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Improving Cardiovascular Outcomes in the Psoriasis Cohort. Psoriasis and Cardiovascular Disease—Clinician Knowledge, Practice and Perceptions

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ABSTRACT

Background: Psoriasis is a risk factor for cardiovascular disease (CVD). This risk is independent and incremental to traditional cardiovascular (CV) risk factors, but clinician and patient perspectives on this risk are unclear. This study aims to assess the knowledge, perceptions, and practice of clinicians and patients with respect to psoriasis and CVD.

Methods: This cross-sectional study consisted of a self-administered questionnaire capturing demographic characteristics, knowledge of the association between psoriasis and CVD, and perspectives on CV screening and management. This was distributed to members of relevant Australasian Speciality Medical Colleges, speciality societies, and psoriasis patients in public and private clinic settings. Survey data were assessed using descriptive statistics. Logistic regression was used to investigate the relationship between categorical variables and the outcome variable, for example, to determine factors predictive of clinician knowledge and perceptions. For all analyses, a p-value of less than 0.05 was considered statistically significant.

Results: A total of 298 clinicians (dermatologists (86), rheumatologists (56), cardiologists (53), general practitioners (103)) and 102 patients with psoriasis were surveyed. Regarding clinician knowledge of the association between psoriasis and CVD, dermatologists and rheumatologists indicated knowledge of this association (98.8%) (85/86) and 91.1% (51/56) respectively, while only 54.7% (29/53) of cardiologists and 29.1% (30/103) of GPs indicated knowledge of this association. Only 23.5% (24/102) of patients surveyed indicated knowledge of this association. Clinicians with a higher proportion of their caseload including psoriasis patients were significantly more likely to be aware of the association between psoriasis and CVD (OR 3.05 [1.64, 5.68]; $p < 0.001$). Most clinicians nominated GPs as best placed to facilitate CV risk factor screening and management (dermatologists 80.2% (69/86); rheumatologists 83.9% (47/56); cardiologists 75.5% (40/53); GPs 88.3% (91/103)). Patients preferred specialist input and multidisciplinary care for CVD risk management; 34.3% (35/102) nominated a cardiologist as the preferred clinician, and 23.5% (24/102) indicated preference for a multidisciplinary team.

Limitations: The possibility of sampling and response bias, inherent in the study design, is acknowledged; however, responses are likely representative of clinician and patient sentiments on this issue and in keeping with similar study findings.

Conclusion: Clinician and patient knowledge of the relationship between psoriasis and CVD needs to be improved. The establishment of a national consensus approach to address this gap in clinical care is needed.

1 | Introduction

Psoriasis is a chronic multi-system inflammatory disease affecting 2%–4% of the population [1]. Important systemic implications include a heightened and accelerated risk of cardiovascular disease (CVD) [2–5]. Chronic inflammation, shared immunologic pathways upregulation of Th1/17 pathways, their pro-inflammatory cytokine mediators, including but not limited to interleukin (IL) IL-6, IL-12, IL-17, and IL-23, tumour necrosis factor alpha (TNF-α), along with shared atherosclerotic risk factors and genetic risk factors, provide pathophysiological explanations for the association between psoriasis and CVD [6–8]. Furthermore, psoriasis is associated with the metabolic syndrome [9, 10] which also drives increased CV risk. The higher prevalence of traditional CV risk factors such as hypertension, diabetes mellitus, dyslipidaemia, obesity, and smoking in this cohort also contributes to the higher risk of CV events [3, 4, 8].

Several observational studies have demonstrated that psoriasis, particularly severe psoriasis, is a risk factor for major adverse cardiovascular events (MACE), including myocardial infarction (MI), stroke and cardiovascular death, independent of traditional CV risk factors [11]. This accelerated cardiovascular risk is more pronounced in those who are young [11], and is typically associated with severe cutaneous disease [11]. This risk is not accurately captured by traditional CV risk assessment [12, 13] hence, some guidelines now incorporate a history of psoriasis in CV risk assessment [14–19]. One cohort study by Mehta et al. demonstrated that a history of severe psoriasis (defined as requiring systemic therapy or phototherapy), after adjusting for age, gender, diabetes, hypertension, tobacco usage, and hyperlipidaemia, conferred an additional 6.2% increase in absolute risk of 10-year MACE relative to the general population [13]. Similarly, it has been postulated that psoriasis patients have a 25% increase in relative risk for CVD, independent of smoking, obesity and hyperlipidaemia [20, 21]. While this risk appears to be related to disease severity, there is no specific threshold for which risk may exist, and those with limited skin involvement may still have significant systemic inflammation, with several studies showing increased CV risk in these settings [19, 22, 23]. Furthermore, comorbid burden, such as psoriatic arthropathy (PsA) may exacerbate CV risk, with PsA carrying a higher prevalence of cardiometabolic disease and greater risk of MACE [24]. While observational data suggest treatment of psoriasis may reduce CV risk, randomised controlled trials assessing treatments to reduce CV risk are inconclusive, and further studies are required to determine the impact of systemic therapies on CV risk reduction [25].

The 2019 joint American Academy of Dermatology (AAD)—National Psoriasis Foundation (NPF) guidelines recommend that all patients with psoriasis be informed of their increased risk of CVD/metabolic syndrome and be encouraged to have metabolic/CV risk assessments as per national guidelines [16]. The AAD-NPF guidelines endorse early and more frequent screening for hypertension, diabetes, and hyperlipidaemia in patients with psoriasis affecting over 10% of body surface area (BSA), or who are candidates for systemic or phototherapy, acknowledging the association between psoriasis severity and CVD. They also recommend dedicated lifestyle counselling in this cohort, including dietary and exercise modifications based on age and presence of certain CV risk factors [16].

Further, the AAD-NPF guidelines outline that CV risk prediction score models should entail a 1.5 multiplication factor when the patient meets disease severity criteria (BSA > 10% or a candidate for systemic or phototherapy) [16]. They also highlight that CV risk management may be performed by either a primary care physician (PCP) or another health care provider experienced in CV risk management or the dermatologist [16]. Similar detailed guidance is required in the Australian context.

Various studies have demonstrated variable and infrequent CV screening practices in psoriasis patients. Less than 30% of dermatologists, rheumatologists and PCPs performed global CV screening in psoriasis patients in a Spanish setting [26]. Approximately 1/5th of United States (US) dermatologists reported never screening or referring psoriasis patients for CV risk management [27]. CV Screening rates amongst PCPs (interchangeable with GPs) in psoriasis patients are also suboptimal [28]. A United Kingdom study of primary care-based CV screening and management in psoriasis patients demonstrated that 48% had at least one undetected risk factor for CVD, and most known CV risk factors were sub-optimally managed [28]. Parsi et al. identified that high numbers of PCPs and cardiologists were unaware of the greater risk of MACE amongst psoriasis patients relative to the general population. Less than half of the clinicians in their study routinely screened psoriasis patients for CV risk factors [29].

Compounding this issue is that patients with psoriasis appear to have insufficient awareness of related comorbidities, including CV risk. A Danish study highlighted that only 12%–15% of psoriasis patients were well-informed of the association of psoriasis with CVD and the metabolic syndrome [30]. An Australian study found that only 51% of psoriasis patients identified psoriasis as being a CV risk factor [31].

We hypothesized that there is a lack of recognition of cutaneous psoriasis as a CV risk factor amongst clinicians and psoriasis patients. This could influence whether psoriasis patients receive appropriate screening and treatment for CV risk factors as per international guidelines [16]. This study sought to assess knowledge of the association between psoriasis and CVD amongst Australian clinicians involved in the care of psoriasis patients and amongst Australian patients, and to clarify perspectives on CV risk factor screening and management.

2 | Methods

This cross-sectional study utilised an 11-question self-administered survey, distributed online and on paper to members of Australasian Specialty Medical Colleges, specialty societies, and psoriasis patients from public outpatient and private clinics. The survey addressed demographics, awareness of the psoriasis –CVD link, and perspectives on cardiovascular screening and management (see Supporting Information).

We aimed to recruit a convenience sample of 100 clinician members from the following craft groups: GPs, dermatologists, rheumatologists, cardiologists, and 100 psoriasis patients. Inclusion criteria for clinician participants included practising in Australia or New Zealand within the past 6 months and being Fellows of relevant Colleges. Patients required a medical diagnosis of psoriasis. The survey, implemented in Google Forms, included Likert scale and free-text options and was reviewed by a clinical epidemiologist. Pilot testing on focus groups refined its design.

Practicing fellows were invited through newsletters and communication channels of relevant Colleges and organisations, including Australasian College of Dermatology (ACD), Royal Australasian College of Physicians (RACP) (cardiologists and rheumatologists) and Royal Australasian College of General Practitioners (RACGP), The Rural Doctors Association of Australia, GP Supervisors Australia, Cardiac Society of Australia and New Zealand (CSANZ), the Australian Rheumatology Association (ARA), Group For Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) and major dermatology institutions (The Skin Hospital, Skin Health Institute). Psoriasis patients were approached through public hospital outpatient clinics and private practice settings. Informed consent was implied by survey completion. Participants were anonymous and could respond only once. Recruitment spanned 3 months, with initial emails and monthly reminders for clinicians. The study received ethics approval from the Western Sydney Local Health District Human Research Ethics Committee (2021/PID00294–2021/ETH00253).

2.1 | Statistical Approach

Descriptive statistics (frequency and percent) were used to summarise survey responses. Differences between groups were assessed using the Chi-squared test for categorical variables. Logistic regression analysis was performed to explore possible associations with clinician awareness of increased CVD risk and the gravity of this risk for patients with psoriasis. A multivariable model was fitted for age, gender, clinician specialty, duration practising in specialty and proportion of caseload that were psoriasis patients, with the outcome variable being awareness of the relationship between psoriasis and CVD. Survey responses were dichotomised to 'Yes' or 'Somewhat/No.' Caseload proportions were grouped (0%–5%, 5%–10%, > 10%) due to sparse data in higher categories. Adjusted marginal estimates and their 95% confidence intervals were reported to quantify agreement with the survey question across specialties. Additional logistic regression examined whether the aforementioned predictor variables were associated with the perception of psoriasis as a clinically relevant risk factor. Statistical analyses were performed using Jamovi 2.3.28 software, with $p < 0.05$ considered significant.

3 | Results

A total of 298 clinicians (dermatologists, rheumatologists, cardiologists, GPs) and 103 psoriasis patients participated. The most frequent age group for clinician respondents was 36–45 years, with a female predominance for rheumatologists at 58.9% (33/56). Male respondents were more common for dermatologists at 51.2% (44/86), cardiologists at 64.2% (34/53) and GPs at 51.5% (53/103). Most clinician respondents were solely practising as clinicians rather than working in both academic and clinical practice; most had been in clinical practice for 5–10 years. Clinician demographic characteristics are summarised in Table 1. Dermatologists and rheumatologists indicated the proportion of patients with psoriasis in their practice was 5%–10% of their clinical practice at 38.4% (3/86) and 44.6% (25/56) respectively, while cardiologists and GPs indicated this was < 5%, at 84.9% (45/53) and 68% (70/103) respectively.

3.1 | Knowledge of Psoriasis-CVD Association

Most dermatologists and rheumatologists indicated knowledge of the association between psoriasis and CVD: 98.8% (85/86) and 91.1% (51/56) respectively, while only 54.7% (29/53) of cardiologists and 29.1% (30/103) of GPs indicated knowledge of this association (see Table 2, Figure 1). Only 23.5% (24/102) of patients surveyed indicated knowledge of this association.

57% (49/86) of dermatologists acknowledged that psoriasis was associated with worse CV outcomes than the general population, followed by 51.8% (29/56) of rheumatologists, 50.9% (27/53) of cardiologists, and 35.9% (37/53) of GPs. 65.1% (56/86) of dermatologists regarded psoriasis as a relevant CV risk factor, followed by 58.9% (33/56) of rheumatologists, 17.0% (9/53) of cardiologists, and 19.4% (20/103) of GPs (see Table 2, Figure 2).

Logistic regression demonstrated that the proportion of patients seen with psoriasis showed a significant association with clinician knowledge of PSO-CVD ($p < 0.001$). Specifically, the group of clinicians with 5%–10% of their clinical practice being patients with psoriasis had 3.05 times higher odds (95% CI, [1.64, 5.68]) of knowledge of the PSO-CVD association compared to the reference group (0%–5% psoriasis patients). Those with > 10% of their patient load being psoriasis patients had 21.00 times higher odds (95% CI, 6.02–73.23) of knowledge of the psoriasis –CVD association compared to the reference group (0%–5% psoriasis patients). Clinician age was associated with knowledge of psoriasis –CVD, and clinicians in the 36–45-year-old age group had 2.73 times higher odds (95% CI, 1.07, 6.96) of being aware of the psoriasis –CVD association compared to the reference group (< 35 years of age).

Additionally, the second logistic regression model revealed that the proportion of patients seen with psoriasis correlated with knowledge of psoriasis as a relevant CV risk factor. Specifically, clinicians with 5%–10% of their clinical practice being psoriasis

TABLE 1 | Clinician demographic characteristics.

	Dermatologists ($n=86$)	Rheumatologists ($n=56$)	Cardiologists ($n=53$)	GPs ($n=103$)
Gender % (No.)				
Female	48.8 (42)	58.9 (33)	35.8 (19)	48.5 (50)
Male	51.2 (44)	41.1 (23)	64.2 (34)	51.5 (53)
Age group (years) % (No.)				
≤35	7.0 (6)	19.6 (11)	13.2 (7)	16.5 (17)
36–45	36.0 (31)	32.1 (18)	41.5 (22)	28.2 (29)
46–60	36.0 (31)	26.8 (15)	30.2 (16)	38.8 (40)
>60	21.0 (18)	21.4 (12)	15.1 (8)	16.5 (17)
Years in clinical practice % (No.)				
0–5	17.4 (15)	30.4 (17)	28.3 (15)	22.3 (23)
5–10	20.9 (18)	14.3 (8)	20.0 (11)	20.4 (21)
10–20	23.3 (20)	14.3 (8)	28.3 (15)	19.4 (20)
>20	38.4 (33)	41.1 (23)	22.6 (12)	37.9 (39)
Main job % (No.)				
Clinician	90.7 (78)	82.1 (46)	77.4 (41)	87.4 (90)
Combination (clinical/academic)	9.3 (8)	17.9 (10)	18.9 (10)	8.7 (9)
Researcher	0 (0)	0 (0)	3.80 (2)	0 (0)
Teacher/educator	0 (0)	0 (0)	0 (0)	1.9 (2)
Proportion of patients with psoriasis in their practice % (No.)				
0%–5%	27.9 (24)	16.1 (9)	84.9 (45)	68 (70)
5%–10%	38.4 (33)	44.6 (25)	5.7 (3)	23.3 (24)
10%–25%	40.2 (26)	32.1 (18)	0 (0)	3.9 (4)
25%–50%	2.3 (2)	3.6 (2)	0 (0)	1 (1)
>50%	0 (0)	3.9 (2)	0 (0)	0 (0)
Unsure	1.2 (1)	0 (0)	9.6 (5)	2.9 (4)

Abbreviation: GPs, general practitioners.

patients had 2.69 times higher odds (5% CI, [1.50, 4.82]) of regarding psoriasis as a relevant clinical risk factor compared with the reference group (0%–5% psoriasis patients). Those with more than 10% of their patient load being psoriasis patients had 6.03 times higher odds (95% CI, 2.96–12.29) of regarding it as a relevant clinical risk factor compared to the reference group (0%–5% psoriasis patients). No other significant associations were observed.

3.2 | CV Screening Practices Amongst Clinicians for Psoriasis Patients

Most clinicians (including GPs) nominated GPs as best positioned to facilitate CV risk factor screening, with 80.2% (69/86) of dermatologists, 83.9% (47/56) of rheumatologists, 75.5% (40/53) of cardiologists, and 88.3% (91/103) of GPs favouring GPs as the lead clinician. GPs were nominated by all clinicians as best placed to manage CV risk, with dermatologists 78% (74/86); rheumatologists 76.8% (43/56); cardiologists 49.1% (26/53); GPs 88.3% (91/103) indicating a preference for this. Depending on patient complexity, some clinicians indicated cardiologists should be involved in CV risk factor management (dermatologists 7.0% (6/86); rheumatologists 14.3% (8/56); cardiologists 17.0% (9/53); GPs 5.8% (6/103)).

The concept that effective treatment of psoriasis may improve CV risk, was best appreciated by dermatologists and rheumatologists with 69.8% (69/86) and 57.1% (32/56) respectively, agreeing with this statement, while only 13.2% (7/56) of cardiologists and 41.7% (43/103) of GPs acknowledged this concept (see Table 2).

Almost 64% (65/102) of patients indicated they had received CV risk factor screening in the last year, with GPs having performed this in 38.4% (38/102) of patients; cardiologists in 14.10% (14/102)

TABLE 2 | Clinician responses regarding the association between psoriasis and CVD, screening and management.

	Dermatologists ($n=86$)	Rheumatologists ($n=56$)	Cardiologists ($n=53$)	GPs ($n=103$)
Are you aware of the relationship between psoriasis and CVD % (No.)				
Yes	98.8 (85)	91.1 (51)	54.7 (29)	29.1 (30)
Somewhat	1.2 (1)	7.1 (4)	24.5 (13)	27.2 (28)
No	0 (0)	1.8 (1)	20.8 (11)	43.7 (45)
Is psoriasis associated with worse CV outcomes than the general population, % (No.)				
Agree	57.0 (49)	51.8 (29)	50.9 (27)	35.9 (37)
Strongly agree	30.2 (26)	39.3 (22)	15.1 (8)	10.7 (11)
Disagree	2.3 (2)	0 (0)	0 (0)	0 (0)
Strongly disagree	8.1 (7)	3.6 (2)	0 (0)	2.9 (3)
Neutral	2.3 (2)	5.4 (3)	34.0 (18)	50.5 (52)
Do you regard psoriasis as a clinically relevant risk factor (akin to Hypertension, Dyslipidaemia, Diabetes mellitus) % (No.)	9			
Yes	65.1 (56)	58.9 (33)	17.0 (9)	19.4 (20)
Somewhat	32.6 (28)	30.4 (17)	43.4 (23)	29.1 (30)
No	2.3 (2)	0.7% (6)	39.6 (21)	51.3 (53)
Given psoriasis patients are at increased risk of CVD and typically affected at a younger age than the general population who do you think should be screening for CV RF % (No.)				
GPs	80.2 (69)	83.9 (47)	75.5 (40)	88.3 (91)
Dermatologists	9.3 (8)	1.8 (1)	9.4 (5)	2.9 (3)
Cardiologists	1.2 (1)	3.6 (2)	5.7 (3)	1.0 (1)
Cardiologists according to complexity	0 (0)	0 (0)	5.7 (3)	1.0 (1)
Unsure	1.2 (1)	0 (0)	0 (0)	4.9 (5)
Other	8.1 (7)	10.7 (6)	3.8 (2)	2.0 (2)
Who do you think should be managing CV RF status in psoriasis patients %(No.)				
GPs	86.0 (74)	76.8 (43)	49.1 (26)	88.3 (91)
Dermatologists	1.2 (1)	0 (0)	0 (0)	0 (0)
Cardiologists	1.2 (1)	1.8 (1)	17.0 (9)	1.0 (1)
Cardiologists according to complexity	7.0 (6)	14.3 (8)	17.0 (9)	5.8 (6)
Unsure	1.2 (1)	0 (0)	3.8 (2)	1.0 (1)
Other	3.6 (3)	7.1 (4)	13.2 (7)	3.9 (4)
Please nominate your response to the following statement: Treating psoriasis can reduce the risk of CVD % (No.)				
Agree	69.8 (60)	57.1 (32)	28.3 (15)	41.7 (43)
Strongly agree	11.6 (10)	3.6 (2)	13.2 (7)	4.9 (5)
Neutral	17.4 (15)	37.5 (21)	50.9 (27)	47.6 (49)
Disagree	1.2 (1)	0 (0)	5.7 (3)	1.9 (2)
Strongly disagree	0 (0)	1.8 (1)	1.9 (1)	3.9 (4)

Abbreviation: GPs, general practitioners.

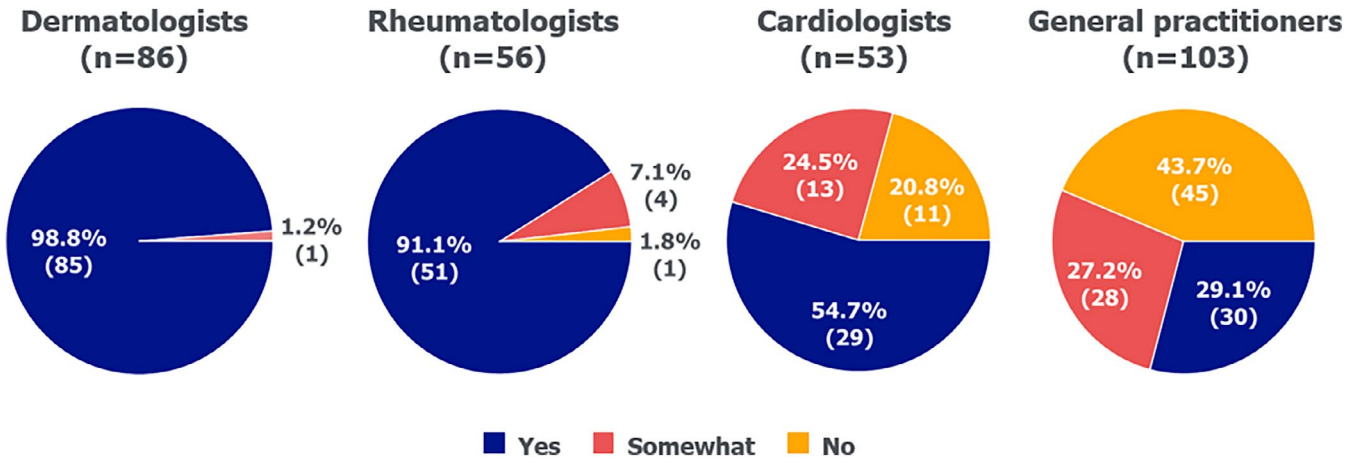

FIGURE 1 | Clinician knowledge of the association between CVD and psoriasis. "Are you aware of a relationship between cardiovascular disease (CVD) and psoriasis?".

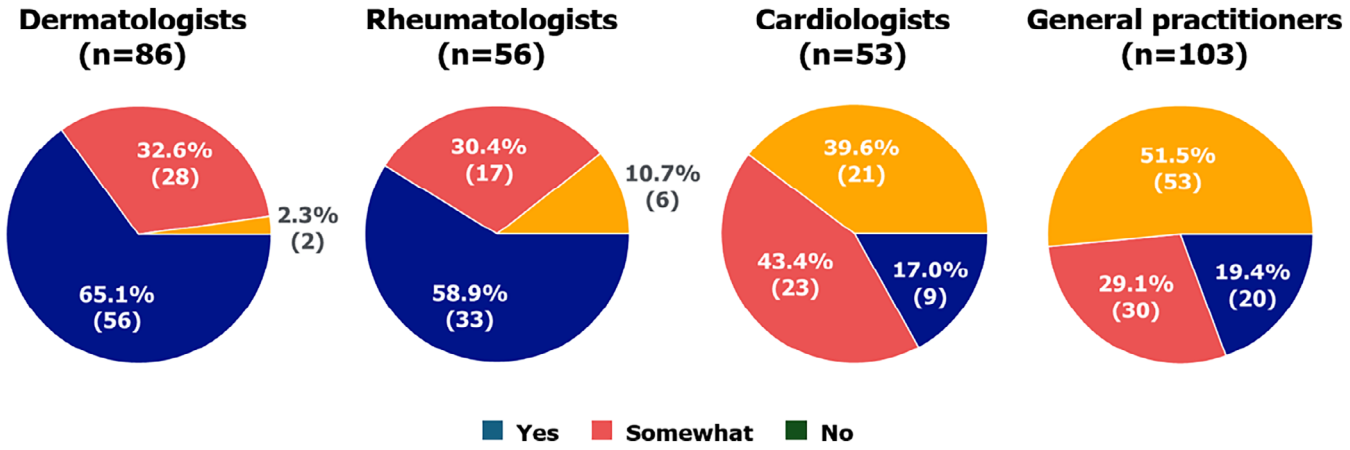

FIGURE 2 | Clinician regard for psoriasis as a clinically relevant cardiovascular risk factor. "Do you regard Psoriasis as a clinically relevant cardiovascular risk factor (i.e. akin to hypertension, dyslipidaemia, diabetes mellitus?".

and dermatologists in 6.9% (9/102) of patients. Most patients, 68.6% (70/102) were not known to a cardiologist. Overall, 34.3% (35/102) of patients nominated cardiologists as their preferred specialist to conduct CV screening and management, 23.5% (24/102) nominated multidisciplinary teams comprising all relevant clinicians, 17.6% (18/102) nominated GPs, and 6.9% (7/102) nominated dermatologists.

4 | Discussion

4.1 | Main Findings

This study demonstrates an overall lack of clinician awareness regarding the link between psoriasis and CVD. Overwhelmingly, clinicians nominated GP-led screening and management of CV risk as the preferred option for addressing CV risk in psoriasis patients. In contrast, patients opted for specialist-led multidisciplinary intervention. The lack of GP, cardiologist, and patient awareness of CV risk in this cohort, coupled with the lack of cohesive national guidance regarding clinician responsibility for CV screening and management, reveals a critical gap in care.

4.2 | Clinician Awareness of CVD and Psoriasis

This study supports the need for heightened awareness and education regarding the psoriasis– CVD link amongst clinicians and patients to ensure early identification and intervention in high-risk individuals. Our findings suggest targeting GPs, cardiologists, and patients should be the primary focus of future educative efforts.

In keeping with our study findings and others, it was expected that clinicians in frequent contact with psoriasis patients (i.e., dermatologists and rheumatologists) may be more aware of the PSO-CVD association [29]. However, the gravity of this association was not concordantly appreciated by these clinicians. Cardiologists and GPs' awareness of the PSO-CVD link was low in the Australian context. These findings are supported by those reported in a Spanish setting [26], where rates of CV screening in psoriasis patients were low amongst cardiologists, potentially reflecting poor knowledge of the PSO-CVD association and relatively small numbers of psoriasis patients these clinicians encounter, as highlighted in our study. Our study showed that knowledge of the PSO-CVD association and psoriasis as a clinically relevant CV risk factor was related to the proportion of

psoriasis patients seen. Similarly, Parsi et al. demonstrated that physicians caring for a greater number of psoriasis patients were significantly more likely to screen for CV risk factors [29].

4.3 | Clinician and Patient Perspectives on CV Screening and Management Practices in Psoriasis Patients

Clinicians favoured GPs as best placed to screen and manage CV risk; smaller numbers nominated cardiologist involvement according to patient complexity (Figure 2). The preference for GP involvement poses an issue, with our study highlighting limited awareness of the PSO-CVD association amongst GPs, compounded by a lack of patient awareness. While a primary care-based approach to screening/management of CV risk factors is recommended by guidelines, including the updated Australian consensus on psoriasis management [32], in practice, screening is usually shared by both specialists and GPs, and a collaborative-care approach is likely to best address the needs of this cohort [33]. With high-risk patient subgroups, cardiologist input may be appropriate, albeit definition is required to determine the threshold for specialist cardiology intervention in this cohort [29].

Dermatologists and rheumatologists, as primary caregivers for psoriasis patients, can incorporate CV screening and risk discussions into routine care. Evidence suggests patients respond better to disease and lifestyle discussions when built on strong therapeutic relationships [34]. Both specialists and GPs/PCPs lend themselves to this approach, though a specialist-led model, favoured by patients and supported by Barbieri et al. [35], may hold merit, particularly for complex cases. Dermatologists have indicated a need for education and clinical support to facilitate CV risk screening and preventative management [33]. Concordantly, targeted education on this issue has been associated with improved rates of dermatologist-led CVD counselling and PCP referral for CV risk assessment [36]. Educational programs and national frameworks are essential for enhancing clinician screening, counselling, referral and management practices.

4.4 | Considerations for Policy and Practice

Challenges with the primary-care-based model for CVD risk management in psoriasis patients, as advocated by guidelines [15, 32] include reliance on patient contact with PCPs, which varies according to healthcare system approaches to care [37, 38], and may limit effectiveness. A collaborative approach, where the lead clinician for psoriatic disease (dermatologist or rheumatologist) educates patients about the PSO-CVD link and directs GP-led screening and management, may address care gaps. Dermatologists and rheumatologists could play a greater role in screening/management, supported by a US study showing two thirds of dermatologists willing to facilitate screening and, to a lesser extent, management, with adequate support [35]. Future studies on the feasibility and outcomes of a specialist-led multidisciplinary approach will inform future care directions [33]. Patient desire for specialty-led management and multi-disciplinary care highlights the need for greater emphasis on these approaches in current models of psoriatic disease care [39, 40].

Gaps in clinician screening and management of CV risk in psoriasis patients may stem from limited awareness of the increased risk, time constraints, perceptions that it falls outside routine practice, insufficient knowledge of CV prevention strategies, and lack of specific guidelines or systemic support. Additionally, while observational data support the PSO–CVD link, the lack of robust randomised trials with hard clinical endpoints assessing the benefit of targeting cutaneous and systemic inflammation to reduce CV risk may be why some clinicians remain dubious about the benefits of aggressively treating psoriasis to improve CV outcomes [25].

In Australia, national guidance is needed for CV screening, management, and prevention in psoriasis patients to clarify clinician responsibility within a collaborative care approach and to establish a standard of care. We propose that dermatologists participate in CV screening as appropriate and/or direct GPs (PCPs) to facilitate screening and management, with cardiologist input based on patient risk (Figure 3). Additionally, the specific inclusion of psoriasis as a cardiovascular risk modifier

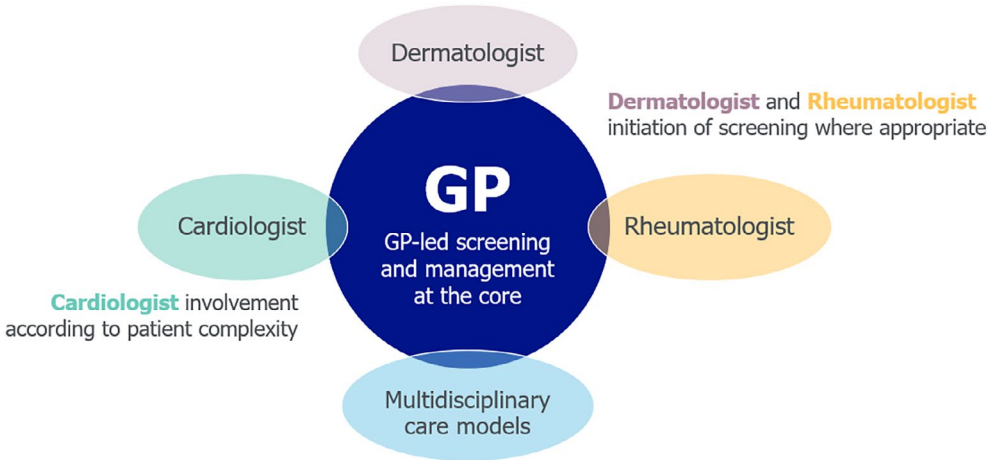

FIGURE 3 | Proposed collaborative care model for CVD prevention in patients with psoriasis. GP-led screening and management is central. Cardiologist involvement may be required for more complex patients. Dermatologist and rheumatologist initiation of CV screening may be appropriate with GP-directed management. CVD, cardiovascular disease; PsO, psoriasis; GP, general practitioner.

in the Australian CVD Risk guidelines [41]—aligning with international standards [42]—may help raise clinician awareness of this issue, especially amongst GPs, and better promote collaborative care.

Further studies are needed to assess whether specialist-led strategies and collaborative care with GPs/PCPs, supported by appropriate education, can improve outcomes in this cohort [33].

4.5 | Limitations

The possibility of sampling and response bias in survey-based studies is acknowledged. However, responses are likely representative of clinician and patient sentiments and align with similar study findings. Lower response rates in some clinician cohorts mean these findings may not be generalisable to non-responders. COVID-related impact at the time of survey distribution may have affected uptake and engagement.

5 | Conclusion

Psoriasis patients are at significantly increased risk of CVD, owing to accelerated atherosclerosis with increased morbidity and mortality. Gaps in care pertaining to CV risk exist. This study adds strength to the notion that there is insufficient awareness of the association of psoriasis and CVD amongst relevant specialist clinicians and GPs, in addition to psoriasis patients. Collaborative, multidisciplinary care is needed to address these gaps. Improved education targeting specific clinician groups and patients, accompanied by professional guidance, is needed to elevate the standard of care in this patient group.

Author Contributions

Annika Smith: concept and design, execution, drafting manuscript, supervision. **Belinda Lai:** data acquisition, revision, approval. **Fiona Foo:** data acquisition, review and approval. **Katy J. L. Bell:** design, review and editing. **Peter Wong:** review and editing. **Pablo Fernandez-Penas:** review and editing. **Sarah Zaman:** review and editing. **Clara K. Chow:** review and editing.

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Disclosure

This work has not been previously presented or published. This manuscript meets all requirements for the article type being submitted.

Conflicts of Interest

Dr. Pablo Fernandez-Penas is an Editorial Board member of Australasian Journal of Dermatology and a co-author of this article. To minimise bias, they were excluded from all editorial decision-making related to the acceptance of this article for publication.

Data Availability Statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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