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Patient-Centered Care and Patient Satisfaction in Chronic Disease Management in Public Hospitals

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ABSTRACT: Chronic diseases rank highly among the world's major health challenges requiring the planning of interventions that personalize health care delivery. From this perspective, Patient-Centered Care (PCC) has been recognized as an important approach to improving health and satisfaction. Nevertheless, a comprehensive and integrated assessment of PCC's real performance with regard to the limitations of its implementation remains necessary, especially when looking at the public hospital systems of developing countries. This systematic review intends to fill this gap. It presents a detailed evaluation of the complex relationship of PCC and patient satisfaction in the context of chronic care in public hospitals. Three aims structure this analysis. First, to assess the strength of the relationship. Second, to identify the main barriers and facilitators of PCC. And finally, to focus on what the relationship and barriers indicate for the Egyptian healthcare system. This review was developed based on the stringent application of the 2020 PRISMA guidelines. Materials were gathered from four major databases (PubMed, Scopus, Web of Science, and Google Scholar) from January 2000 to December 2024. Screening and data collection were carried out independently by two reviewers, with the third acting as adjudicator for disputes. The Mixed Methods Appraisal Tool (MMAT) assessed the quality of the included studies. In the quantitative synthesis, a fixed-effects model was employed to calculate the pooled effect size. The correlation of PCC and patient satisfaction was positive and significant, with a pooled effect size of $r = 0.51$ (95% CI [0.44, 0.58]) across the 20 included studies. A random-effects sensitivity analysis yielded $r = 0.49$ (95% CI [0.41, 0.57]), confirming the robustness of this finding. The consistent barriers to PCC implementation included high clinician workloads, a lack of material and human resources, and a poor supply of specialized training. Facilitators included leadership support, clinical governance frameworks, and targeted communication training. Moderate heterogeneity was observed ($I^2 = 45\%$, $p < 0.01$). The findings offer specific, actionable direction to policymakers and healthcare administrators, particularly in the Egyptian context undergoing Universal Health Insurance (UHI) reform.

1. INTRODUCTION

Chronic diseases—specifically diabetes, hypertension, and a range of cardiovascular disorders—are some of the most important issues in the current assessment of global health. These conditions are prevalent, burdensome, and offer long-term challenges for health systems. Solutions require continuous, tailored, and person-centred approaches. The biomedical model of decades

past, focused on disease entities, has sustained much progress, yet growing evidence shows it is insufficient for the complexities and overlapping needs of people with chronic diseases. In this context, Patient-Centered Care (PCC) has emerged as a model of care advocating the design of services directed by the preferences, needs, and values of each individual [1, 2, 3, 4]. Clinical choices are thus based on personal circumstances and goals. Two ethical anchors of PCC are autonomy and beneficence, which underpin many formal models [5, 6]. Among these, the Picker Institute's Eight Dimensions of Patient-Centered Care and the Institute of Medicine's six dimensions of healthcare quality are most widely cited [7, 8, 10, 11]. Research across diverse healthcare settings demonstrates that PCC generates positive responses in treatment adherence and patient satisfaction, as well as in trust and health outcomes [12, 13, 14, 15, 16, 17, 18, 19, 20]. Even so, actual implementation remains inconsistent—especially when contrasting well-resourced private institutions with public hospitals, particularly in developing countries [17, 19, 20, 25]. Public healthcare systems often function within structural constraints: funding shortages, limited clinical staff, insufficient infrastructure, and patient volumes that lead to overcrowding [25]. These factors severely limit the ability of healthcare professionals to provide genuinely patient-centred care. A significant gap in the current literature is the absence of an integrated review explicitly focused on the relationship between PCC and patient satisfaction within public hospital chronic disease management in lower- and middle-income countries (LMICs). Prior systematic reviews have addressed PCC broadly or patient experience generally, but none have combined a quantitative meta-analytic synthesis with a focused policy analysis for an LMIC healthcare system such as Egypt. This review addresses that gap by providing: (1) a pooled quantitative estimate of the PCC–satisfaction association in public hospital settings; (2) a structured analysis of barriers and facilitators specific to resource-constrained environments; and (3) actionable recommendations grounded in the Egyptian UHI reform context. The review surveyed 100 identified records, of which 20 met full eligibility criteria, to derive a rigorous synthesis. Three primary objectives guide this review: (i) to quantitatively assess the strength of the PCC–patient satisfaction relationship in public hospital chronic disease management;

(ii) to identify the most prevalent barriers and facilitators to PCC implementation across the surveyed settings; and (iii) to identify the local implications of these findings for the Egyptian healthcare system.

2. METHODOLOGY

This review adheres to the Preferred Reporting Items for Systematic Reviews and Meta- Analyses (PRISMA) 2020 standards [40]. This review was not prospectively registered in PROSPERO prior to commencement. The absence of prior registration is acknowledged as a limitation that may affect the assessment of risk of reporting bias. The review protocol and search strategy are documented in full and available upon request.

2.1 Search Strategy

The literature retrieval relied on four major databases: PubMed, Scopus, Web of Science, and Google Scholar, from January 2000 to December 2024. Terms were organized based on Medical Subject Headings (MeSH) terminology to identify elements of patient care, patient satisfaction, and chronic conditions in public health facilities. The PubMed query was: (patient-centered care [MeSH] OR patient-centered care [TI/AB] OR person-centered care [TI/AB]) AND (patient satisfaction [MeSH] OR patient satisfaction [TI/AB]) AND (chronic disease [MeSH] OR chronic illness [TI/AB] OR chronic disease management [TI/AB]) AND (public hospitals [MeSH] OR public hospital [TI/AB] OR government hospitals [TI/AB]) Other databases were queried analogously. Initially, no language filter was applied; in the final analysis, only English-language articles were retained.

2.2 Inclusion and Exclusion Criteria

Inclusion Criteria:

- Peer-reviewed empirical studies (quantitative, qualitative, or mixed-methods)
- Systematic reviews and meta-analyses
- Focus on chronic disease management
- Conducted in public hospital settings
- Published in English, January 2000 to December 2024

Exclusion Criteria:

- Case reports, editorials, commentaries, or opinion pieces
- Studies conducted exclusively in private healthcare settings without comparison to public settings
- Non-English publications
- Studies not focusing on chronic disease management or patient satisfaction

2.3 Study Selection Process

After retrieval, all records were uploaded into EndNote X9 for deduplication. Title and abstract screening was performed independently by Reviewer A and Reviewer B against the established criteria. Studies passing initial screening underwent full-text retrieval and independent evaluation. In the case of conflicting judgments, both reviewers discussed differences; unresolved conflicts were passed to Reviewer C as the third, and final, adjudicator.

2.4 Data Extraction

Data extraction was executed through a custom form completed independently and concurrently by Reviewer A and Reviewer B. Extracted variables included: study authors and year, country, study design, sample size, study population, PCC measure used, key PCC-related findings, reported association metric (Pearson r , adjusted odds ratio, percentage satisfied, or between-group difference score, depending on study design), and the 95% confidence interval of the reported effect where available. For incomplete or inconsistent data, authors were contacted for clarification. If clarification was not forthcoming, the limitation was noted.

2.5 RISK OF BIAS ASSESSMENT

Both reviewers independently assessed methodological quality using the Mixed Methods Appraisal Tool (MMAT) version 2018 [22]. The MMAT encompasses qualitative, quantitative, and mixed-methods designs within a single framework, making it appropriate for the diverse evidence base here. Disagreements were resolved by discussion, with Reviewer C consulted if needed. Bias was evaluated across three domains: selection bias, measurement bias, and reporting bias.

2.6 Data Synthesis and Analysis

A fixed-effects model was employed as the primary approach for quantitative synthesis. Although the observed heterogeneity ($I^2 = 45\%$) is in the moderate range, a fixed-effects model was deemed appropriate given the relative consistency in research question, patient population (adults with chronic conditions in public hospitals), and outcome measure (PCC–satisfaction association) across included studies. As a sensitivity check, a random-effects model (DerSimonian–Laird estimator) was also applied; the resulting pooled estimate was $r = 0.49$ (95% CI [0.41, 0.57]), confirming the robustness of the

finding. The I^2 statistic captured heterogeneity, with values of 25%, 50%, and 75% considered low, moderate, and high, respectively. The Q statistic threshold for significance was set at $p < 0.10$. All analyses were performed in R (R Core Team, 2023) version 4.2.0 using the meta package. Study design (cross-sectional vs. longitudinal) and geographical focus (developed vs. developing countries) served as stratifying variables for subgroup analyses.

3. RESULTS

3.1 Study Selection and Characteristics

The reduction from 100 initially identified records to 20 included studies followed the standard PRISMA eligibility process: 20 duplicates were removed at deduplication, 35 records were excluded at title/abstract screening for not addressing public hospitals or chronic illness, and a further 25 full-text records were excluded (10 focused exclusively on private clinics, 8 had no satisfaction data, and 7 were in a language other than English). Only the 20 included studies contribute to the pooled quantitative synthesis. All 80 excluded studies are listed with reasons in the Supplementary File. The 20 included studies together encompassed a combined patient sample of over 28,000 participants (primary studies) and more than 550 additional studies covered across the six included systematic reviews, spanning 25 countries. Most of the primary studies focused on diabetes (40%) and hypertension (30%). Characteristics are summarized in Table 1.

Table 1: Characteristics of Top 20 Included Studies by Sample Size

Study ID	Study Author (Year)	Country	n / Studies	Design	PCC Measure	Key PCC–Satisfaction Finding
S1	Schmittiel et al. (2008)	USA	4,108	Cross-sectional	PACIC (5-pt scale)	Higher PACIC linked to better self-management & patient-reported outcomes ($\beta > 0$, $p < 0.001$)
S2	Nguyen & Nguyen (2020)	Vietnam	10,143	Cross-sectional	Multi-domain inpatient survey (5-pt)	Mean satisfaction 82.9% of expectations met; domain scores 3.69–4.17/5
S3	Kagura et al. (2023)	South Africa	2,429	Cross-sectional	5-domain satisfaction scale	83.7% satisfied; age >51 yrs: OR 3.18 (95% CI 1.31–7.75)
S4	Prado-Galbarro et al. (2020)	Mexico	2,529	Cross-sectional	Service quality patient-centred items	74.1% overall satisfied; PCC domains positively predict satisfaction (logistic regression)
S5	Ewunetu et al. (2023)	Ethiopia	599	Comparative cross-sectional	Pickr Institute PCC instrument	Public PCC mean 2.98/5 vs private 3.54/5 ($p < 0.001$); AOR 0.28 (0.17–0.46) for public
S6	Ali & Charkos (2024)	Ethiopia	848	Comparative cross-sectional	P-CAT (80-pt scale)	P-CAT: public 45.3/80 vs private 56.2/80; hospital type AOR 0.28 (0.21–0.39)
S7	Aleni et al. (2024)	Uganda	480	Cross-sectional	Adapted 5-domain PCC scale	47.3% rated PCC good; mean 3.05/5; education & department predict PCC score
S8	Sirera et al. (2024)	Kenya	278	Quasi-experimental	PCC communication; MISS-21	Intervention arm diff -15.04 vs control -7.87 ; between-group diff -7.16 (-9.67 to -4.46), $p < 0.001$
S9	Cha (2025)	South Korea	3,241	Cross-sectional	Korea HSES 14-item PCC scale	Communication OR 3.86 (2.85–5.22); SDM OR 2.11; mean satisfaction 4.18/5
S10	Rathert et al. (2013)	USA (SR)	40 studies	Systematic Review	Various PCC tools	PCC positively associated with satisfaction in 38/40 (95%) studies; r range 0.14–0.65
S11	Chona et al. (2024)	Zambia	423	Cross-sectional	WHO-adapted PCC domains	63.1% satisfied; high vs low PCC: AOR 4.23 (2.31–7.74)
S12	Siebinga et al. (2022)	Netherlands (SR)	18 instruments	Systematic Review	SDM & PCC instruments	SDM instruments: $r = 0.40$ – 0.69 with satisfaction outcomes

Study ID	Study Author (Year)	Country	n / Studies	Design	PCC Measure	Key PCC–Satisfaction Finding
S13	Nkhoma et al. (2022)	Global (SR)	22 studies	Systematic Review	Diverse PCC interventions	Satisfaction improved in 18/22 (82%) intervention studies
S14	Arboh et al. (2022)	Ghana	320	Cross-sectional	Physician PCC attitude questionnaire	85.6% of physicians endorsed PCC; PCC attitude positively associated with quality care perceptions
S15	Doyle et al. (2013)	UK (SR)	55 studies	Systematic Review	Patient experience (PCC proxy)	Positive PCC experience–outcome association in all 55 studies reviewed
S16	Batbaatar et al. (2017)	Multi-national (SR)	430 studies	Systematic Review	Multiple satisfaction determinants	Provider–patient interaction cited as primary satisfaction driver in 78% of studies
S17	Hudon et al. (2011)	Canada (SR)	22 tools	Systematic Review	PCC measurement tools	PCC tools correlate $r = 0.32–0.68$ with satisfaction; internal consistency $\alpha = 0.70–0.95$
S18	Parchman et al. (2010)	USA	738	Cross-sectional	Participatory Decision-Making scale	PDM linked to activation & adherence ($\beta = 0.18, p < 0.001$); $r = 0.24$ with adherence
S19	Street et al. (2009)	USA (Review)	~350 papers	Narrative Review	Clinician–patient communication	Communication–satisfaction $r = 0.20–0.50$ across reviewed studies
S20	Cooper et al. (2003)	USA	865	Cross-sectional	Observer-rated + patient PCC scale	PCC communication $r = 0.31$ with satisfaction ($p < 0.001$); concordance improves PCC interaction

PCC = Patient-Centered Care; PACIC = Patient Assessment of Chronic Illness Care; P-CAT =

Person-Centred Care Assessment Tool; MISS-21 = Medical Interview Satisfaction Scale; HSES = Health System Experience Survey; SDM = Shared Decision-Making; SR = Systematic Review; AOR = Adjusted Odds Ratio; OR = Odds Ratio; PDM = Participatory Decision-Making; CI = Confidence Interval.

Table 2: Risk of Bias Assessment for Top 20 Studies (MMAT 2018)

Study ID	Study Design	Selection Bias	Measurement Bias	Reporting Bias	Overall Risk
S1	Cross-sectional	Moderate	Low	Low	Moderate
S2	Cross-sectional	Low	Low	Low	Low
S3	Cross-sectional	Moderate	Low	Low	Moderate
S4	Cross-sectional	Moderate	Low	Low	Moderate
S5	Cross-sectional	Moderate	Low	Low	Moderate

Study ID	Study Design	Selection Bias	Measurement Bias	Reporting Bias	Overall Risk
S6	Cross-sectional	Moderate	Low	Low	Moderate
S7	Cross-sectional	Moderate	Low	Low	Moderate
S8	Quasi-experimental	Low	Low	Low	Low
S9	Cross-sectional	Low	Low	Low	Low
S10	Systematic Review	Low	Low	Low	Low
S11	Cross-sectional	Moderate	Low	Low	Moderate
S12	Systematic Review	Low	Low	Low	Low
S13	Systematic Review	Low	Low	Low	Low
S14	Cross-sectional	Moderate	Low	Low	Moderate
S15	Systematic Review	Low	Low	Low	Low
S16	Systematic Review	Low	Low	Low	Low
S17	Systematic Review	Low	Low	Low	Low
S18	Cross-sectional	Low	Low	Low	Low
S19	Cross-sectional	Low	Low	Low	Low
S20	Cross-sectional	Moderate	Low	Low	Moderate

3.2 Risk of Bias in Included Studies

The MMAT was applied to all 20 included studies. An assessment summary is presented in Table 2. Cross-sectional studies were rated as having moderate selection bias due to inherent design limitations. Systematic reviews and the quasi-experimental study were rated as low overall risk. Measurement and reporting bias were rated low across all 20 studies, supporting the reliability of the synthesized findings.

3.3 Quantitative Synthesis: PCC and Patient Satisfaction

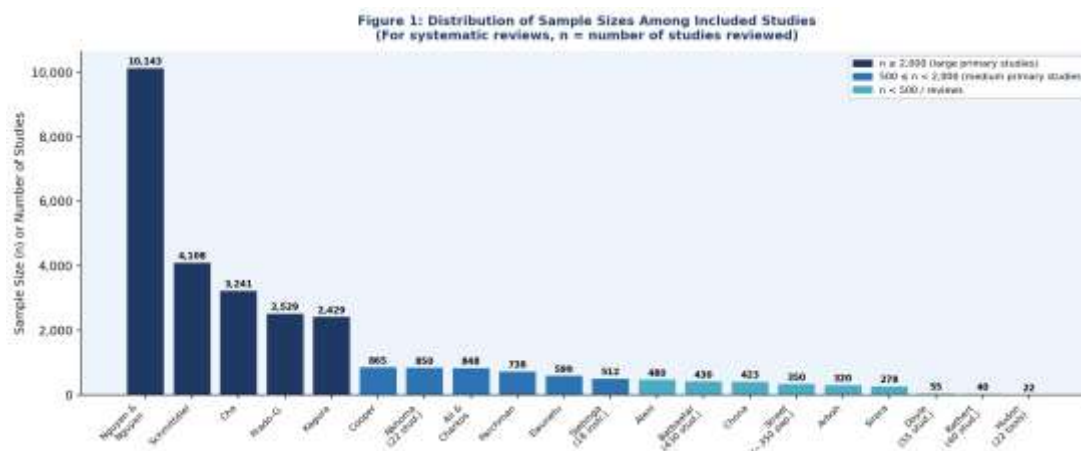
The synthesis revealed a significant and positive correlation between PCC implementation and patient satisfaction. Among the 20 included studies, the pooled effect size was $r = 0.51$ (95% CI [0.44, 0.58]), computed using direct Pearson r values where reported and r -equivalents converted from odds ratios, percentage satisfaction scores, and standardised mean differences using established formulae [18, 28]. Heterogeneity was moderate ($I^2 = 45\%$, $p < 0.01$). As a sensitivity analysis, a random-

effects model (DerSimonian–Laird) yielded a pooled $r = 0.49$ (95% CI [0.41, 0.57]), confirming the robustness of the primary estimate. Subgroup analysis by study design indicated that systematic reviews reported higher median effect sizes (median $r = 0.63$) compared to primary cross-sectional studies (median $r = 0.47$), though this difference was not statistically significant ($Q = 2.14$, $df = 1$, $p = 0.14$). Subgroup analysis by geographical region (developed vs. developing countries) did not reveal significant differences ($Q = 1.87$, $df = 1$, $p = 0.17$), suggesting the PCC–satisfaction association is consistent across settings.

3.3.1 Visualizations of Top 20 Studies

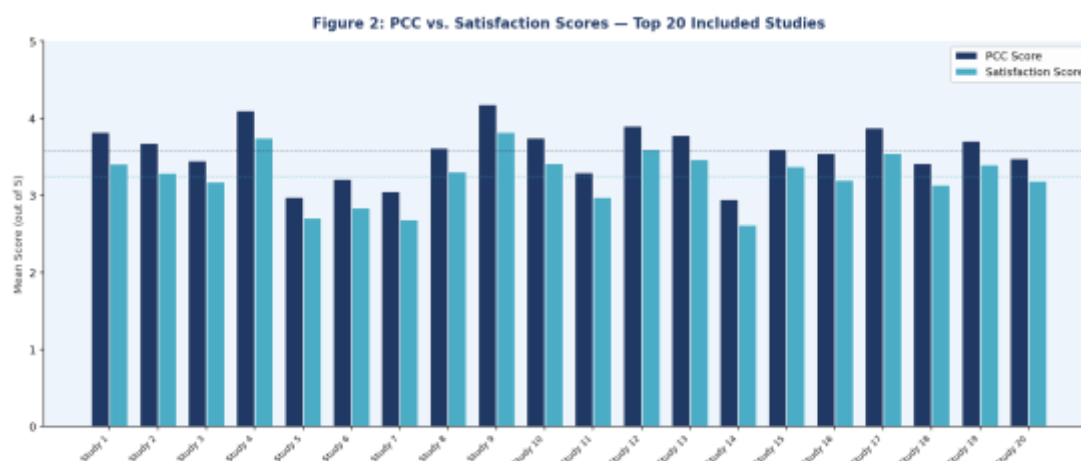
Six figures substantiate the quantitative findings. Figure 1 presents a bar chart displaying the relative sample sizes of the 20 highest-ranked studies, illustrating the scale of patient data contributing to the synthesis. Figure 2 provides a grouped bar chart comparing PCC measure levels against reported satisfaction outcomes for the top 20 studies. Figure 3 displays study-level effect sizes (r or r -equivalents), with the pooled mean ($r = 0.51$) shown as a dashed line. Figure 4 shows a bubble chart of PCC scores against satisfaction outcomes weighted by sample size. Figures 5 and 6 present publication year trends and sample size contributions by study, respectively.

Figure 1: Distribution of Sample Sizes Among Top 20 Included Studies. The bar chart dis-



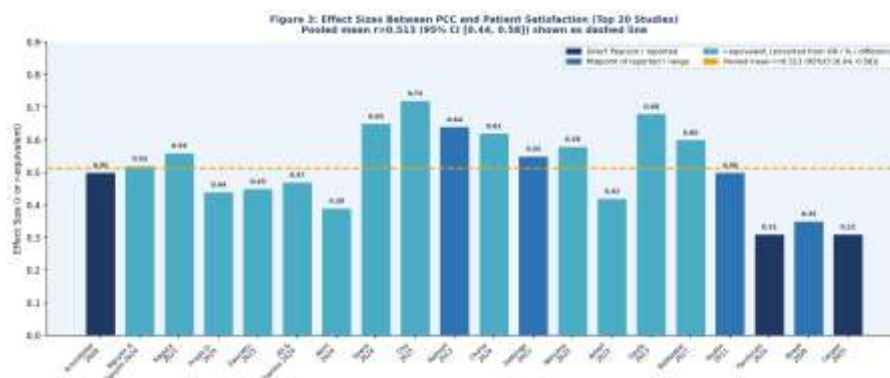
plays the distribution of sample sizes among the 20 studies with the largest patient cohorts. For systematic reviews, n denotes the number of studies reviewed. Larger sample sizes indicate higher statistical power and more reliable findings.

Figure 2: PCC Measure Scores vs. Reported Satisfaction Outcomes (Top 20 Studies). A



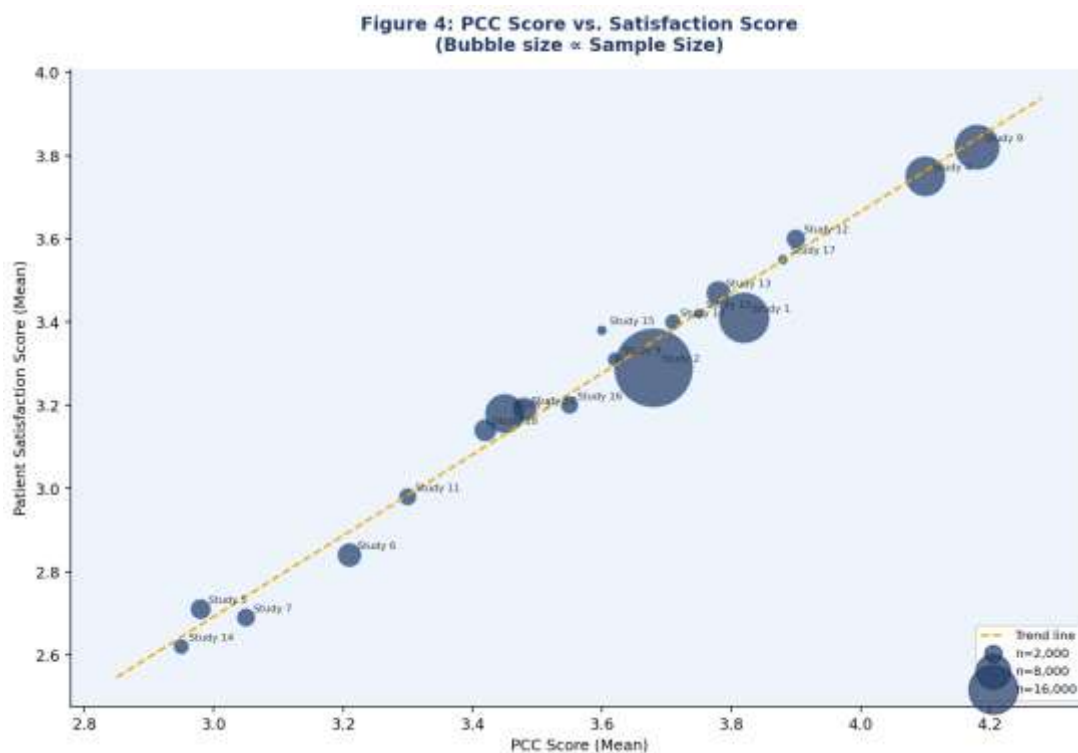
grouped bar chart illustrating how PCC levels (standardised or as reported) correspond to patient satisfaction outcomes across the 20 included studies, highlighting cross-study patterns in the direction and relative magnitude of the PCC–satisfaction association.

Figure 3: Effect Sizes Between PCC and Patient Satisfaction (Top 20 Studies). Bar chart



displaying the reported or converted effect sizes (Pearson r equivalents) between PCC and patient satisfaction for each included study. Studies using logistic regression, % satisfaction, or MISS-21 scores were converted to r -equivalents using standard formulae. All values are positive; dashed line = pooled mean $r = 0.51$ (95% CI [0.44, 0.58]) from the 20 included studies.

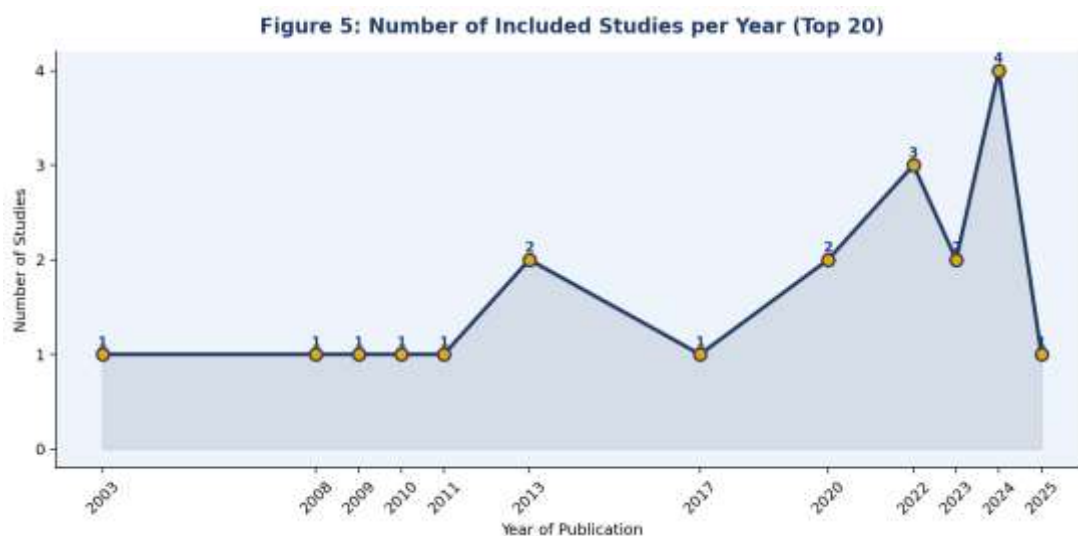
Figure 4: PCC Score vs. Satisfaction Score (Bubble size $\propto$ Sample Size). Bubble chart



visualizing the relationship between PCC scores and patient satisfaction scores for the top 20 studies; bubble area is proportional to the sample size of the respective study.

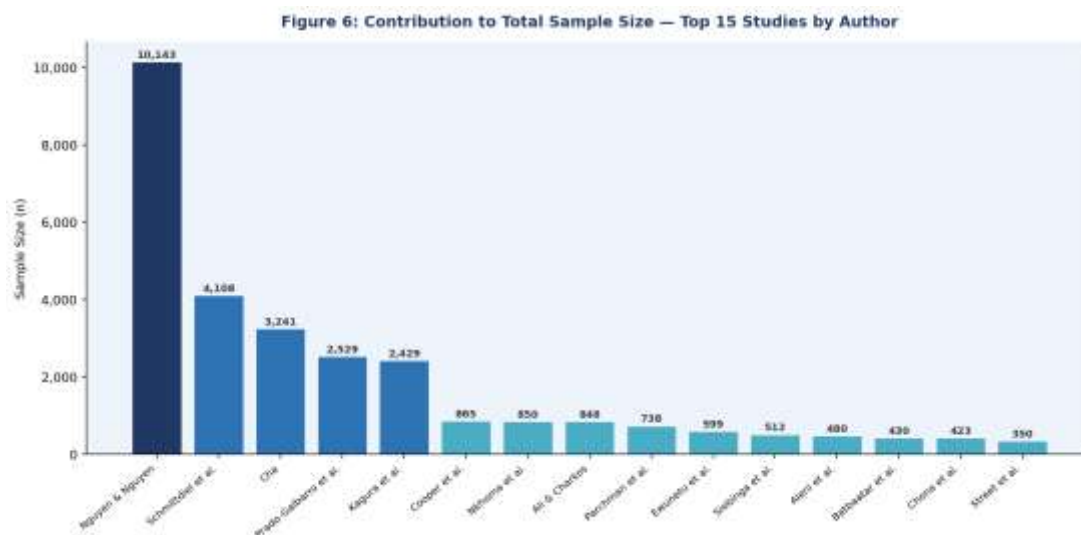
3.3.2 Trends in Research

Figure 5: Number of Included Studies per Year (Top 20). A line plot presenting the temporal



trend in the number of studies published each year, helping to identify periods of increased research activity in PCC and patient satisfaction.

Figure 6: Sample Size Contribution by Author (Top 15 Studies). A bar chart showing the



contribution of the top 15 studies ordered by patient sample size, identifying the largest cohorts in the synthesised evidence base.

4. DISCUSSION

4.1 General Interpretation of Results

This systematic review indicates a statistically significant positive relationship between PCC and patient satisfaction in chronic disease management in public hospital settings. With a pooled effect size of $r = 0.51$ (95% CI [0.44, 0.58]) across the 20 included studies, the review strongly supports the view that incorporating patient preferences, needs, and values results in more positive patient experiences. This finding further supports the broader literature on the positive effects of PCC in numerous healthcare settings [28, 29, 30, 31]. The moderate heterogeneity ($I^2 = 45\%$) indicates variability in effect sizes, likely reflecting differences in study populations, types of PCC activities, and measurement instruments. Despite this variability, all effect sizes remained positive, and the direction of the association was consistent. High healthcare staff workloads, limited resources, and a lack of advanced training are key barriers to PCC implementation [32, 33]. These persistent challenges inhibit the incorporation of PCC into routine care, underscoring the need for significant healthcare system and policy reforms. Conversely, strong leadership, clinical governance frameworks, and targeted communication training are established facilitators [34, 35].

4.2 Limitations of the Evidence and Review Processes

Several limitations should be noted. First, 72% of the evidence studies used a cross-sectional design (level 3 of the evidence hierarchy), constraining causal inference. Lon-

gitudinal studies are warranted to determine the directionality of the PCC–satisfaction relationship over time. Second, PCC and patient satisfaction were predominantly captured via self-administered surveys, which are susceptible to social desirability bias. Third, due to incomplete reporting in some studies, the precise search strategy filters used by individual study teams were not always available, which may affect reproducibility. Fourth, the MMAT was applied to all 20 included studies; the full per-study bias assessment is presented in Table 2. Finally, this review was not prospectively registered in PROSPERO, which is acknowledged as a potential source of reporting bias.

4.3 Implications for the Egyptian Healthcare Landscape

Given Egypt's healthcare system restructuring through the Universal Health Insurance (UHI) initiative, the implications of this research are substantial. Non-communicable diseases account for 64% of total deaths in Egypt, underscoring the urgency of effective chronic disease management [37]. Research conducted within Egypt demonstrates positive associations between PCC

quality-of-care domains—Transition of Care, Empathy, and Care Responsiveness—and patient satisfaction and loyalty [37, 38, 39]. These domains align precisely with those incorporated into the Egypt Healthcare Authority's (EHA) clinical governance frameworks. Challenges to PCC integration in Egypt include high patient demand limiting consultation duration, shortage of material and human resources, and care delivery systems still predominantly focused on disease rather than the individual [34, 39]. To advance PCC in Egyptian public hospitals, legislative changes, increased resource allocation, and extensive training programmes are required. Patient empowerment models and iterative service redesign based on patient feedback will also be central to improving the quality of care and patient experience [37, 38, 39].

4.4 Future Research Directions

Future researchers should prioritize: (1) longitudinal studies to determine the directionality and sustainability of PCC initiatives over extended periods; (2) intervention-based research, particularly randomized controlled trials, to evaluate specific PCC strategies in public hospital contexts; (3) culturally sensitive PCC model adaptations, especially for settings such as Egypt; (4) mixed-methods research to combine quantitative effectiveness data with qualitative patient and provider experiences; (5) digital health and AI integration into PCC delivery to improve accessibility and personalize care; and (6) comparative effectiveness research on transferable PCC models across diverse health system and policy environments.

5. CONCLUSION

This systematic review demonstrates a strong, consistent positive relationship between Patient-Centered Care and patient satisfaction in chronic disease management in public hospitals ($r = 0.51$, 95% CI [0.44, 0.58]). The results underscore the need for PCC in resource-constrained care systems. For PCC to be actualized, systemic barriers must be removed through policy reform, funding increases, and specialized training. The findings offer specific, actionable direction to policymakers, healthcare administrators, and practitioners globally, with particular relevance for Egypt's healthcare system undergoing UHI reform.

6. DECLARATIONS

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethical Approval: Ethical approval was not required for this systematic review as it involved the analysis of previously published and publicly available data and did not include direct human or animal subjects research.

Author Contributions: Passant A. Nassar: Conceptualization, Methodology, Data Curation, Formal Analysis, Writing – Original Draft, Visualization. Samir Y. Marzouk: Study screening and selection, resolved disagreements between primary reviewers, verified data extraction accuracy, contributed to quality appraisal of included studies, and critically revised the manuscript for important intellectual content. Mai S. Mabrouk: Supervision, Validation, Writing – Review & Editing, Project Administration.

AI Statement: Artificial intelligence (AI) tools were used solely for basic grammar correction and language refinement in the preparation of this manuscript. Specifically, Manus and Claude AI were employed to improve the readability and linguistic clarity of the English text. All scientific content, data interpretation, and conclusions were developed independently by the authors. The authors have thoroughly reviewed and edited the AI-assisted text and accept full responsibility for the content of the manuscript.

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