

Review

Barriers and facilitators to PDMP IS Success in the US: A systematic review

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ABSTRACT

Introduction: Prescription Drug Monitoring Programs (PDMP) help prevent prescription drug misuse and promote appropriate pain management. Despite these benefits and PDMP mandates in most states, PDMPs face challenges that hinder their success. This paper uses the Delone and McLean Information Success (IS) Model to review the current literature for barriers and facilitators to PDMP quality, use, intention to use and user satisfaction in the United States (U.S.).

Material and Methods: Scopus, PubMed and Embase databases were searched due to their relevance to information technology, education and research.

Results: There were 142 and 183 barriers and facilitators, respectively, found in 44 peer reviewed articles. Barriers to PDMP quality, use and user satisfaction include lack of interstate data sharing, access difficulties, lack of time, inability to delegate access, lack of knowledge or awareness of the PDMP, and lack of EHR integration. Facilitators to PDMP quality, use and user satisfaction include interstate data connections, real-time data updates, EHR integration, and access delegation.

Discussion: Interstate data sharing, EHR integration and expanding access to delegates were common themes found. Some results were found to be contradictory such as mandating use.

Conclusion: PDMP users can use these findings to assess current barriers to PDMP success in the U.S. and draw possible solutions from the list of facilitators. Practitioners should consider the context of their state and organization when determining which facilitators would most promote PDMP IS success. Combining facilitators may be the best route to PDMP IS success in certain situations.



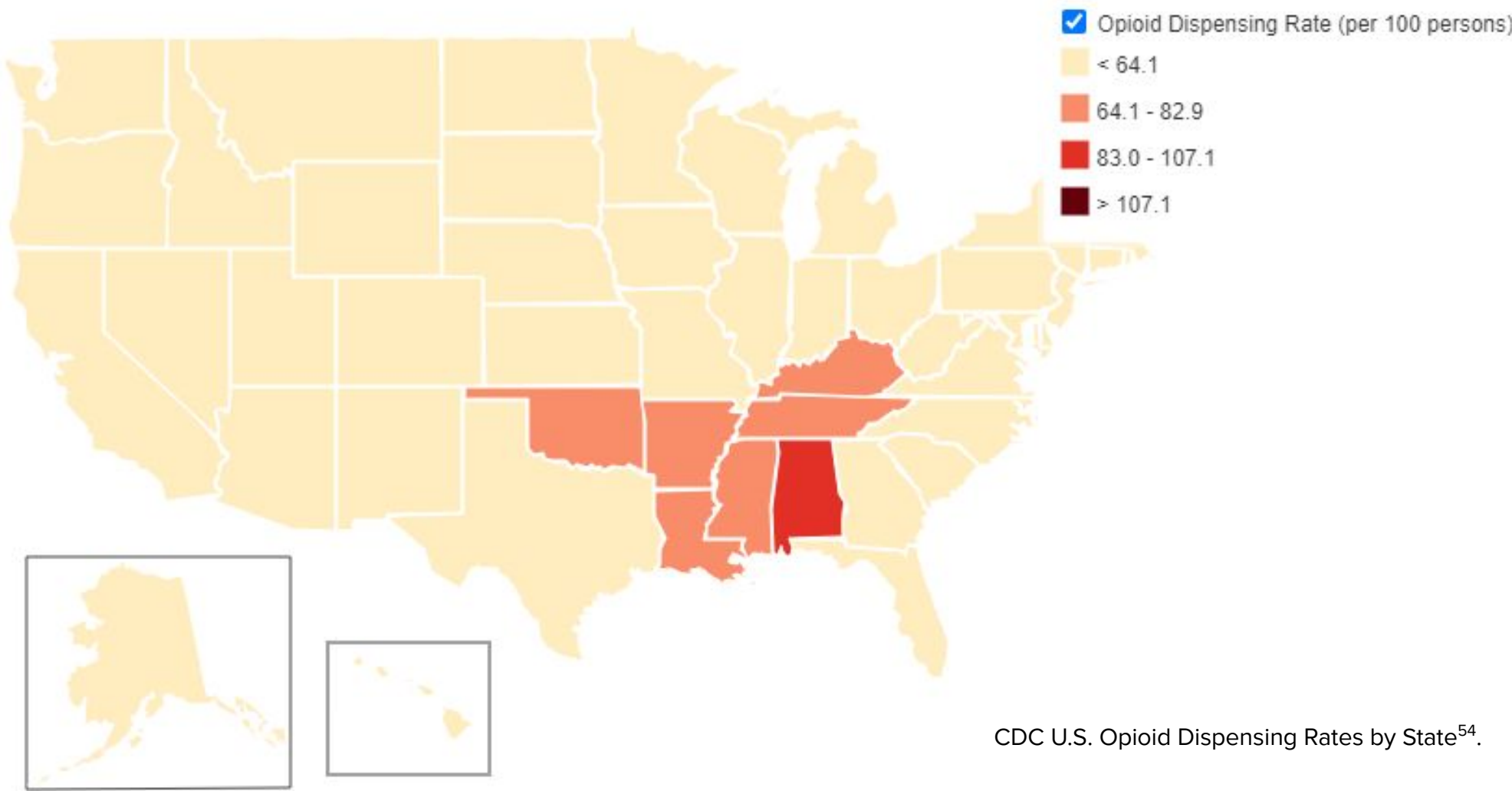
PDMP – Background

- Prescription Drug Monitoring Programs (PDMP)
 - Electronic database that tracks controlled substances prescribed/dispensed⁴⁶
 - Administered by the state
 - AL – dispensing data submitted every 24 hours for most health care organizations
 - State data sharing⁴⁷
 - 47 states
 - PMP Interconnect
 - Inter-state data access varies by state
 - State boards require PDMP review when prescribing controlled substances
 - AL - Frequency depends on MME (CDC guidelines)
 - Exceptions – hospice, long-term care facilities⁴⁸
 - Benefits/Effectiveness
 - Prevent prescription drug misuse, diversion⁴⁹, doctor shopping^{31,49}
 - Promote appropriate pain management^{50,51}

PDMP – Background

- Purpose – aid in appropriate prescribing decisions
 - Want PDMP to be used to its full potential & purpose
- Challenges to PDMP Success^{52,53}
 - Lack of time
 - Lack of registration/access issues
 - Fear of legal ramifications
 - Reporting and workflow issues

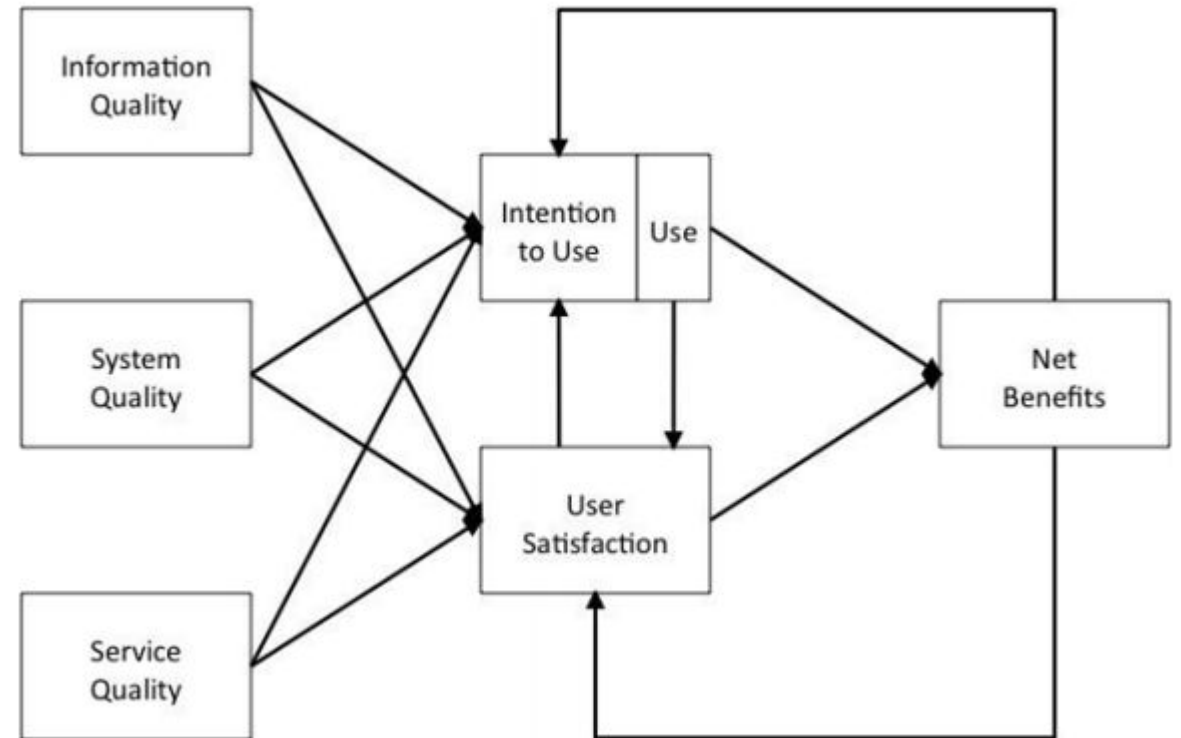
U.S. State Opioid Dispensing Rates



CDC U.S. Opioid Dispensing Rates by State⁵⁴.

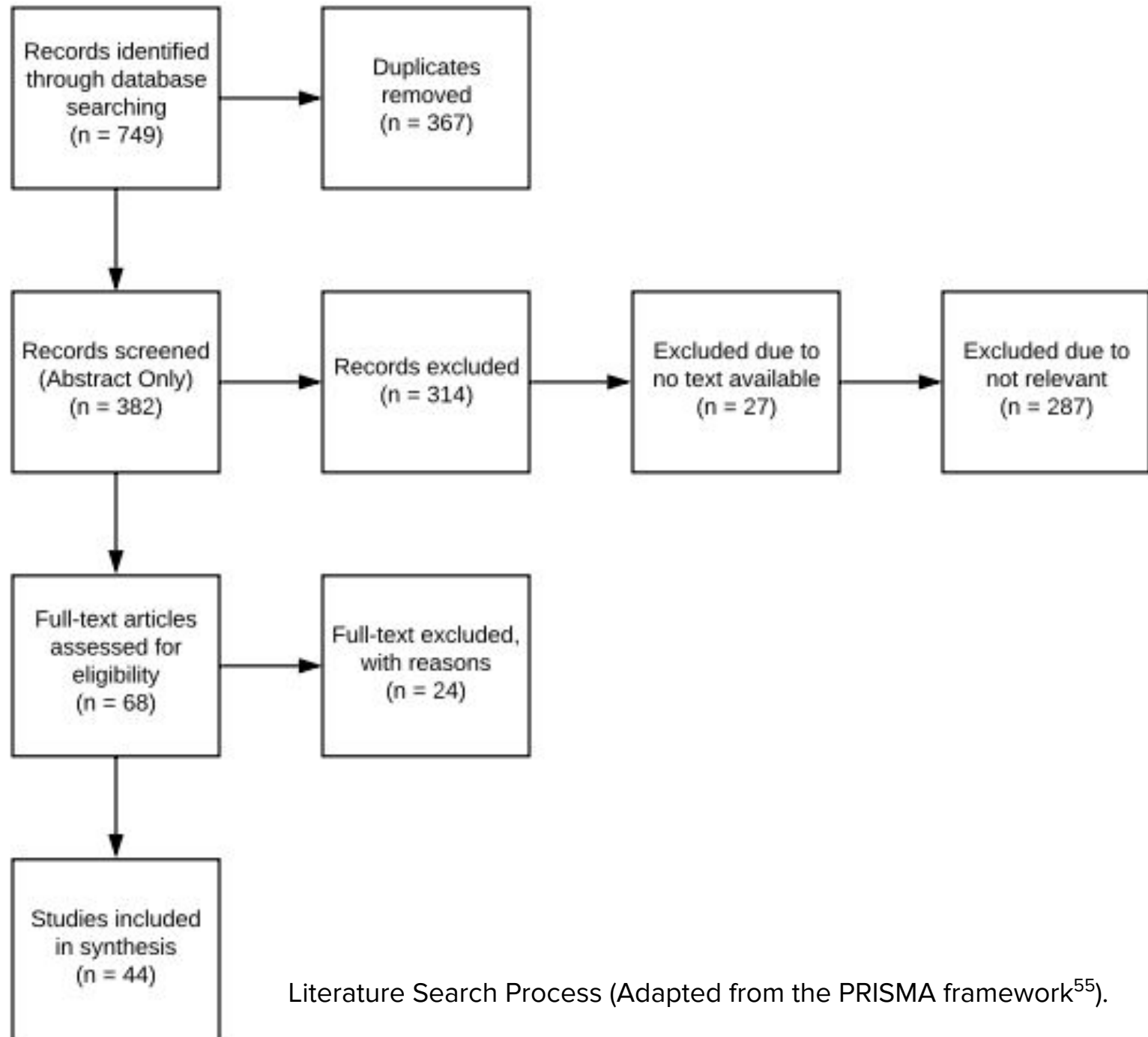
Introduction

- Purpose
 - Literature review of barriers and facilitators to PDMP information system (IS) success in the US
 - DeLone and McLean IS Success Model
 - 6 interrelated dimensions of IS success
 - Evaluate IS components that contribute to system success
 - Provide insight on what barriers exist to PDMP IS success and possible facilitators to address those barriers



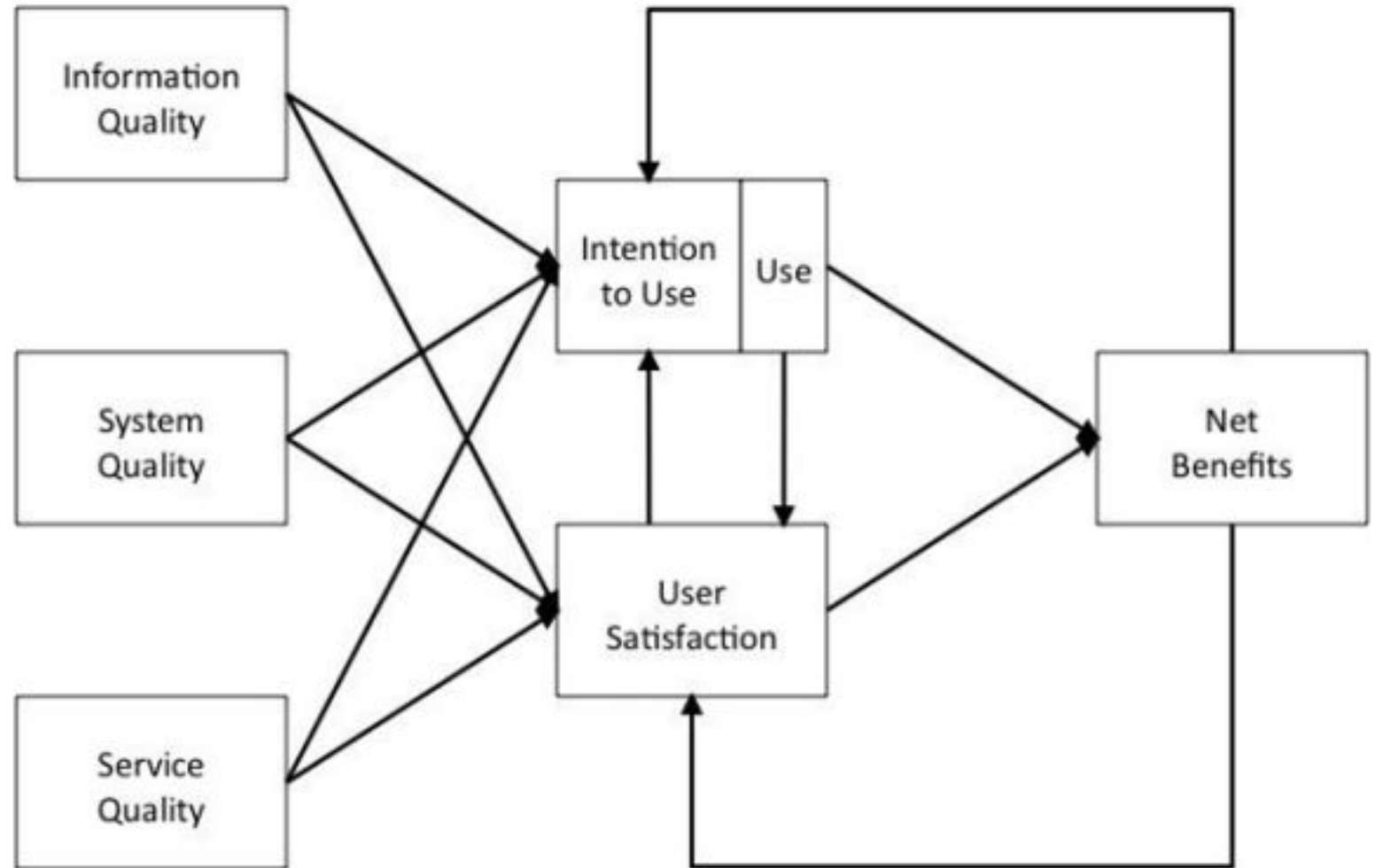
IS Success Model (Adapted⁴⁵).

Methods



Literature Search Process (Adapted from the PRISMA framework⁵⁵).

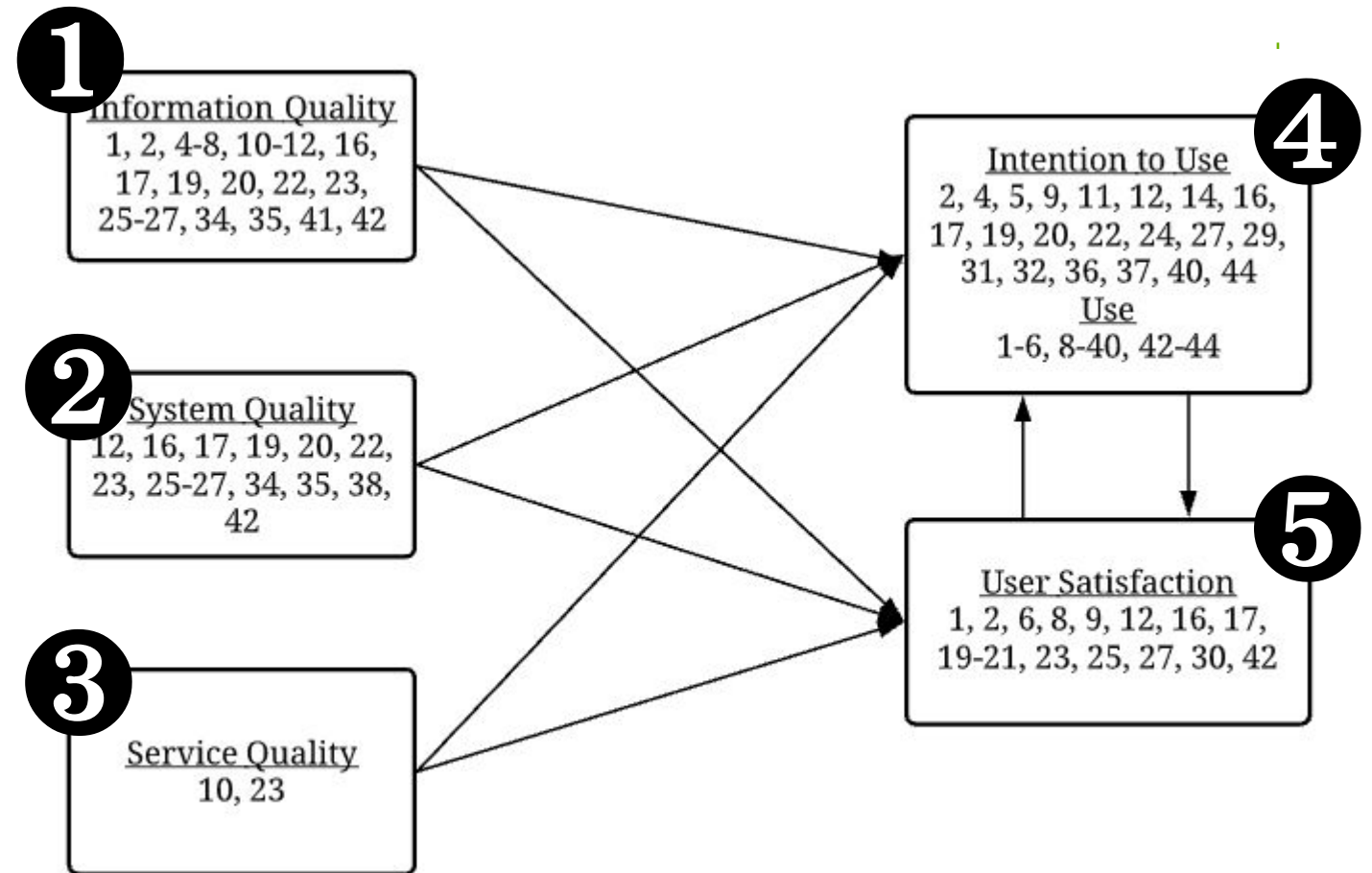
Methods



IS Success Model (Adapted⁴⁵).

Results

- **Information Quality**
 - Complete, accurate, timely data
- **System Quality**
 - System design, system ease of use, system performance
- **Service Quality**
 - System support
- **Intention to Use - Registration**
 - Access, awareness, lack of time, training, utilization
- **Use – Actual use**
 - Access, awareness, lack of time, training, utilization
- **User Satisfaction**
 - Approval, perceived usefulness



Model build out with literature attribution by factor (Adapted⁴⁵).

Results

Use was densest for both barriers AND facilitators

Table 5
Article contribution to results.

No.	Study	Barriers					Facilitators						
		IQ	SvQ	IU	U	SQ	US	IQ	SvQ	IU	U	SQ	US
1	(Carnes et al., 2017)	✓			✓	✓	✓	✓			✓	✓	✓
2	(Blum et al., 2016b)	✓		✓	✓	✓	✓			✓	✓	✓	✓
3	(McDonald et al., 2019)				✓	✓					✓	✓	✓
4	(Vander Weg et al., 2018)	✓			✓	✓				✓	✓	✓	
5	(Manasco et al., 2016)	✓			✓	✓		✓		✓	✓	✓	
6	(Sun et al., 2018)	✓			✓	✓	✓				✓	✓	
7	(Finley et al., 2017)	✓			✓							✓	
8	(Gershman et al., 2014)	✓			✓		✓				✓		✓
9	(Fleming et al., 2014)			✓	✓		✓			✓	✓		✓
10	(Haffajee et al., 2018)				✓			✓	✓		✓	✓	
11	(Hildebran et al., 2014)	✓		✓	✓	✓		✓		✓	✓	✓	
12	(Smith et al., 2015)	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓
13	(Rasubala et al., 2015)				✓						✓	✓	
14	(Ranapurwala et al., 2018)				✓					✓	✓	✓	
15	(Patrick et al., 2016)				✓						✓	✓	
16	(Perez et al., 2017)	✓		✓	✓			✓			✓	✓	✓
17	(Deyo et al., 2015b)	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓
18	(Grecu et al., 2019a)				✓						✓	✓	
19	(Rutkow et al., 2015b)			✓	✓	✓	✓	✓		✓	✓	✓	
20	(Elder et al., 2018)	✓		✓	✓	✓		✓		✓	✓	✓	✓
21	(Goodin et al., 2019)				✓						✓	✓	✓
22	(Lin et al., 2017)	✓		✓	✓	✓		✓		✓	✓	✓	✓
23	(Leichtling et al., 2019)	✓			✓	✓	✓	✓	✓		✓	✓	✓
24	(Bachhuber et al., 2018)			✓	✓					✓	✓	✓	
25	(Radomski et al., 2018b)	✓			✓	✓	✓	✓			✓	✓	✓
26	(Li et al., 2014)	✓			✓						✓	✓	
27	(McCauley et al., 2019)	✓		✓	✓		✓				✓	✓	✓
28	(Wixson et al., 2015)				✓						✓	✓	
29	(Shev et al., 2018)			✓	✓					✓	✓	✓	
30	(Fendrich et al., 2018)				✓						✓	✓	✓
31	(Bao et al., 2016)				✓					✓	✓	✓	
32	(Yarbrough, 2018)				✓						✓	✓	
33	(Ali et al., 2017)				✓					✓	✓	✓	
34	(Griggs et al., 2015)	✓			✓	✓					✓	✓	
35	(Bachhuber et al., 2016)	✓			✓						✓	✓	
36	(Maughan et al., 2015)				✓					✓	✓	✓	
37	(Pugliese et al., 2018)			✓	✓	✓				✓	✓	✓	
38	(Young et al., 2017)	✓			✓	✓					✓	✓	
39	(Ayres and Jalal, 2018a)				✓						✓	✓	
40	(Hernandez-Meier et al., 2017)			✓	✓						✓	✓	
41	(Young et al., 2018)				✓						✓	✓	
42	(Poon et al., 2016)				✓	✓	✓	✓			✓	✓	
43	(Leas et al., 2019)				✓						✓	✓	
44	(Irvine et al., 2014)			✓	✓						✓	✓	

Note: IQ = Information Quality, SvQ = Service Quality, IU = Intention to Use, U = Use, SQ = System Quality, US = User Satisfaction.

Table 4

Detailed Listing of Barriers and Facilitators to PDMP IS Success.

Main Construct	Sub-Construct	Barriers	Facilitators
Information Quality	Complete Data	Lack of Interstate Data Sharing	Increase Interstate Data Sharing
		Only Tracking Schedule II Data	Expand Number of Scheduled Drug Types in Data
		Lack of Data Standardization	Data Standardization
		Incomplete Data	Include More Detailed Data
		Data Not Available from different distributor types	Distributor Data Available Regardless of Where Dispensing Took Place
		Lack of Process Standardization	
		Data Security Concerns	
		Data Privacy Concerns	
		Deficiencies in Data Transmission	
		Lack of Historical Data	
	Accurate Data		
		Duplicate Data	Create Probabilistic Patient ID Matching Procedure Improve Record Matching Create Unique Patient Identifier
		Data Inaccuracy	Improve Data Accuracy Implement Mechanisms to Decrease Inaccurate Data
		Too Many Data Entry Points	
		Interstate Data Inaccuracy	
		Provider Data Inaccuracy	
		Distributor Data Inaccuracy	
		Data Entry Errors	
		Drug Dose Data Inaccuracy	
	Timely Data		
		Lack of Timely Data	Increase Update Frequency Real-time Data Updates Timeframe Requirements for Reporting Relative to Dispensing EHR Integration Increase Reporting Speed
		Lack of Timely PDMP Reporting	Real-time Data Updates EHR Integration combined with real-time reporting
		Lack of Timely Distributor Data	Increase Data Entry Time

Results

Literature Review - Major Takeaways

- Themes most frequently reported
 - Interstate data sharing
 - EHR-Integration
 - Delegate access
 - Mandates
- Some facilitator themes contradict each other
- Combining facilitators may yield optimal results
- Context should be assessed before determining appropriate facilitators

Limitations

- Only U.S. studies
- Excluded Net Benefits dimension
- Model only gives IS success perspective

PDMP Barriers & Facilitators – Alabama Specific

- AL specific (also suggested training areas)
 - Mitigate data submission error (dispensers)
 - Patient ID Matching
 - Physicians are responsible for maintaining accurate delegate authority (physicians)
 - Interpretation of Narx Scores (prescribers and pharmacists)
 - How to talk to patients about information found in the PDMP (prescribers and pharmacists)

PDMP Training

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Prescription Drug Monitoring Program (PDMP)

The Prescription Drug Monitoring Program (PDMP) is a program developed to promote the public health and welfare by detecting diversion, abuse, and misuse of prescription medications classified as controlled substances under the Alabama Uniform Controlled Substances Act.

Alabama's PDMP: Taking Knowledge and Skills to the Next Level

The Alabama Department of Public Health and the Auburn University Harrison School of Pharmacy present programs designed to enhance PDMP users' ability to appropriately and optimally use the PDMP in their professional environment. 5.5 hours of ACPE approved continuing education credit, 5.5 ABSWE, 6.6 ABN, ACCME and ANCC credits pending. See our [flyer](#) for details, and visit the Harrison School of Pharmacy to register. Registration opens on January 15, 2020.

WHAT CAN YOU DO TO PREVENT OPIOID MISUSE?

- PDMP registration (prescribers and delegates)
- Update your account
- Obtain patient controlled substance prescription history report
- Understand patient Narxcare report
- Multi-state patient search
- Understanding your prescriber report

Alabama Public Health Prescription Drug Monitoring Program (PDMP)⁵⁶.

PDMP Training



SEARCH

Alabama's PDMP: Drugs of Abuse, PDMP Updates, and Regulations- Recorded Webinar

Alabama's PDMP: Drugs of Abuse PDMP Updates, and Regulations ... attendees' knowledge regarding PDMP use. This seminar will enhance ... This seminar will enhance PDMP users' ability to appropriately ...

Alabama's PDMP: What You Need To Know- Recorded Webinar

Alabama's PDMP: What You Need To Know- Recorded ... attendees' knowledge regarding PDMP use. This seminar will enhance ... This seminar will enhance PDMP users' ability to appropriately ...

Alabama's Prescription Drug Monitoring Program: A Key Tool in the Fight Against Opioid Use Disorder (OUD), Dr. Brent Fox

focuses on the role of the PDMP as a tool to fight opioid ... prescribing in the country, yet PDMP use is not required for pharmacists ... required for pharmacists. PDMP use is required for prescribers ...

Auburn University Harrison School of Pharmacy⁵⁷.

PDMP EHR-Integration

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EHR Integration

The Alabama PDMP just announced that it has partnered with Appriss Health to utilize, analyze, and present information from the Alabama PDMP into the clinical workflow of all eligible prescribers and pharmacists in Alabama via Appriss Health's PMP Gateway and NarxCare platforms.

PMP Gateway integrates Alabama PDMP information, as well as NarxCare, into EHR and pharmacy management systems to empower clinicians at the point of care to quickly identify patients who may be at risk for prescription drug addiction, overdose, and death.

NarxCare equips clinicians and care teams the advanced analytics, tools, and technology they need to make better decisions about patient care. For more information on NarxCare, please visit <https://apprisshealth.com/solutions/narxcare>.

- Link to PDMP in EHR
- UAB integrated in 2019
 - Positive feedback inpatient, clinics and ED
 - Improved workflow
 - Decrease access barriers (if account is current)
- No cost to all Alabama healthcare providers via their EHR and pharmacy management system vendors and PMP Gateway⁵⁸
- However, not all EHR and pharmacy management system vendors are currently integrated. Your integration process and duration time is dependent upon your provider⁵⁸
- More info: Alabama Public Health EHR Integration⁵⁸

Conclusion

- PDMP is a tool used help make appropriate prescribing decisions
- Evidence shows PDMPs have benefits
- Since PDMPs can be viewed as a technology artifact, it made sense to apply and IS frame
- Some facilitators may need to be combined to maximize PDMP IS Success.
- Context can play a large part in deciding how to handle PDMP IS Success hurdles
- Common barriers - Suggested training topics specific to AL
- AL PDMP training resources
- PDMP EHR-Integration

Questions/Feedback

- Please contact Heather D. Martin at martinhd@uab.edu for questions or feedback

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