

Early Warning Signs in Hospital construction projects

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P5 Presentation

11/04/2024

Supervisors: Louis Lousberg & Marian Bosch-Rekvelde

Mentors AT Osborne: Jeroen Brinkman & Laurens Lancee



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Introduction

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INTRODUCTION - Dutch hospital



▲ Verbouwing van de entree van Rijnstate in Arnhem. © Rijnstate, Marina Popova, DG

Bezem gaat flink door Arnhems ziekenhuis in 'midlifecrisis': vaarwel, jaren negentig

Hoogste tijd om het jaren negentig-sausje van Rijnstate af te poetsen, vindt het Arnhemse ziekenhuis. De komende tien jaar volgt een grootscheepse renovatie. Stap één in november. De ingang, de bekende draaideur met geel hekwerk erboven, gaat dicht én komt niet meer terug.

Francine Wildenborg 13-10-23, 06:30



Maasstad Ziekenhuis gaat voor 100 miljoen euro verbouwen en innoveren

31 december 2021, 11:48 Algemeen 1.236 keer gelezen



Ruim 200 miljoen voor nieuwbouw ETZ: dit gaat er allemaal veranderen

TILBURG - Het Elisabeth-TweeSteden Ziekenhuis start na de zomer met de bouw van een nieuwe verpleegtoeren en het acuut centrum waar alle spoedeisende hulp bij elkaar zit. De traumahelicopter krijgt een nieuw platform op de toren en de aanrijroute voor ambulances wordt aanzienlijk sneller.

Hein Eikenaar 23-02-24, 06:00 Laatst update: 23-02-24, 10:39

▲ Impressie van de verpleegtoeren met helikopterplatform en daarnaast het acuut centrum waar alle spoedzorg is ondergebracht. © Impressie ETZ

INTRODUCTION - Dutch hospital construction



Alweer onderzoek naar nieuwbouw Bravis ziekenhuis: lukt het nog om in 2026 de eerste paal te slaan?

ROOSENDAAL - Gaat het nog lukken om in 2026 te starten met de nieuwbouw van het Bravis ziekenhuis langs de A58 bij Roosendaal? Dat is de grote vraag nu de Raad van State nieuw onafhankelijk onderzoek heeft gelast.

Franka van der Rijt 02-10-23, 07:01

'Elke maand uitstel van nieuwbouw ziekenhuis Doetinchem kost 7 ton'

UPDATE DOETINCHEM - Als de nieuwbouw van het Slingeland-ziekenhuis aan de A18 in Doetinchem moet worden uitgesteld, kost dat 7 ton per maand. Dat heeft Chrit van Ewijk, voorzitter van de raad van bestuur, de burgemeesters en wethouders van gemeenten in Oost-Achterhoek vorige week laten weten.

Tanja Kits 10-12-19, 14:45 Laatste update: 10-12-19, 20:06 Bron: De Gelderlander



Slingeland moet nieuwe vergunning aanvragen voor bouw ziekenhuis aan A18

DOETINCHEM - Het Slingeland Ziekenhuis in Doetinchem moet een nieuwe vergunning aanvragen voor de bouw van het nieuwe ziekenhuis aan de A18. Het Slingeland wil nog altijd volgens plan in 2026 open.

Henny Haggeman 22-01-22, 07:13

Dutch hospital construction projects

- Need for renovation and new buildings
- Need for flexibility & adaptability
- Increasing complexity
- Complex organisational structure
- Changed regulations in 2008
- Missed project goals

Early Warning Signs

Projects do not fail in one day

Traditional project management tools (planning, budget, risk register) are not enough

Early Warning Signs (EWS)

- Process-related
- Gut-feeling
- Leading indicators

“An early warning is an observation, a signal, a message (...) that is or can be seen as an expression, an indication, a proof, or a sign of the existence of some future or incipient negative issue. It is a signal, omen, or indication of future developments.”

Nikander (2002, pg 49)

Research gap

- Little to no research on EWS in hospital construction projects
- Term EWS used in different sectors
- Research is focused on other sectors, mainly infrastructure projects
- Project failure often linked to hard side of project management

Research goal

- Explore which EWS occur in hospital construction projects
- Explore which barriers occur while acting on these EWS
- Gain insight in how the barriers can be minimised
- Expand knowledge and awareness



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METHODOLOGY - Research question

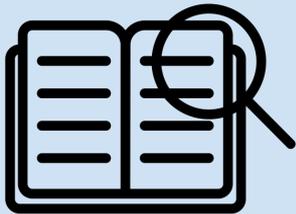
“Which Early Warning Signs can be identified in Dutch hospital construction projects, and how can acting on Early Warning Signs be stimulated to mitigate possible problems?”

METHODOLOGY - Sub-questions

1. What are Early Warning Signs and how can they be identified?
2. What barriers occur while acting on EWS and how can these barriers be minimised?
3. Which EWS and which barriers occur while acting on EWS in hospital construction projects?
4. How can the barriers in hospital construction projects be minimised?

METHODOLOGY - Sub-questions

1. What are Early Warning Signs and how can they be identified?
2. What barriers occur while acting on EWS and how can these barriers be minimised?
3. Which EWS and which barriers occur while acting on EWS in hospital construction projects?
4. How can the barriers in hospital construction projects be minimised?



Literature review

METHODOLOGY - Sub-questions

1. What are Early Warning Signs and how can they be identified?
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Literature review



Case Study

METHODOLOGY - Sub-questions

1. What are Early Warning Signs and how can they be identified?
2. What barriers occur while acting on EWS and how can these barriers be minimised?
3. Which EWS and which barriers occur while acting on EWS in hospital construction projects?
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Literature review



Case Study



Expert Panel

METHODOLOGY - Qualitative & exploratory study

THEORETICAL STUDY



Literature review

EWS
from literature

Barriers
from literature

Minimising barriers
from literature

EMPIRICAL STUDY



Case Study

EWS categories
from practice

Barriers
from literature

Minimising barriers
from literature



Expert Panel

EWS categories
evaluated from practice

Barriers
evaluated from practice

Minimising barriers
from practice

CONCLUSION



EWS in hospital construction projects

Barriers in hospital construction projects

Minimising Barriers in hospital construction projects

METHODOLOGY - Case Study

Goal

Which EWS occur in a hospital (re)construction project, and how barriers interfere in responding to these EWS

Case

- Complex hospital (re)construction project
- Located in the Netherlands
- Building phase
- Confidentiality and anonymity

Semi-structured interviews

Eight interviews with different project members



Case Study

METHODOLOGY - Expert Panel

Goal

- Evaluate EWS and barriers from literature study and case study, and finding possible solutions to minimise the barriers

Two hour Expert session

Eight experts with extensive knowledge & vast experience



Expert Panel



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Literature review



Case Study



Expert Panel



Conclusion

Early Warning Signs



Taking EWS into account, and responding to them can have a positive effect on the process construction projects.

- Leading indicators, soft signals, grow stronger
- Gut feeling
- Identification of EWS mostly focuses on hard signals

Seven categories of EWS

Nikander & Eloranta (2001), Williams et al. (2012)

Larsen et al. (2022), AT Osborne (2021)

EWS categories
literature review
Feasibility project goal
Quality of documents
Experience in team
Management
Workload
Communication
Stakeholders

Barriers



- Difficult to identify and act on EWS
- No literature on hospital construction projects

Eight barriers that prevent responding on EWS

From infrastructure construction projects (Wijtenburg, 2018)

Barriers
literature review
Optimism Bias
Client - Contractor relation
Uncertainty avoidance
Time pressure
Fragmentation
Management style
Project complexity
Effects of politics

Minimising barriers



- No clear means or method
- Several suggestions

Klakegg et al., 2010; Flyvbjerg, 2013;
Pinto, 2014; Wijtenburg, 2018

Minimising Barriers <i>(Literature study)</i>
- Outside view on project (by internal and external reviews)
- Transparent communication - Project organisation should lead by example
- Tracking soft EWS explicitly - Discussing EWS on regular basis
- Secure transparency in decision making - Ensuring sufficient time for reflection
- Facilitate sharing information both inside and outside the project
- Apply bottom-up management style - Organise critical thinking and capacity
- Stimulate interactions throughout the project to reveal unknowns
- Ensuring accountability and communication to higher management and politics



Literature review



Case Study



Expert Panel



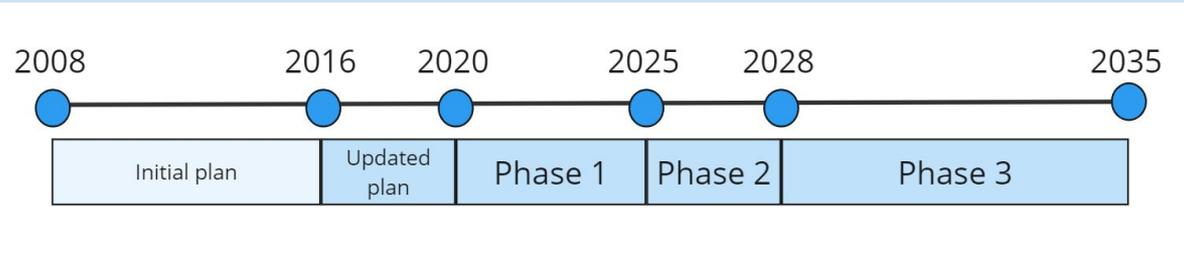
Conclusion



Case: Hospital reconstruction project

Combination of renovation and new developments

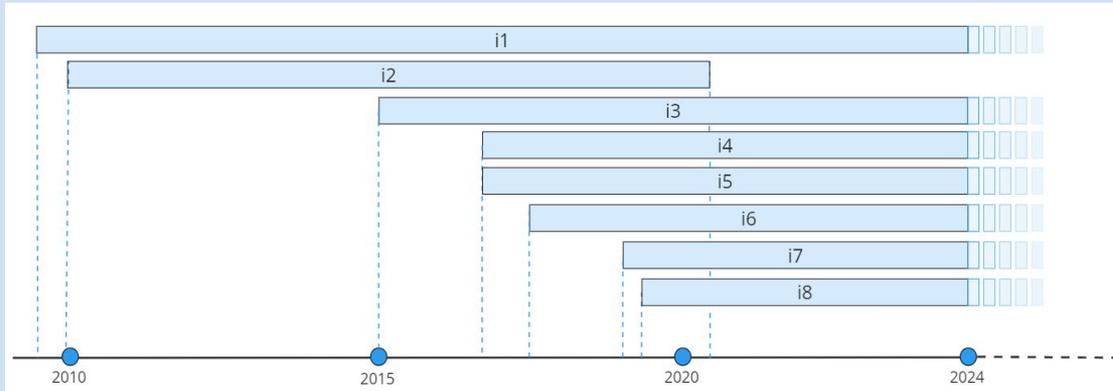
Currently in phase 1: building phase





Case: Hospital reconstruction project

Eight interviews with different (former) team members



Participants	Role
Interviewee 1 (i1)	Risk manager
Interviewee 2 (i2)	Support Building manager and stakeholder manager
Interviewee 3 (i3)	Procurement coordinator
Interviewee 4 (i4)	Real estate advisor
Interviewee 5 (i5)	Construction supervisor
Interviewee 6 (i6)	Facility Manager
Interviewee 7 (i7)	Project manager
Interviewee 8 (i8)	Project director



RESEARCH OUTPUT - Case Study

EWS

- Term not recognised by all participants
- Identified in all phases



“A feature of a hospital construction project is the high number of stakeholders, for example the nurses, doctors and managers.”

EWS categories	Named in interviews
Stakeholders	8/8 interviews
Workload	8/8 interviews
Feasibility project goal	7/8 interviews
Quality of documents	7/8 interviews
Experience in team	6/8 interviews
Management	5/8 interviews
Communication	4/8 interviews



RESEARCH OUTPUT - Case Study

EWS identified

- 12/21 soft signals
- 9/21 hard signals

Soft EWS initial plan:
Connection between hospital
construction project and internal
organisation is lacking

Hard EWS initial plan:
Project plan is not accepted by
internal stakeholders (users)



RESEARCH OUTPUT - Case Study

EWS

Highlighted:

- Postponing decision making
- Importance of Internal Stakeholders

“By postponing making a decision about the layout of the operating room, the contractor already placed the beams. When finally a decision was made, the final layout cannot be realised in the room without making changes in the structure or design.”



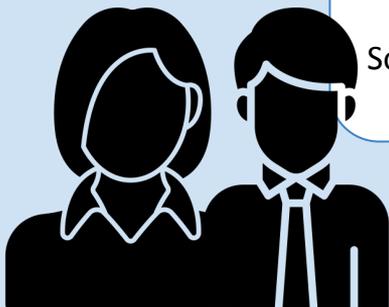


RESEARCH OUTPUT - Case Study

Barriers

- Difficulty of recognising
- All barriers recognised in all phases

“A barrier to not respond to an EWS is that team members don’t want to be in each other’s way. Due to high time pressure discussing issues is postponed or simply do not take place. [...] A hospital is a big and complex organisation. Some issues are not discussed with the persons who need to hear about the issues.”



Barriers	Named in interviews
Time pressure	5/8 interviews
Client - Contractor relation	4/8 interviews
Fragmentation	4/8 interviews
Project complexity	4/8 interviews
Optimism Bias	3/8 interviews
Management style	3/8 interviews
Effects of politics	3/8 interviews
Uncertainty avoidance	2/8 interviews



Literature review



Case Study



Expert Panel



Conclusion

Expert Panel - EWS



All EWS recognised

Two new additions:

- Team composition
- Cooperation

“A team needs a mix of experienced people and people who have a fresh attitude and look at a project not hindered by previous experiences. The importance in team composition is that attention is paid to appoint different characters in the team so that they complement each other.”



EWS categories	Recognised by experts
Decision making	8/8 experts
Feasibility project goal	7/8 experts
Quality of documents	7/8 experts
Workload	7/8 experts
Internal stakeholders	7/8 experts
Communication	6/8 experts
Experience in team	6/8 experts
External stakeholders	5/8 experts
Team Composition	Recommended by expert
Cooperation	Recommended by expert

Expert Panel - EWS



Ranked on impact on a hospital construction project

“Not acting on EWS ‘feasibility of the project goal’, ‘decision making’, and ‘experience in team’ cause immediate problems in the hospital construction project”



EWS categories ranked on impact
1 has the highest impact, 8 the lowest

1. Feasibility project goal
2. Decision making
3. Experience in team
4. Communication
5. Quality of documents
6. Internal stakeholders
7. Workload
8. External stakeholders

Expert Panel - Barriers



All barriers recognised

Specific for hospital construction projects:

- Retaining good relation with contractors
- Effects of board / politics
- Lack of time for reflection



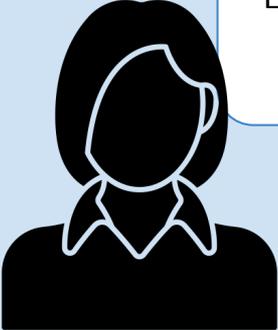
“Time pressure is sometimes needed to achieve deadlines and helps to get focus in the team. However, when there is no time available for reflecting on important issues or paying attention to gut feelings of team members, you miss important signals.”

Barriers	Recognised by experts
Management style	8/8 experts
Client - Contractor relation	7/8 experts
Optimism Bias	6/8 experts
Time pressure	6/8 experts
Uncertainty avoidance	5/8 experts
Project complexity	5/8 experts
Effects of politics	5/8 experts
Fragmentation	4/8 experts

Expert Panel - Barriers



Ranked on impact on a hospital construction project



“Each project is unique and needs a management style which fits the project goal”

Barriers ranked on impact	
<i>1 has the highest impact, 8 the lowest</i>	
1.	Management style
2.	Uncertainty avoidance
3.	Effects of Politics
4.	Optimism Bias
5.	Time Pressure
6.	Project complexity
7.	Client - Contractor relation
8.	Fragmentation

Expert Panel - Minimising barriers



Top 3 most impactful barriers

- Safe ambiance
- Informal interactions
- Reflect on regular basis
- Transparency
- Create mutual agreements
- Documentation

		Management style	Uncertainty avoidance	Effects of board/politics
Proactive	Hard	Training/Coaching for PM	Propose solutions related to planning and budget	Setting frameworks
		Create cooperation document including shared expectations	Create mutual agreements	Show alternatives of changed requirements linked to now vs later and best vs good
			Create escalation protocol	Create escalation protocol
				Present dilemmas and consequences instead of saying no
	Soft	Characters in the team	Focus on EWS	Stimulate informal meetings
		Create safe ambiance team	Create safe ambiance team	Accept friction, keep discussing, and keep in mind what is best for the project
		One on one meetings	One on one meetings	Stimulate interactions
		Stimulate informal meetings	Understand different interests	
Reactive	Hard	Organise risk management sessions	Organise risk management sessions	Show influence of EWS on project outlines: Money, Quality, Time
		Introduce a contract manager, risk manager, and a "vice-project manager"	Introduce contract management	Clarify consequences and who is responsible
		Escalate to higher management	Execute Review or Audit	
		Change PM		
	Soft	Reflect on regular basis	Reflect on regular basis	Create clarity why pressure is increased
		Discuss Management Style	Organise Team evaluations	Stimulate transparency
			Stimulate transparency	

Expert Panel - Minimising barriers



- Proactive and reactive
- Hard and Soft approach

“It is interesting that a hard signal sometimes needs a soft approach. A review or audit is a hard [management] instrument, but needs a soft launch as trust and safety are important for the team members. And sometimes it is the other way around, where a soft signals needs hard action.”





Introduction

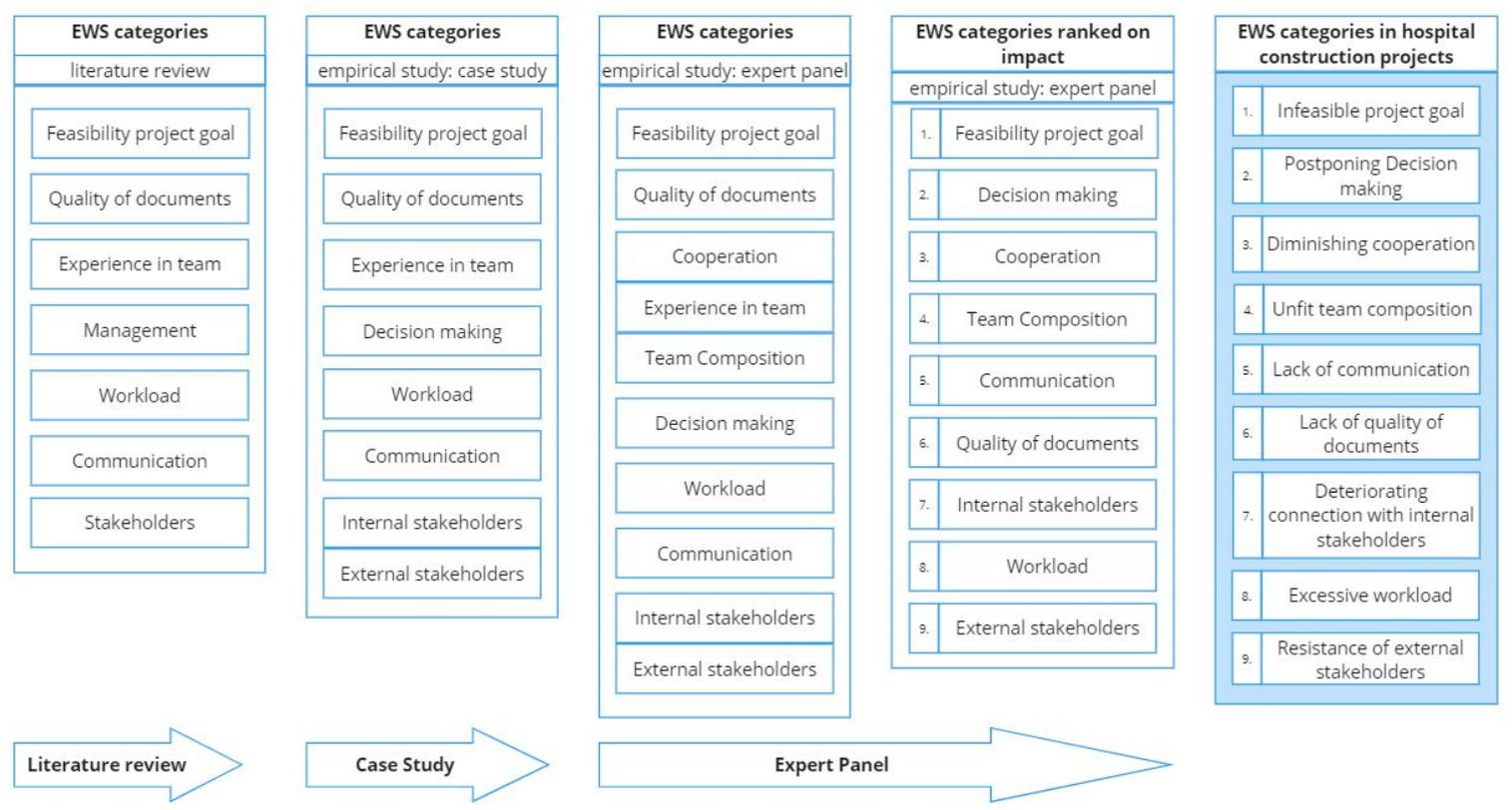
Methodology

Research Findings

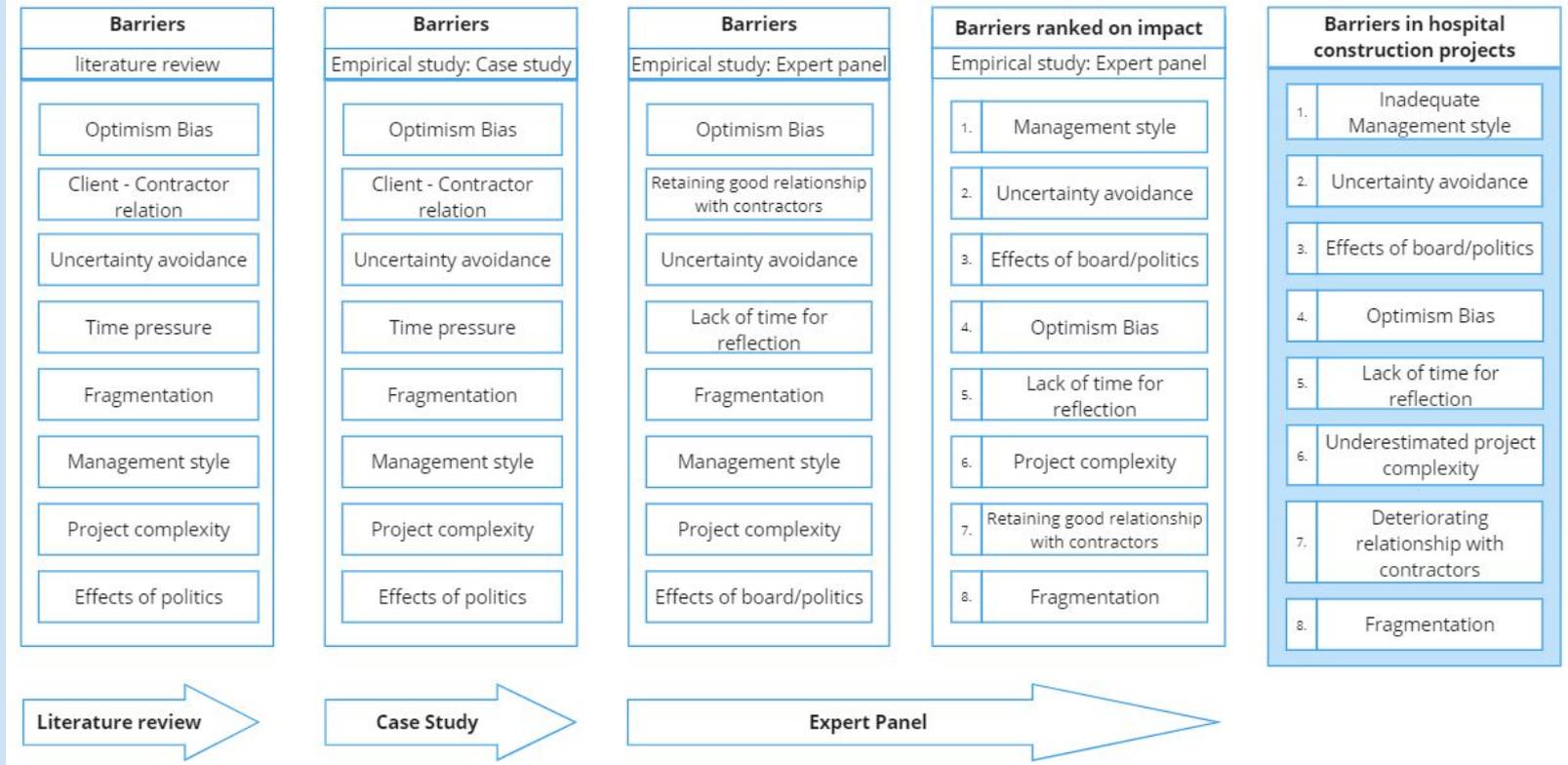
**Discussion &
Conclusion**

Recommendations

DISCUSSION - negative EWS



DISCUSSION - negative barriers



CONCLUSION



Literature review



Case Study



Expert Panel



Conclusion

CONCLUSION

Nine Early Warning Signs can be identified in Dutch hospital construction projects.

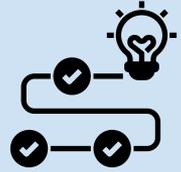
Eight Barriers that can prevent acting on EWS are found in Dutch hospital construction projects

EWS categories in hospital construction projects

1. Infeasible project goal
2. Postponing Decision making
3. Diminishing cooperation
4. Unfit team composition
5. Lack of communication
6. Lack of quality of documents
7. Deteriorating connection with internal stakeholders
8. Excessive workload
9. Resistance of external stakeholders

Barriers in hospital construction projects

1. Inadequate Management style
2. Uncertainty avoidance
3. Effects of board/politics
4. Optimism Bias
5. Lack of time for reflection
6. Underestimated project complexity
7. Deteriorating relationship with contractors
8. Fragmentation



CONCLUSION

Acting on EWS can be stimulated by minimising possible barriers:

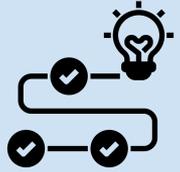
Proactive & Reactive approaches

Hard & soft aspects of project management

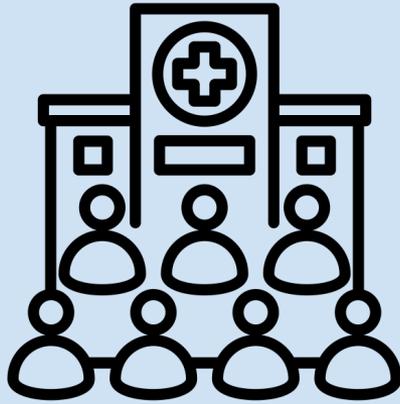
Possible solutions minimising barriers				
Proactive	Hard	In early phase of the project: create documents (escalation protocol, cooperation document, mutual agreements, and set frameworks)		
		Invest in training/coaching for PM		
		Discuss solutions or alternatives in changing environment related to time and cost		
	Soft	Know the characters in the team and be clear about the division in roles		
		Create safe ambiance in team with open communication		
		Stimulate communication in informal meetings and one on one meetings		
		Focus on EWS and stimulate responding		
		Understand different interests of all stakeholders		
		Reactive	Hard	Organise risk management sessions focussing on EWS
				Introduce a contract manager, risk manager, and a "vice-project manager"
Escalate to higher management				
Show influence of EWS on project outlines: Cost, Scope, Time				
Execute Review or Audit on a regular base				
Soft	Reflect on regular base			
	Stimulate transparency			
	Organise Team evaluations			



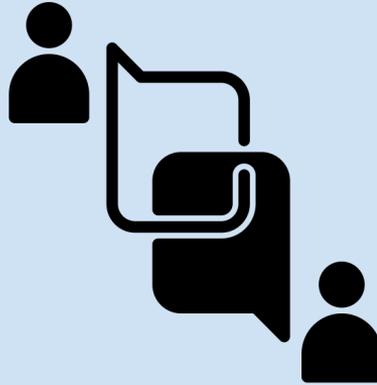
CONCLUSION



Creating awareness and focussing on EWS and minimising barriers can help improve project management in hospital construction projects



Focus on people centered aspects



Stimulate open communication



Improve cooperation between team members



Introduction

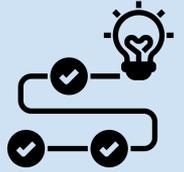
Methodology

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RECOMMENDATIONS



Future research:

- More in-depth research on EWS and barriers
- Additional research on academic hospital (re)construction projects
- Effect of EWS and barriers on final project outcome

RECOMMENDATIONS



Hospital sector and case:

- Pay special attention to influence of internal stakeholders
- Incorporate EWS in daily practice: Reflection and team building
 - Special attention for soft signals in risk sessions
- Proactive approach in early phase of project: documentation
 - Renew cooperation documents in project start- and follow-ups
- Celebrate intermediate milestones in project team
- Pay attention to team composition and character traits of the team
- Assign contract manager, risk manager, and 'vice-project manager' (NL: MPB)
- Invest in training and coaching Project Manager

“Je gaat het pas zien als je het door hebt”

JC Cruijff

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