, 1998). The first step in designing a TPE program is understanding the learning needs of patients at hospital admission in order to be able to meet those needs (Pavy et al., 2013). According to Knowles et al. (2015), learning needs represent the gap between what exists and what is required in terms of knowledge and skills. Nurses are the practitioners best positioned to understand these needs (Lu et al., 2019; O'Brien et al., 2013; Timmins, 2005b). They hold a privileged place at the patient's bedside and have the education knowledge and communication skills to conduct an educational intervention successfully (Déry et al., 2017; Mosleh et al., 2017). Furthermore, this is an integral part of their specific role and of their field of competence (Déry et al., 2017).

According to the literature, the learning needs of patients are both varied and very personal (Aazami et al., 2016; Eshah, 2011; Greco et al., 2016; Kilonzo & O'Connell, 2011; Mosleh et al., 2016, 2017). They may also change over time (Greco et al., 2016). Studies show that the most important post-PCI learning needs concern wound care, medication, physical activity, risk factors, heart anatomy and physiology and possible complications (Aazami et al., 2016; Eshah, 2011; Greco et al., 2016; Kilonzo & O'Connell, 2011; Mosleh et al., 2016, 2017). The least important concern diet, CAD and the intervention undergone, community support and physical activity (Aazami et al., 2016; Eshah, 2011; Greco et al., 2016; Kilonzo & O'Connell, 2011; Mosleh et al., 2017). Oddly, physical activity is thus among both the most and the least important needs (Huriani, 2019; Kilonzo & O'Connell, 2011). It needs to be highlighted that the more recent literature on patient post-PCI learning needs has been generated mostly by studies conducted in Asian and Middle Eastern populations (Aazami et al., 2016; Eshah, 2011; Greco et al., 2016; Huriani, 2019; Kilonzo & O'Connell, 2011; Mosleh et al., 2016, 2017). Consequently, their findings should be applied to Western countries with caution given the differences in cultures, socio-economics and health and social service systems.

Alongside learning needs, it is essential to assess to what extent patients feel capable of adopting new behaviours, that is, their sense of self-efficacy (Fors et al., 2016; Slovinec D'Angelo et al., 2014;

Weibel et al., 2014). According to the literature, CAD patients present a moderate self-efficacy level (Kang & Yang, 2013). Levels for those with unstable angina or AMI are lower (Kang & Yang, 2013). Considered a strong predictor of therapeutic regimen adherence (O'Neil et al., 2013), self-efficacy can be positively influenced by educational interventions (Vibulchai et al., 2016; Weibel et al., 2014; Zhang et al., 2018).

Numerous CVD educational programs have been developed across the globe (AHA, 2022; ESC, 2022; Gomes et al., 2021; HUG, 2021). However, their effectiveness in bolstering adherence particularly in the long-run lacks clear evidence (Carballo et al., 2019; McClellan et al., 2019). Possible reasons for this are: (1) educational interventions do not completely consider the immediate post-PCI learning needs and self-efficacy level of each patient. Programs have often been developed on the basis of expected needs rather than real ones (Eshah, 2011); (2) post-PCI, patients often feel like they did before their diagnosis of acute coronary syndrome (ACS). This situation prevents a real awareness of the severity of the event experienced and consequent changes in behaviour (Ravn et al., 2022); (3) experiencing medication side effects (Ravn et al., 2022); and (4) difficulty in reconciling private life and rehabilitation programs (Ravn et al., 2022). It is important to underscore, also, that patients most often experiencing this problem are those who had non-ST-segment elevation myocardial infarction (NSTEMI; Rodrigo et al., 2021). They seldom participate in post-hospitalisation rehabilitation programs, and this reduces educational opportunities even more and raises the risk of recurrence (Rodrigo et al., 2021).

Therefore, it is essential to further our knowledge of learning needs and self-efficacy levels of CAD patients in the immediate post-acute phase after PCI. Consequently, the aims of this study were to: (1) identify the learning needs of CAD patients who underwent PCI less than 1 week earlier in the inpatient or outpatient cardiology unit of a Swiss university hospital; (2) assess the self-efficacy level of these patients; and (3) examine the relationship between sociodemographic/clinical variables, patient-reported learning needs and patient self-efficacy level.

The research questions of this study were: (1) What are the learning needs of CAD patients who underwent PCI less than 1 week earlier in the inpatient or outpatient cardiology?; (2) What is the self-efficacy level of these patients?; and (3) Is there any relationship between sociodemographic/clinical variables, patient-reported learning needs and patient self-efficacy level? If yes, what kind? Answering these questions can help the development of a tailored educational program and ultimately, decrease recurrences by improving the quality of care.

The study was underpinned by the Cardiac Patient Education Framework developed by Timmins (2005a). This model offers support for developing TPE interventions in four basic steps: assessment, planning, implementation and evaluation (Figure 1; Timmins, 2005a). The study sought to deepen our knowledge of the first step.

3 | METHODS

3.1 | Study design and setting

This descriptive correlational study was conducted in the inpatient and outpatient cardiology units of a Swiss university hospital where 2100 PCIs per year are performed on average. Usually, acute patients stayed in the inpatient unit and less acute patients in the outpatient unit. The university hospital had a ST-elevation myocardial infarction (STEMI) fast track to handle emergency situations, which considerably diminished the intake time for patients with STEMI. The Strengthening the Reporting of Observational Studies in Epidemiology checklist (STROBE) was used in reporting this study (File S1).

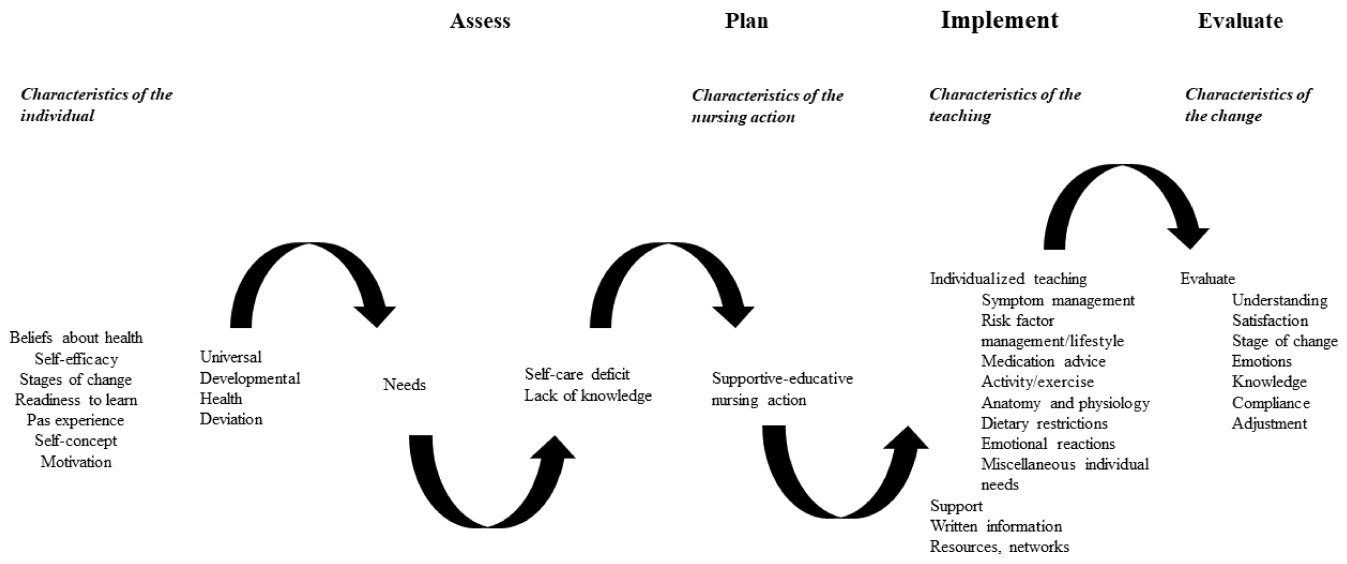

FIGURE 1 Cardiac patient education framework (Timmins, 2005a).

3.2 | Participants

The eligible population for this study in both inpatient and outpatient units was 157 patients. Inclusion criteria were: (1) being diagnosed with CAD (acute coronary syndrome or stable angina); (2) less than 7 days post-PCI; (3) understand and speak French; and (4) being able to give informed consent. Exclusion criteria were: (1) the presence of a health condition that impairing the capacity to give consent, confirmed by the nursing team; and (2) the presence of a short-term life-threatening situation also confirmed by the nursing team.

3.3 | Data collection

Following ethics approval of Vaud Ethical Committee, data collection took place between November 2019 and February 2020. During this period, a list of eligible patients for the day was generated by head nurses from both units. Researchers presented the study to eligible patients and after informed consent and anonymization procedure, the self-administered questionnaires were distributed. When completed, questionnaires were sealed in an anonymous and opaque envelope and placed in a specific mailbox located in each unit.

3.4 | Instruments

Data were collected through three questionnaires: a sociodemographic and clinical questionnaire, the French version of the Cardiac Patient Learning Needs Inventory (CPLNI; Gerard & Peterson, 1984), and the French version of the Cardiac Self-Efficacy Scale (CSES; Sullivan et al., 1998).

The sociodemographic questionnaire was developed for our study based on a review of the literature concerning the learning needs of PCI patients (Eshah, 2011; Greco et al., 2016; Huriani, 2019; Kilonzo & O'Connell, 2011; Mosleh et al., 2016, 2017). It covered age, gender, employment status, academic achievement levels, main resource person at home and lifestyle habits, such as tobacco and alcohol use, physical activity and diet. It also served to uncover whether patients received TPE regarding CVD and PCI, reason for hospitalisation, medical history, whether this was their first hospitalisation and whether this was their first PCI. The concept of TPE was explained to patients when handed the questionnaire.

Developed and validated by Gerard and Peterson in 1984 (Gerard & Peterson, 1984), the CPLNI has been employed in different contexts in cardiology and is a reference in the field. Used to measure patient-perceived learning needs (Gerard & Peterson, 1984), it comprises 43 items across eight dimensions: *introduction to cardiac care unit* (CCU), *anatomy and physiology*, *psychological factors*, *risk factors*, *medication information*, *diet information*, *physical activity* and *miscellaneous information*. Respondents rate each item on a Likert scale from 1 (not important) to 5 (very important). Cronbach alphas for the overall instrument and its subscales range from .68 to .91 (Gerard & Peterson, 1984). The instrument was translated into French, following the method proposed by Wild et al. (2005). Cronbach alphas obtained for the overall instrument and its sub-scales ranged from .81 to .96.

Developed and validated by Sullivan et al. in 1998 (Sullivan et al., 1998), the CSES serves to measure the confidence individuals have in dealing with the challenges posed by heart disease. It comprises 13 items across two dimensions: *control symptoms* and *maintain functioning* (Sullivan et al., 1998). Respondents rate each item on a Likert scale from 0 (not at all confident) to 4 (completely confident; Sullivan et al., 1998). Cronbach alphas of .90 and .87 were obtained for the dimensions respectively (Sullivan et al., 1998). The instrument was translated into French, following the method proposed by Wild et al. (2005). In this study, Cronbach alphas ranged from .81 to .85 for the dimensions.

3.5 | Ethical consideration

The study complied with the principles outlined in the Declaration of Helsinki (Rickham, 1964) and was approved by the Vaud Ethical Committee (No 2019-01694).

3.6 | Data analysis

Data were entered from hardcopy questionnaires to Excel® spreadsheets and verified twice for accuracy. Then, the database was transferred to Stata/IC version 15.1 (StataCorp).

Data analysis focused on computing descriptive correlational statistics. For quantitative variables, measures of position, shape, dispersion and central tendency were computed. For qualitative variables, absolute and relative frequencies were computed. Because results lacked normal distribution, nonparametric tests were used. To compare values between groups, the Mann–Whitney test was used. To compare more than two, the Kruskall–Wallis test was used. To test correlations between sociodemographic/clinical characteristics, scores and dimensions, the Kendall correlation coefficient. When recommended, Bonferroni correction was used, and significant levels have been adjusted according to the number of tests realised. Missing data were not imputed. Questionnaires with more than 10% responses missing were considered incomplete and omitted from analysis.

4 | RESULTS

4.1 | Sample

One hundred and fifty-seven questionnaires were distributed to eligible patients, but 41 refused to participate—a participation rate of 73.9%. Twenty-three participants were excluded because the returned self-administered questionnaires had more than 10% of missing data. For that reason, 93 had proceeded for further analysis (Figure 2).

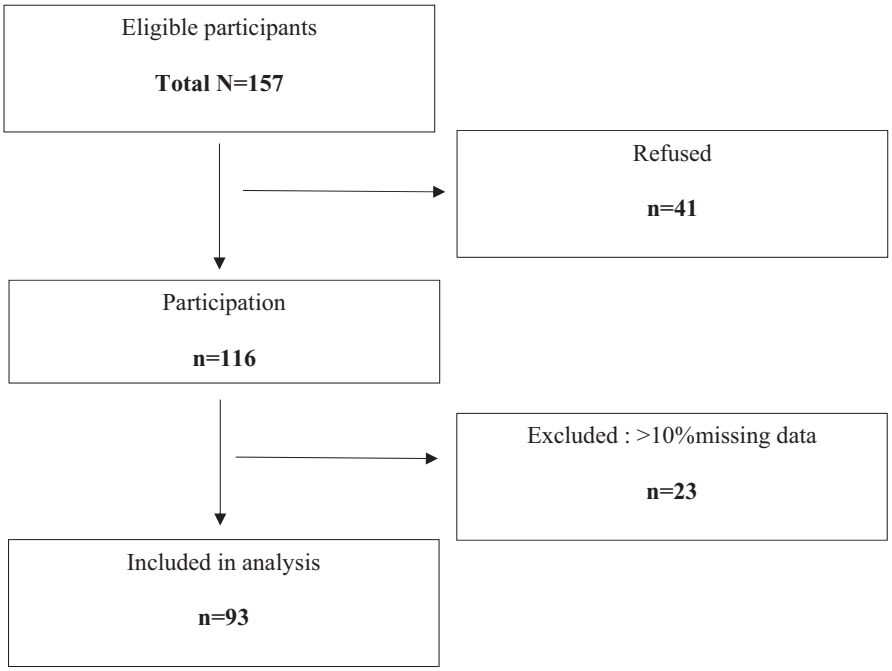

FIGURE 2 Participant recruitment diagram.

4.2 | Sociodemographic profile

Of the 93 cardiology patients who participated in the study, 50 came from the inpatient unit and 43 from the outpatient unit. As shown in Table 1, in both units the majority of the participants were men between 61 and 70 years old, retired, with primary and lower secondary education, and with a spouse as the main support person at home. The majority of participants also indicated practicing some physical activity, not being a smoker, not being on a specific diet and not consuming alcohol.

4.3 | Clinical profile

In the inpatient unit, ACS was present in 96% of patients (Table 2). More specifically, 44% had STEMI, 46% NSTEMI and 6% unstable angina. In the outpatient unit, 70% of patients had ACS. More specifically, 21% had STEMI and 49%, NSTEMI. In both units, STEMI was more prevalent among men than women. Additionally, participants presented with other risk factors such as hypertension; hypercholesterolemia; type 2 diabetes; and obesity. For 72% of the participants in the inpatient unit, it was their first PCI, and for 68% it was their first hospitalisation in a inpatient cardiology unit. In the outpatient unit, only 40% indicated that it was their first PCI and 44% reported that it was their first hospitalisation. The percentage of participants who declared having received TPE previously was lower in the inpatient unit (36% vs. 60%). The most frequent TPE sources in the inpatient unit were: the cardiologist (31%) and the cardiology ward workers (non-specific; 31%). In the outpatient unit, there were: nurses (91%) and the general practitioner (9%).

4.4 | Learning needs

The CPLNI median total score was significantly higher for patients in the inpatient unit than for those in the outpatient unit: 4.23 (3.82, 4.64) versus 3.67 (3.33, 4.09), $p < .001$ (Table 3). No statistically significant inter-unit difference emerged in terms of learning needs and sociodemographic and clinical characteristics.

Table 3 gives the scores by CPLNI dimensions and unit type. The needs patients considered most important regarded *anatomy and physiology*, *risk factors and medication*. The least important needs regarded *introduction to CCU*, *diet information*, *physical activity* and *miscellaneous information*, though they still scored high. In the inpatient unit, participants ascribed the greatest importance to item 6: 'What to do if I have chest pain?' with a median score of 5(4, 5). In the outpatient unit, it was item 10: 'What happens when someone has a heart attack?' with a median score of 5(4, 5). The item that participants in the inpatient unit ascribed the least importance to, was item 3: 'Why I have an intravenous (IV) line?' (med = 4[3, 5]). In the outpatient unit, it was item 37: 'How to take my pulse?' (med = 3[1, 4]).

4.5 | Self-efficacy level

The CSES median total scores were moderate and remained similar in the two units (Table 4). No statistically significant inter-unit difference emerged in terms of self-efficacy and sociodemographic and clinical characteristics.

In both units the dimension that patients expressed the most confidence in was *maintain functioning* (Table 4). The one with the lower median score was *control symptoms*.

TABLE 1 Sociodemographic characteristics.

Sociodemographic characteristics	Inpatients (*N* = 50)		Outpatients (*N* = 43)		Both (*N* = 93)	
	n (%)	Med(P_{25},P_{75})	*n* (%)	Med(P_{25},P_{75})	*n* (%)	Med(P_{25},P_{75})
Gender						
Female	13 (26)		9 (21)		22 (24)	
Male	37 (74)		34 (79)		71 (76)	
Age (years)		64 (57, 71)		69 (58, 74)		67 (58, 73)
31–50	2 (4)		5 (12)		7 (8)	
51–60	17 (34)		8 (19)		25 (27)	
61–70	18 (36)		13 (30)		31 (33)	
71–80	7 (14)		12 (28)		19 (20)	
>80	6 (12)		5 (11)		11 (12)	
Employment status						
Paid activity	21 (42)		13 (30)		34 (37)	
Work disability	1 (2)		2 (5)		3 (3)	
Retired	25 (50)		28 (65)		53 (57)	
Unemployment	3 (6)		0 (0)		3 (3)	
Academic achievement level						
Primary	14 (28)		6 (14)		20 (22)	
Professional Apprenticeship	19 (38)		20 (47)		39 (42)	
Secondary	4 (8)		2 (4)		6 (6)	
Higher education	13 (26)		15 (35)		28 (30)	
Main support person						
Yes	39 (78)		27 (63)		66 (71)	
Spouse	33 (66)		24 (56)		57 (61)	
Child	7 (14)		3 (7)		10 (11)	
Friend	4 (8)		1 (2)		5 (5)	
Protected apartment	1 (2)		0 (0)		1 (1)	
Housekeeper	1 (2)		0 (0)		1 (1)	
Parents	1 (2)		0 (0)		1 (1)	
No	11 (22)		16 (37)		27 (29)	
Current smoker						
Yes	14 (28)		6 (14)		20 (22)	
Since (years)		39 (25, 40)		44 (42, 65)		40 (27.5, 45.5)
No. of cigarettes/day		17 (15, 20)		8 (6, 20)		15 (8, 20)
No	36 (72)		37 (86)		73 (78)	
Former smoker						
Yes	18 (36)		18 (42)		36 (39)	
Since (years)		27.5 (18, 45)		14.5 (8, 30)		19.5 (10, 30)
No	32 (64)		25 (58)		57 (61)	
Physical activity						
Yes	25 (50)		31 (72)		56 (60)	
Time per week(h)		4.5 (2, 6)		4 (3, 7)		4 (3, 6)
No	25 (50)		12 (28)		37 (40)	
Special diet						
Yes	14 (28)		26 (60)		40 (43)	

TABLE 1 (Continued)

Sociodemographic characteristics	Inpatients (N = 50)		Outpatients (N = 43)		Both (N = 93)	
	n (%)	Med(P_{25},P_{75})	n (%)	Med(P_{25},P_{75})	n (%)	Med(P_{25},P_{75})
Low fat	11 (22)		21 (49)		32 (34)	
Sugar free	8 (16)		8 (19)		16 (17)	
No salt	5 (10)		7 (16)		12 (13)	
No	36 (72)		17 (40)		53 (57)	
Alcohol consumption						
Yes	15 (30)		19 (44)		34 (37)	
Number of drinks/day		2 (1, 3)		2 (1, 2)		2 (1, 2)
No	35 (70)		24 (56)		59 (63)	

TABLE 2 Clinical profile.

Clinical data	Inpatients (N = 50) n (%)	Outpatients (N = 43) n (%)	Both (N = 93) n (%)
Reason for hospitalisation			
STEMI	22 (44)	9 (21)	31 (33)
NSTEMI	23 (46)	21 (49)	44 (47)
Unstable angina	3 (6)	0 (0)	3 (3)
Stable angina	2 (4)	13 (30)	15 (16)
Medical history			
Hypertension	27 (54)	23 (53)	50 (54)
Type 2 diabetes	11 (22)	4 (9)	15 (16)
Obesity	8 (17)	4 (9)	12 (13)
Hypercholesterolemia	14 (28)	21 (49)	35 (38)
Number of hospitalizations in cardiology			
1	34 (68)	19 (44)	53 (57)
2 or more	16 (32)	24 (56)	40 (43)
No. of PCI			
1	36 (72)	17 (40)	53 (57)
2 or more	14 (29)	26 (60)	40 (43)
TPE prior to PCI			
Yes	18 (36)	26 (60)	44 (47)
No	31 (62)	17 (40)	48 (52)
TPE sources			
Nurse	2 (4)	10 (23)	12 (13)
Family physician	4 (8)	1 (2)	5 (6)
Cardiologist	5 (10)	0 (0)	5 (6)
Cardiology unit	5 (10)	0 (0)	5 (6)

In the inpatient unit, the highest rating went to item 10: 'How confident are you that you can maintain your usual activities at home with your family?' (med = 3[3, 4]). In the outpatient unit, it went to item 7: 'How confident are you that you know how to take your cardiac medications?' (med = 3[3, 4]). The lowest rating in the inpatient unit went to item 1: 'How confident are you that you can control your chest pain by changing your activity levels?' (med = 2[2, 3]). In the outpatient unit, it went to item 4: 'How confident are you that you can control your breathlessness by taking your medications?' (med = 2[2, 3]).

4.6 | Exploratory correlations

As shown in Table 5, regardless of the affiliating cardiac care unit, receiving a TPE prior to PCI did not influence the mean total CPLNI and CSES score. This study had not presented any statistically significant association or correlation.

5 | DISCUSSION

Our study aimed to describe the learning needs and self-efficacy level of CAD patients who underwent PCI. It also sought to examine the association between their learning needs, self-efficacy level, and sociodemographic and clinical characteristics. This had never before been investigated in Switzerland.

Our results show that learning needs were considerable and self-efficacy level was moderate. We also noted that learning needs did not diminish when TPE had been received previously. The results obtained and the characteristics of our study sample were, on the whole, similar to those found in the literature (Eshah, 2011; Fors et al., 2016; Greco et al., 2016; Kang & Yang, 2013; Mosleh et al., 2016, 2017; Vibulchai et al., 2016; Weibel et al., 2014; Zhang et al., 2018).

Regarding learning needs, the high score on the CPLNI indicated that participants had important learning needs that required addressing. Because articles published on the subject used multiple data collection instruments, direct comparisons are more difficult to make. However, this score did prove high as well (Eshah, 2011; Huriani, 2019; Kilonzo & O'Connell, 2011; Mosleh et al., 2016, 2017). Tangible and prominent issues like ACS and PCI may induce more stress among patients and therefore increase their level of concern about their health (Knowles et al., 2015). Furthermore, according to Eshah (2011), after an acute event, patients often feel they are getting a second chance. This may explain why they want to

TABLE 3 CPLNI score by dimension and cardiac care unit.

CPLNI dimensions	Inpatients ($n = 50$) med(P_{25},P_{75})	Outpatients ($n = 43$) med(P_{25},P_{75})	*p*
Total score	4.23 (3.82, 4.64)	3.67 (3.33, 4.09)	<.001*
Dimension 1: « Introduction to cardiac care unit »	4.17 (3.67, 4.67)	3.5 (2.83, 4)	
Dimension 2: « Anatomy et physiology »	4.67 (4.17, 5)	4.33 (3.5, 4.67)	
Dimension 3: « Psychological factors»	4.4 (4, 4.8)	3.8 (3.4, 4.2)	
Dimension 4: « Risk factors »	4.5 (4, 5)	4.25 (3.5, 4.75)	
Dimension 5: « Medication information »	4.25 (4, 5)	3.75 (3, 4.5)	
Dimension 6: «Diet information»	4.17 (3.33, 4.5)	3.67 (3, 4.17)	
Dimension 7: « Physical activity»	3.8 (3.2, 4.6)	3.6 (2.8, 4.2)	
Dimension 8: « Miscellaneous information »	4.29 (3.71, 4.71)	3.43 (2.43, 3.86)	

*p-Value < .008.

TABLE 4 CSES score by dimension and cardiac care unit.

CSES dimensions	Inpatients ($n = 50$) med(P_{25},P_{75})	Outpatients ($n = 43$) med(P_{25},P_{75})	*p*
Total score	2.73 (2.25, 3.08)	2.64 (2.45, 3.09)	.950
Dimension 1 « Control symptoms »	2.67 (2.25, 3.13)	2.63 (2.38, 3)	
Dimension 2 « Maintain functioning »	2.8 (2.4, 3)	3 (2.4, 3.33)	

TABLE 5 CPLNI and CSES total scores comparison accordingly TPE reception before PCI (Wilcoxon–Mann–Whitney test with Bonferroni correction).

	Inpatients ($n = 50$)			Outpatients ($n = 43$)		
	TPE before PCI			TPE before PCI		
	Yes, *Med*(P_{25},P_{75})	No, *Med*(P_{25},P_{75})	*p*	Yes, *Med*(P_{25},P_{75})	No, *Med*(P_{25},P_{75})	*p*
CPLNI Total score	3.98 (3.81, 4.26)	4.40 (3.91, 4.74)	.035	3.43 (3.33, 4.02)	3.81 (3.67, 3.91)	.051
CSES Total score	2.88 (2.38, 3.08)	2.69 (2.23, 3.23)	.633	2.62 (2.45, 3)	2.81 (2.31, 3.18)	.601

*p-Value < .008.

learn more in order to purse a healthy lifestyle and avoid recurrences (Eshah, 2011).

As for which learning needs have higher priority, in our study the most important dimensions for both inpatients and outpatients were *anatomy and physiology*, followed by *risk factors* and *medication information*. It may be that patients want to understand what really happened with their heart and, for this reason, wish to acquire more information on how the heart functions and how CVD develops and impacts cardiac blood flow. According to Kilonzo and O'Connell (2011), patients seek information regarding the immediate challenges they face in order to better understand the phenomena. As for *risk factors*, due to the severity of the event experienced, patients may want to know more about them in order to better control them, understand why they suffered from an ACS and prevent recurrences (Mosleh et al., 2016). Finally, the importance ascribed to *medication* may be due to the fact that, when ACS occurs, patients witness the introduction of new medication, which reinforces their sense of importance (Mosleh et al., 2017). New medications often require a close follow-up to avoid adverse effects and to ensure a therapeutic level. In addition, patients might be more reliant on medication to control their health condition than to initiate healthy behaviours (Mosleh et al., 2017).

Despite its high score, *physical activity* was the least important dimension among participants in the inpatient unit. This result diverged only with the study of Kilonzo and O'Connell (2011), which reported *physical activity* as one of the most important dimensions. A possible reason for this result is the perceived notion among patients that rest is fundamental in the initial stages following this event. According to Mosleh et al. (2017), this also could reflect knowledge gaps regarding the relationship between physical activity and cardiovascular disease and the importance of physical activity in cardiac rehabilitation. In the outpatient unit, *miscellaneous information* was the least important dimension. Perhaps the fact that their PCI was elective, allowed them to obtain general information during consultations prior to the intervention.

As already mentioned, it is possible to demonstrate an association between the level of learning needs and cardiology unit types.

Patients in the inpatient unit present higher levels than do those in the outpatient unit. One reason for this difference may have to do with the number of PCI undergone previously. For 72% of patients in the inpatient unit, it was their first intervention, whereas this was the case for only 40% of those in the outpatient unit. This is in line with previous research (Huriani, 2019). Patients are likely to have received TPE during previous ACS diagnosis which contributes to reduced perception of learning needs in current events. Another possible explanation is that only patients in the inpatient unit can arrive at the hospital in an emergency situation via the STEMI fast track. The emergency, of course, precludes any type of previous TPE. This stands in contrast with outpatients, who are more likely to receive TPE beforehand or to read certain sources of information and, consequently, reduce their learning needs (Huriani, 2019).

Results regarding self-efficacy level suggest that patients have a moderate level of confidence in their abilities. The same was observed in the study of Kang and Yang (2013). Because of differences in the instruments used and how scores were calculated, it was not possible to make any other direct comparison of the self-efficacy level obtained in our study with that reported in other studies (Brink et al., 2012; Fors et al., 2016; Kang & Yang, 2013; Slovinec D'Angelo et al., 2014; Vibulchai et al., 2016; Weibel et al., 2014; Zhang et al., 2018). However, this score supports the idea that patients have resources that can be mobilised and, especially, strengthened through tailored TPE.

In contrast to Eshah's study (2011), TPE did not have any statistically significant influence over patient learning needs and self-efficacy levels. One reason might be that the TPE provided were not specifically tailored to meet the learning needs of patients. To achieve effective patient education, TPE must be specific to each individual (Knowles et al., 2015). Another possible reason and concomitant with other studies (Kilonzo & O'Connell, 2011; Mosleh et al., 2017), could be associated with nurses' perceived learning needs diverged from patients' actual learning needs, leadings to poor outcomes. Finally, another possible explanation for the lack of influence on the self-efficacy level might be related to the fact that TPE provided might not take into account patient self-efficacy and personal resources in order to strengthen them and reinforce self-management of the disease.

Our overall results could be due to: (1) patient level of health literacy (Chesser et al., 2016; Ghisi et al., 2018; González-Chica et al., 2016; Rowlands et al., 2013); (2) sub-optimal use of the scope of nursing practice (SNP) Lavander et al., 2016); and (3) advances in medicine and health policy that have an impact on the length of hospital stays (de Belder et al., 2014; Observatoire Suisse de la Santé, 2016).

According to Nutbeam et al. (2018), health literacy refers to the skills set that allows a person to access, understand and use information to promote and maintain good health. It may be influenced by sociodemographic characteristics (Chesser et al., 2016; Ghisi et al., 2018; González-Chica et al., 2016; Kilonzo et al., 2011; Rowlands et al., 2013). Our study sample comprised a median age of 61–70 years, retired and with a primary or lower secondary education. Such a profile is often associated with lower levels of health literacy, which could generate a higher level of learning needs (Chesser et al., 2016; Ghisi et al., 2018; González-Chica et al., 2016; Rowlands et al., 2013). Lower literacy levels may also be associated with lower self-efficacy levels (Xu et al., 2018). In our study, the fact that the self-efficacy level was moderate tends to reinforce the perception that patient health literacy was probably modest.

Another possible reason for obtaining these results has to do with how the SNP is used. This refers to the range of functions and legal responsibilities acquired by way of advanced training and education (Déry et al., 2017). It comprises role-specific activities such as patient assessment, planning and implementation of care, communication, coordination and TPE (Déry et al., 2017). Because of the nature of their work, their proximity with patients and their competencies, nurses and clinical nurse specialists (CNS) can play a key role in TPE (Déry et al., 2017; Lu et al., 2019; Mosleh et al., 2017; O'Brien et al., 2013; Timmins, 2005b). However, studies show that the SNP continues to be used suboptimal (Lavander et al., 2016). The reasons for this may regard historical aspects of the profession, the fact that care is organised primarily on the basis of programmed tasks performed at a set time and the low priority given to TPE in daily practice (Déry et al., 2017; Nadot, 2012). Indeed, priority is often given to delegated medical acts at the expense of relational care and TPE (Ausserhofer et al., 2014). The activities given top priority are those that can impact the physical health of patients immediately (Ausserhofer et al., 2014). About 41% of TPE activities are not carried out (Ausserhofer et al., 2014). The high nurse-to-patient ratios which means that the time allocated to each patient is reduced and the organisational context in institutions may be the reasons for this prioritisation (Ausserhofer et al., 2014). Furthermore, about 15% of a nurse's workday continues to be taken up by tasks with no added value, such as cleaning of equipment, distributing and retrieving food trays and answering the telephone (Antinaho et al., 2015; Ausserhofer et al., 2014). The suboptimal use of the SNP can bring about a deterioration of care quality and patient satisfaction, an increase in patient morbidity/mortality and adverse events (Jones et al., 2015).

The evolution of medicine, health policies and the financial pressure of keeping health costs under control may be other reasons for the results we obtained. The introduction of PCI to treat certain types of ACS has improved care quality and shortened hospital stays (de Belder et al., 2014). Moreover, because of the economic pressures on the health system, the tendency is for inpatient hospital care to be reduced to a minimum (Observatoire Suisse de la Santé, 2016). Consequently, the opportunity for education is constantly shrinking. The problem is all the more significant for NSTEMI patients, as they are often not included in post-hospitalisation rehabilitation programs, which means that the opportunity for them is further diminished. These factors increase their risk of recurrence, morbidity and mortality (Eshah, 2011; Eshah et al., 2010; Mosleh et al., 2016, 2017).

5.1 | Limitations

One limitation of the study is the fact that the sample was of modest size and rather homogenous, and that the study was conducted

at a single site which limits the generalizability of the results. These aspects are probably the reason we observed no statistically significant inter-unit differences in terms of learning needs, self-efficacy level and sociodemographic and clinical characteristics.

Second, despite their high Cronbach alphas, the instruments used were not validated in a Swiss population. Third, our study did not take account of the level of health literacy of patients, their cultural attributes and their influence on learning needs and self-efficacy level. Finally, the experience and needs of patients, could have been explored qualitatively via interviews or focus groups. Investigating these aspects would help deepen our knowledge of this population.

6 | CONCLUSION

Overall, our results show that this population has high but individual needs and a moderate self-efficacy level. This is why it would be interesting to co-develop a tailored educational program that is consumer led. The Cardiac Patient Education Framework provides useful guidelines for this purpose.

The chronic nature of CAD, the risk of recurrence, and today's shortened hospital stays speak to the importance of rapid and targeted intervention in order to provide this patient population with secondary prevention support. Because of their field of competence and their close contact with patients, nurses can play a major role in TPE.

7 | RELEVANCE TO CLINICAL PRACTICE

Patient therapeutic adherence contributes to prevent recurrent ischemic cardiovascular events after PCI. To promote therapeutic adherence, healthcare professionals should evaluate individual learning needs and self-efficacy levels during the development of a tailored TPE in order to meet those needs and promote patient resources. As shown in this study, patient's learning needs are high and individual, and their self-efficacy level is moderate.

AUTHOR CONTRIBUTIONS

Study design: RS, NP, AZ and COB; data collection: RS and NP; all the authors contributed to data analysis and interpretation, statistical analysis, study supervision and writing the manuscript.

ACKNOWLEDGEMENTS

The authors would like to thank the nurses of both cardiology units for participating in the study and for their warm reception. Open access funding provided by Haute Ecole Specialisee de la Suisse Occidentale.

FUNDING INFORMATION

This research received no external funding.

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Ricardo Salgado https://orcid.org/0000-0002-8287-7361
Claudia Ortoleva Bucher https://orcid.org/0000-0002-8411-4181

REFERENCES

Aazami, S., Jaafarpour, M., & Mozafari, M. (2016). Exploring expectations and needs of patients undergoing angioplasty. *Journal of Vascular Nursing*, *34*(3), 93–99. https://doi.org/10.1016/j.jvn.2016.04.003

ACC. (2018). *Heart disease and stroke statistics—2018 update*. American College of Cardiology. http%3a%2f%2fwww.acc.org%2flatest-in-cardiology%2ften-points-to-remember%2f2018%2f02%2f09%2f11%2f59%2fheart-disease-and-stroke-statistics-2018-update

AHA. (2022). *What is cardiac rehabilitation?* Www.Heart.Org. https://www.heart.org/en/health-topics/cardiac-rehab/what-is-cardiac-rehabilitation

Antinaho, T., Kivinen, T., Turunen, H., & Partanen, P. (2015). Nurses' working time use—How value adding it is? *Journal of Nursing Management*, *23*(8), 1094–1105. https://doi.org/10.1111/jonm.12258

Arnett, D. K., Blumenthal, R. S., Albert, M. A., Buroker, A. B., Goldberger, Z. D., Hahn, E. J., Himmelfarb, C. D., Khera, A., Lloyd-Jones, D., McEvoy, J. W., Michos, E. D., Miedema, M. D., Muñoz, D., Smith, S. C., Virani, S. S., Williams, K. A., Yeboah, J., & Ziaeian, B. (2019). 2019 ACC/AHA guideline on the primary prevention of cardiovascular disease. *Journal of the American College of Cardiology*, *70*, e177–e232. https://doi.org/10.1016/j.jacc.2019.03.010

Ausserhofer, D., Zander, B., Busse, R., Schubert, M., Geest, S. D., Rafferty, A. M., Ball, J., Scott, A., Kinnunen, J., Heinen, M., Sjetne, I. S., Moreno-Casbas, T., Kózka, M., Lindqvist, R., Diomidous, M., Bruyneel, L., Sermeus, W., Aiken, L. H., Schwendimann, R., & Consortium, on behalf of the R. (2014). Prevalence, patterns and predictors of nursing care left undone in European hospitals: Results from the multicountry cross-sectional RN4CAST study. *BMJ Quality and Safety*, *23*(2), 126–135. https://doi.org/10.1136/bmjqs-2013-002318

Benjamin, E. J., Blaha, M. J., Chiuve, S. E., Cushman, M., Das, S. R., Deo, R., de Ferranti, S. D., Floyd, J., Fornage, M., Gillespie, C., Isasi, C. R., Jiménez, M. C., Jordan, L. C., Judd, S. E., Lackland, D., Lichtman, J. H., Lisabeth, L., Liu, S., Longenecker, C. T., … Muntner, P. (2017). Heart disease and stroke statistics—2017 update: A report from the American Heart Association. *Circulation*, *135*(10), e146–e603. https://doi.org/10.1161/CIR.0000000000000485

Brink, E., Alsén, P., Herlitz, J., Kjellgren, K., & Cliffordson, C. (2012). General self-efficacy and health-related quality of life after myocardial infarction. *Psychology, Health & Medicine*, *17*(3), 346–355. https://doi.org/10.1080/13548506.2011.608807

Carballo, D., Rodondi, N., Auer, R., Carballo, S., Nanchen, D., Räber, L., Klingenberg, R., Keller, P.-F., Heg, D., Jüni, P., Muller, O., Matter, C. M., Lüscher, T. F., Windecker, S., Mach, F., & Gencer, B. (2019). Clinical impact of a structured secondary cardiovascular prevention program following acute coronary syndromes: A prospective multicenter healthcare intervention. *PLoS One*, *14*(2), e0211464. https://doi.org/10.1371/journal.pone.0211464

Cheng, K., Ingram, N., Keenan, J., & Choudhury, R. P. (2015). Evidence of poor adherence to secondary prevention after acute coronary syndromes: Possible remedies through the application of new technologies. *Open Heart*, *2*(1), e000166. https://doi.org/10.1136/openhrt-2014-000166

Chesser, A. K., Keene Woods, N., Smothers, K., & Rogers, N. (2016). Health literacy and older adults. *Gerontology and Geriatric Medicine*, *2*, 233372141663049. https://doi.org/10.1177/2333721416630492

Clark, A. M., King-Shier, K. M., Thompson, D. R., Spaling, M. A., Duncan, A. S., Stone, J. A., Jaglal, S. B., & Angus, J. E. (2012). A qualitative systematic review of influences on attendance at cardiac rehabilitation programs after referral. *American Heart Journal*, *164*(6), 835–845.e2. https://doi.org/10.1016/j.ahj.2012.08.020

de Belder, M. A., Ludman, P. F., McLenachan, J. M., Weston, C. F. M., Cunningham, D., Lazaridis, E. N., & Gray, H. H. (2014). The National Infarct Angioplasty Project: UK experience and subsequent developments. *EuroIntervention*, *10*(T), T96–T104. https://doi.org/10.4244/EIJV10STA15

Déry, J., D'amour, D., & Roy, C. (2017). L'étendue optimale de la pratique infirmière. *Perspective infirmière: Revue Officielle de l'Ordre Des infirmières et Infirmiers du Québec*, *14*, 51–55. https://www.oiiq.org/sites/default/files/uploads/periodiques/Perspective/vol14no01/11-recherche.pdf

ESC. (2022). *ESC prevention of CVD Programme*. https://www.escardio.org/Education/ESC-Prevention-of-CVD-Programme

Eshah, N. F. (2011). Jordanian acute coronary syndrome patients' learning needs: Implications for cardiac rehabilitation and secondary prevention programs. *Nursing & Health Sciences*, *13*(3), 238–245. https://doi.org/10.1111/j.1442-2018.2011.00608.x

Eshah, N. F., Bond, A. E., & Froelicher, E. S. (2010). The effects of a cardiovascular disease prevention program on knowledge and adoption of a heart healthy lifestyle in Jordanian working adults. *European Journal of Cardiovascular Nursing*, *9*(4), 244–253. https://doi.org/10.1016/j.ejcnurse.2010.02.002

Fors, A., Taft, C., Ulin, K., & Ekman, I. (2016). Person-centred care improves self-efficacy to control symptoms after acute coronary syndrome: A randomized controlled trial. *European Journal of Cardiovascular Nursing*, *15*(2), 186–194. https://doi.org/10.1177/1474515115623437

Gerard, P. S., & Peterson, L. M. (1984). Learning needs of cardiac patients. *Cardio-Vascular Nursing*, *20*(2), 7–11. https://www.ncbi.nlm.nih.gov/pubmed/6570812

Ghisi, G. L. d. M., Chaves, G. S. d. S., Britto, R. R., & Oh, P. (2018). Health literacy and coronary artery disease: A systematic review. *Patient Education and Counseling*, *101*(2), 177–184. https://doi.org/10.1016/j.pec.2017.09.002

Gomes, L., Liébana-Presa, C., Araújo, B., Marques, F., & Fernández-Martínez, E. (2021). Heart disease, now what? Improving quality of life through education. *International Journal of Environmental Research and Public Health*, *18*(6), 3077. https://doi.org/10.3390/ijerph18063077

González-Chica, D. A., Mnisi, Z., Avery, J., Duszynski, K., Doust, J., Tideman, P., Murphy, A., Burgess, J., Beilby, J., & Stocks, N. (2016). Effect of health literacy on quality of life amongst patients with Ischaemic heart disease in Australian general practice. *PLoS One*, *11*(3), e0151079. https://doi.org/10.1371/journal.pone.0151079

Greco, A., Cappelletti, E. R., Monzani, D., Pancani, L., D'Addario, M., Magrin, M. E., Miglioretti, M., Sarini, M., Scrignaro, M., Vecchio, L., Fattirolli, F., & Steca, P. (2016). A longitudinal study on the information needs and preferences of patients after an acute coronary syndrome. *BMC Family Practice*, *17*, 136. https://doi.org/10.1186/s12875-016-0534-8

HUG. (2021). *ELIPS pour combattre l'infarctus et l'athérosclérose*. https://www.hug.ch/elips

Huriani, E. (2019). Myocardial infarction patients' learning needs: Perceptions of patients, family members and nurses. *International Journal of Nursing Sciences*, *6*(3), 294–299. https://doi.org/10.1016/j.ijnss.2019.05.001

Huynh, T., Montigny, M., Iftikhar, U., Gagnon, R., Eisenberg, M., Lauzon, C., Mansour, S., Rinfret, S., Afilalo, M., Nguyen, M., Kouz, S., Déry, J.-P., Harvey, R., De LaRocheliere, R., Cantin, B., Schampaert, E., & Tardif, J.-C. (2018). Recurrent cardiovascular events in survivors of myocardial infarction with ST-segment elevation (from the AMI-QUEBEC study). *The American Journal of Cardiology*, *121*(8), 897–902. https://doi.org/10.1016/j.amjcard.2017.12.037

Jones, T. L., Hamilton, P., & Murry, N. (2015). Unfinished nursing care, missed care, and implicitly rationed care: State of the science review. *International Journal of Nursing Studies*, *52*(6), 1121–1137. https://doi.org/10.1016/j.ijnurstu.2015.02.012

Kang, Y., & Yang, I.-S. (2013). Cardiac self-efficacy and its predictors in patients with coronary artery diseases. *Journal of Clinical Nursing*, *22*(17–18), 2465–2473. https://doi.org/10.1111/jocn.12142

Kilonzo, B., Hughes, M., & O'Connell, R. (2011). Health literacy and coronary heart disease: Implications for nurses. *British Journal of Cardiac Nursing*, *16*, 29–34. https://doi.org/10.12968/bjca.2011.6.1.29

Kilonzo, B., & O'Connell, R. (2011). Secondary prevention and learning needs post percutaneous coronary intervention (PCI): Perspectives of both patients and nurses. *Journal of Clinical Nursing*, *20*(7–8), 1160–1167. https://doi.org/10.1111/j.1365-2702.2010.03601.x

Knowles, M. S., Holton, E. F., & Swanson, R. A. (2015). *The adult learner: The definitive classic in adult education and human resource development* (8th ed.). Routledge.

Lavander, P., Meriläinen, M., & Turkki, L. (2016). Working time use and division of labour among nurses and health-care workers in hospitals—A systematic review. *Journal of Nursing Management*, *24*(8), 1027–1040. https://doi.org/10.1111/jonm.12423

Lu, M., Ma, J., Lin, Y., Zhang, X., Shen, Y., & Xia, H. (2019). Relationship between patient's health literacy and adherence to coronary heart disease secondary prevention measures. *Journal of Clinical Nursing*, *28*(15–16), 2833–2843. https://doi.org/10.1111/jocn.14865

Mayberry, L. S., Schildcrout, J. S., Wallston, K. A., Goggins, K., Mixon, A. S., Rothman, R. L., Kripalani, S., & Vanderbilt Inpatient Cohort Study. (2018). Health literacy and 1-year mortality: Mechanisms of association in adults hospitalized for cardiovascular disease. *Mayo Clinic Proceedings*, *93*(12), 1728–1738. https://doi.org/10.1016/j.mayocp.2018.07.024

McClellan, M., Brown, N., Califf, R. M., & Warner, J. J. (2019). Call to action: Urgent challenges in cardiovascular disease: A presidential advisory from the American Heart Association. *Circulation*, *139*(9), e44–e54. https://doi.org/10.1161/CIR.0000000000000652

Mosleh, S. M., Eshah, N. F., & Almalik, M. M. (2017). Perceived learning needs according to patients who have undergone major coronary interventions and their nurses. *Journal of Clinical Nursing*, *26*(3–4), 418–426. https://doi.org/10.1111/jocn.13417

Mosleh, S. M., Eshah, N. F., & Darawad, M. (2016). Percutaneous coronary intervention and heart surgery learning needs of patients in Jordan. *International Nursing Review*, *63*(4), 562–571. https://doi.org/10.1111/inr.12318

Nadot, M. (2012). Recherche fondamentale en science infirmière. *Recherche en Soins Infirmiers*, *109*(2), 57–68. https://www.cairn.info/revue-recherche-en-soins-infirmiers-2012-2-page-57.htm

Nutbeam, D., McGill, B., & Premkumar, P. (2018). Improving health literacy in community populations: A review of progress. *Health Promotion International*, *33*(5), 901–911. https://doi.org/10.1093/heapro/dax015

O'Brien, F., O'Donnell, S., McKee, G., Mooney, M., & Moser, D. (2013). Knowledge, attitudes, and beliefs about acute coronary syndrome in patients diagnosed with ACS: An Irish cross-sectional study. *European Journal of Cardiovascular Nursing*, *12*(2), 201–208. https://doi.org/10.1177/1474515112446544

Observatoire Suisse de la Santé. (2016). *Recours aux soins hospitaliers stationnaires* (N° 10/2016). https://www.obsan.admin.ch/sites/default/files/publications/2016/obsan_bulletin_2016-10_f.pdf

O'Neil, A., Berk, M., Davis, J., & Stafford, L. (2013). Cardiac-self efficacy predicts adverse outcomes in coronary artery disease (CAD) patients. *Health*, *05*(07), 6–14. https://doi.org/10.4236/health.2013.57A3002

Pavy, B., Barbet, R., Carré, F., Champion, C., Iliou, M.-C., Jourdain, P., Juillière, Y., Monpère, C., Brion, R., & Working Group of Exercise Rehabilitation and Sport, & Therapeutic Education Commission of the French Society of Cardiology. (2013). Therapeutic education in coronary heart disease: Position paper from the working Group of Exercise Rehabilitation and Sport (GERS) and the therapeutic education Commission of the French Society of cardiology. *Archives of Cardiovascular Diseases*, *106*(12), 680–689. https://doi.org/10.1016/j.acvd.2013.10.002

Ravn, M. B., Uhd, M., Svendsen, M. L., Ørtenblad, L., & Maribo, T. (2022). Why do patients with ischaemic heart disease drop out from cardiac rehabilitation in primary health settings. A qualitative audit of patient charts. *Frontiers in Rehabilitation Sciences*, *3*, 1–7. https://www.frontiersin.org/articles/10.3389/fresc.2022.837174

Rickham, P. P. (1964). Human experimentation. Code of ethics of the world medical association. Declaration of Helsinki. *British Medical Journal*, *2*(5402), 177. https://doi.org/10.1136/bmj.2.5402.177

Rodrigo, S. F., Van Exel, H. J., Van Keulen, N., Van Winden, L., Beeres, S. L. M. A., & Schalij, M. J. (2021). Referral and participation in cardiac rehabilitation of patients following acute coronary syndrome; lessons learned. *IJC Heart & Vasculature*, *36*, 100858. https://doi.org/10.1016/j.ijcha.2021.100858

Rodriguez, F., Cannon, C. P., Steg, P. G., Kumbhani, D. J., Goto, S., Smith, S. C., Eagle, K. A., Ohman, E. M., Umez-Eronini, A. A., Hoffman, E., Bhatt, D. L., & REACH Registry Investigators. (2013). Predictors of long-term adherence to evidence-based cardiovascular disease medications in outpatients with stable atherothrombotic disease: Findings from the REACH Registry. *Clinical Cardiology*, *36*(12), 721–727. https://doi.org/10.1002/clc.22217

Rowlands, G. P., Mehay, A., Hampshire, S., Phillips, R., Williams, P., Mann, A., Steptoe, A., Walters, P., & Tylee, A. T. (2013). Characteristics of people with low health literacy on coronary heart disease GP registers in South London: A cross-sectional study. *BMJ Open*, *3*(1), e001503. https://doi.org/10.1136/bmjopen-2012-001503

Slovinec D'Angelo, M. E., Pelletier, L. G., Reid, R. D., & Huta, V. (2014). The roles of self-efficacy and motivation in the prediction of short- and long-term adherence to exercise among patients with coronary heart disease. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association*, *33*(11), 1344–1353. https://doi.org/10.1037/hea0000094

Sullivan, M. D., LaCroix, A. Z., Russo, J., & Katon, W. J. (1998). Self-efficacy and self-reported functional status in coronary heart disease: A six-month prospective study. *Psychosomatic Medicine*, *60*(4), 473–478. https://doi.org/10.1097/00006842-199807000-00014

Timmins, F. (2005a). *Contemporary issues in coronary care nursing* (1re éd.). Routledge.

Timmins, F. (2005b). A review of the information needs of patients with acute coronary syndromes. *Nursing in Critical Care*, *10*(4), 174–183. https://doi.org/10.1111/j.1362-1017.2005.00125.x

Vibulchai, N., Thanasilp, S., & Preechawong, S. (2016). Randomized controlled trial of a self-efficacy enhancement program for the cardiac rehabilitation of Thai patients with myocardial infarction. *Nursing & Health Sciences*, *18*(2), 188–195. https://doi.org/10.1111/nhs.12243

Weibel, L., Massarotto, P., Hediger, H., & Mahrer-Imhof, R. (2014). Early education and counselling of patients with acute coronary syndrome. A pilot study for a randomized controlled trial. *European Journal of Cardiovascular Nursing*, *15*(4), 213–222. https://doi.org/10.1177/1474515114556713

WHO. (1998). *Therapeutic patient education: Continuing education programmes for health care providers in the field of prevention of chronic diseases: Report of a WHO working group*. https://www.euro.who.int/__data/assets/pdf_file/0007/145294/E63674.pdf

WHO. (2017). *Cardiovascular diseases (CVDs)*. Cardiovascular Diseases (CVDs). https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)

Wild, D., Grove, A., Martin, M., Eremenco, S., McElroy, S., Verjee-Lorenz, A., & Erikson, P. (2005). Principles of good practice for the translation and cultural adaptation process for patient-reported outcomes (PRO) measures: Report of the ISPOR task force for translation and cultural adaptation. *Value in Health*, *8*(2), 94–104. https://doi.org/10.1111/j.1524-4733.2005.04054.x

Xu, X. Y., Leung, A. Y. M., & Chau, P. H. (2018). Health literacy, self-efficacy, and associated factors among patients with diabetes. *HLRP: Health Literacy Research and Practice*, *2*(2), e67–e77. https://doi.org/10.3928/24748307-20180313-01

Zhang, P., Xing, F.-M., Li, C.-Z., Wang, F.-L., & Zhang, X.-L. (2018). Effects of a nurse-led transitional care programme on readmission, self-efficacy to implement health-promoting behaviours, functional status and life quality among Chinese patients with coronary artery disease: A randomised controlled trial. *Journal of Clinical Nursing*, *27*(5–6), 969–979. https://doi.org/10.1111/jocn.14064

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Salgado, R., Paulo, N., Zufferey, A., & Bucher, C. O. (2023). Patient's learning needs and self-efficacy level after percutaneous coronary intervention: A descriptive study. *Journal of Clinical Nursing*, *32*, 6415–6426. https://doi.org/10.1111/jocn.16656