

INTERVENÇÃO COM UM SISTEMA DIGITALIZADO DE ASSENTO E ENCOSTO PARA CADEIRA DE RODAS COM ADOLESCENTES COM PARALISIA CEREBRAL GRAVE: ESTUDO DE DOIS CASOS*

Intervention with a digitalized seat and backrest system for a wheelchair with adolescent's serious cerebral palsy: study of two cases

Intervención con un sistema digitalizado de asiento y respaldo para sillas de ruedas con adolescentes con parálisis cerebral grave: estudio de dos casos

Resumo

Introdução: A cadeira de rodas é um equipamento assistivo que contribui para que indivíduos com mobilidade reduzida possam compensar as suas limitações físicas e aumentar a independência e autonomia na vida diária. **Objetivo:** descrever a intervenção envolvendo um sistema digitalizado de assento e encosto de cadeira de rodas com dois adolescentes com paralisia cerebral grave e reportar a percepção dos cuidadores quanto à utilização deste sistema. **Método:** estudo descritivo de dois casos, com abordagem qualitativa. A utilização do sistema digitalizado deu-se a partir das etapas de avaliação, modelagem, digitalização da superfície modelada, usinagem, entrega do produto final e acompanhamento por seis semanas. Instrumentos para caracterização do sistema postural antes e após sua utilização foram aplicados, bem como um roteiro de entrevista semiestruturada a fim de avaliar a percepção dos cuidadores quanto ao processo de intervenção. **Resultados:** os sistemas posturais foram prescritos por profissionais treinados, sendo que as principais dimensões das cadeiras de rodas foram modificadas, bem como acessórios como apoio de tronco, cintos e mesa para cadeira de rodas foram inseridos. Os cuidadores consideraram a cadeira de rodas como um equipamento que auxilia no desempenho ocupacional e participação dos adolescentes. Entretanto, apresentaram dificuldades relacionadas ao manuseio e estrutura física da cadeira de rodas. **Conclusão:** A intervenção apresentou benefícios para os adolescentes e seus cuidadores. Dificuldades para a realização de atividades diárias com os recursos foram apontadas, ressaltando a importância do acompanhamento profissional e da prática centrada no cliente com o objetivo de atender às suas demandas e necessidades.

Palavras-chave: Equipamentos de autoajuda, tecnologia assistiva, cadeiras de rodas, terapia ocupacional, prescrições.

Abstract

Introduction: Wheelchair is an assistive equipment that helps individuals with reduced mobility to compensate their physical limitations and increase their independence and autonomy in daily life. **Objective:** To describe the intervention involving a digitized wheelchair seat and backrest system with two adolescents with severe cerebral palsy and to report the caregivers' perception regarding the use of this system. **Method:** a descriptive study of two cases, with qualitative approach. The use of the digitized system was based on the evaluation, modeling, digitization of the modeled surface, machining, delivery of the final product and follow-up of six weeks. Instruments for characterization of the postural system before and after its use were applied, as well as a semi-structured interview script to assess the caregivers' perception of the intervention process. **Results:** Postural systems were prescribed by trained professionals, and the main dimensions of the wheelchair were modified, as well as accessories such as trunk support, seat belts and wheelchair table. The caregivers considered the wheelchair as equipment that assists in the occupational performance and participation of their adolescents. However, they presented difficulties related to the handling and physical structure of the wheelchair. **Conclusion:** The intervention had benefits for adolescents and their caregivers. Difficulties in performing daily activities with resources were pointed out, emphasizing the importance of professional monitoring and client-centered practice with the goal on their needs and demands.

Key words: Self-Help Devices, Assistive Technology, Wheelchairs, Occupational Therapy, Prescriptions.

Resumen

Introducción: la silla de ruedas es un equipo de asistencia que ayuda a las personas con movilidad reducida a compensar sus limitaciones físicas y aumentar la independencia y autonomía en la vida diaria. **Objetivo:** Describir la intervención que involucra un sistema digitalizado de asiento y respaldo de silla de ruedas con dos adolescentes con parálisis cerebral severa e informar la percepción de los cuidadores sobre el uso de este sistema. **Método:** estudio descriptivo de dos casos, con abordaje cualitativo. El uso del sistema digitalizado se basó en la evaluación, el modelado, la digitalización de la superficie modelada, el mecanizado, la entrega del producto final y el seguimiento de seis semanas. Se aplicaron instrumentos para la caracterización del sistema postural antes y después de su uso, así como un guión de entrevista semiestructurado para evaluar la percepción del proceso de intervención por parte de los cuidadores. **Resultados / Discusión:** Profesionales capacitados prescribieron los sistemas posturales, y se modificaron las dimensiones principales de la silla de ruedas, así como accesorios como soporte del maletero, cinturones de seguridad y mesa para sillas de ruedas. Los cuidadores consideraron la silla de ruedas como un equipo que ayuda en el desempeño ocupacional y la participación de los adolescentes. Sin embargo, presentaron dificultades relacionadas con el manejo y la estructura física de la silla de ruedas. **Conclusión:** la intervención tuvo beneficios para los adolescentes y sus cuidadores. Se destacaron las dificultades para realizar actividades diarias con recursos, destacando la importancia del monitoreo profesional y la práctica centrada en el cliente.

Palabras clave: Equipo de autoayuda, sillas de ruedas, terapia ocupacional, recetas.

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1 INTRODUÇÃO

A tecnologia assistiva (TA) diz respeito a qualquer item, equipamento ou sistema de produtos comercializados (modificado ou personalizado) utilizados para aumentar, manter ou melhorar a funcionalidade de indivíduos com deficiência¹ e, de acordo com a CIF², é caracterizada dentro dos fatores ambientais, os quais incluem, dentre outros, produtos e tecnologias para a facilitação da mobilidade e transporte pessoal. Uma tecnologia apenas se tornará um facilitador para a funcionalidade quando permitir que pessoas com deficiência desempenhem suas atividades e participem em situações da vida real^{3,4}. A TA é amplamente utilizada para promover a funcionalidade de pessoas com algum tipo de deficiência, no entanto, o impacto destas intervenções carece de evidências empíricas específicas convincentes⁵.

A cadeira de rodas é um dos equipamentos assistivos que contribui para que indivíduos com mobilidade reduzida possam compensar as suas limitações físicas e aumentar a independência e autonomia na vida diária^{6,7}. Quando esse tipo de recurso é prescrito, tem-se uma série de produtos como sistemas de assento e encosto diferenciados, acessórios e almofadas, para favorecer uma boa postura sentada com o objetivo de que a pessoa seja capaz de desempenhar as suas atividades da vida diária (AVD), tais como: se alimentar, se comunicar, socializar e aprender⁸.

O sistema digitalizado de assento e encosto de cadeira de rodas (Figura 1) é um sistema composto por almofadas de encosto e assento os quais utilizam um sistema de vácuo para modelagem, oferecendo uma superfície firme, uniforme e confortável para as partes do corpo apoiadas. Por ser modelado no corpo da pessoa, esse tipo de modelagem é capaz de produzir um encosto e assento personalizado considerando as características singulares de cada indivíduo. Conta com um simulador capaz de produzir mudanças relacionadas ao *tilt*, *recline* e superfícies de apoio. Esse tipo de tecnologia possui indicações para problemas de: escoliose, hiper cifose, hiperlordose, e para sequelas de doenças como paralisia cerebral (PC), mielomeningocele, amiotrofia espinhal e distrofia muscular⁹.

Figura 1. Sistema digitalizado de assento e encosto de cadeira de rodas.

Fonte: Pesquisa de Campo, 2017



(VVH VLVWHPD WHP FRPR SULQFLSDO REMHWLYR FRUULJLU DOWHU
SRVVtYHLV GHIRUPLGDGHV PXVFXORHVVTXHOpWLFDDV SUHVHQWHV SURSR
FRQIRUWRVXRULRFDGHHLUD GH URGDV \$ XWLOL]DomR GHVWH VLVWHPD H
omR FOtQLFD FRPSRVWD SRU

&RPSRQHQWH SRVWXUDO FRPSUHHQVmR GH FRPR R VXMHLWR VH P
WDGD H LGHQWLILFDomR GDV SRVVtYHLV FRPSHQGLDQWVLIUFDORJVDGDWRU
TXH LQIOXHQFLDP QD SRVWXUD WDLV FRPR GHVHTXLOtEULR PXVFXODU
ODU UHIOH[RV SDWROyJLFRV DOWHUDo}HV RUWRSpGLFDV H KDELOLGD

&RPSRQHQWH QHXUROyJLFR YHULILFDomR GRV VLQDLV GH HWLRO
HQFLDP QDV KDELOLGDGHV IXQFLRQDLV GD SHVVRD H[FRQWUROH FHU
ORFRPRomR HTXLOtEULR DOFDQFH SUHHQVmR W{QXV PXVFXODU PRY
FRQGLo}HV GD SHOH VHQVLELOLGDGH FSDDFLGDGH FRJQLWLYD H GH F

&RPSRQHQWH RUWRSpGLFR LGHQWLILFDomR GH SRVVtYHLV DOWHU
ORHVVTXHOpWLFRTXH SRVVDP LQIOXHQFLDU QD PDQXWHQomR GD SRVWX
VHJPHQWRV FRUSRUDLV LQYHVWLJDGRV VmR D SHOYH H D FROXQD YHU
LGHQWLILFDU OX[D]o}HV VXEOX[D]o}HV KLSHUFLIRVH KLSHUORUGRVH H

\$V SULQFLSDLV YDQWDJHQV GR XVR GHVWH VLVWHPD HVWmR UHOD
iUHD GH FRQDWR HQWUH R FRUSR GD SHVVRD H D VXSHUITFLH D SHUV
DFRUGR FRP D DQDWRPLD LQGLYLGXDO H D SRVLELOLGDGH GR DUPD]H
GDGRV VHP SHUGDV VH LQIRUPDomR SHUPLWLQGR TXH XPD FySLD LGrQ
FRVWR VHMD UHSURGX]LGD SRVWHULRUPHQWH

\$ LQGLFDomR GHVWH VLVWHPD SDUD FULDQoDV H DGROHVFHQWHV
IDWR GH TXH HVWHV VXMHLWRV DSUHVHQWDP LQFSDDFLGDGH GH JHUDU
XPD SRVWXUD DQWLJUDYLWDFLRQDO H FRQVHTXHQWHPHQWH SDVDP
WDGD D TXDO p SUHMxGLFDGD GHYLGR j H[LVWRQFLD GH DOWHUDo}HV
GDGH KLSRWRQLD GLVWRQLD DWD[LD OHYDQGR HP ORQJR SUD]R DR
GHV PXVFXORHVVTXHOpWLFDDV

2 REMHWLYR SULPiULR GH LQWHUYHQom-RVQD UHDFLOLMDomR RRPGLUH
[LPR JUDX GH IXQomR TXDQGR VHQWDGRV SDUWLFXODUHQWH GRV PHF
SRVWXUD VHQWDGD FRQIRUWiYHO TXH RIHUHoD SRWHQFLDO DR VXMHLW
PHQWH VH FDUDFWHUL]D FRPR XP UHVXOWDGR HWLWXGSDUHQWLIUDYGRSRU
)HUQDQGDDO HWULILFRX TXH R XVR WDUGLR GH VLVWHPDV GH DGHTXDor
oDV FRP 3& GH LGDGH VXSHULRU D DQRV p XP IDWRU TXH LQIOXHQFLD
PHQWR GH GHIRUPLGDGHV TXH LPSHGHP D IXQomR

\$V FDGHLUDV GH URGDV PDQXDLV FRQYHQFLRQDLV JHUDOPHQWH V
PDV SRVWXUDLV IDFLOPHQWH GREUiYHLV RV TXDLV QD PDLRULD GDV Y
ODWHUDO VXILFLHQWH SDUD LPSHGLU JHUHQFLDU RX FRUULJLU SUREO
FR \$OpP GLVVR PHVP RV LGHWFDGHHLUDV GH URGDV VRILVWLFDDV GLIL

SRVVLELOLGDGH GH DMXVWHV jV GHIRBPLHGDGHFRVLQVWRDSDRGDYH]HV WDL
WHPDV VmR VXEVWLWXtGRV SRU RXWURV WLSRV FRPR DTXHOHV SURGX]
WDOLJDGR(VVXD PDLRULD DV FDGHLUDV GH URGDV SUHVFULWDV SDUD S
SRVWXUDLV VLJQLILFDWLYDV VmR PRQWDGDVDFSDURWLURGHHPQmRBY SU
UDQWH TXH HVVHV VLVWHPDV GH IDWR DWHQGDP jV QHFHVVLGDGHV LQQ

\$ GLJLWDOL]DomR GH VXSHUIFLHV SDUD D IDEULFDomR GH FRPSRQ
PD GLVFXWLGR QD OLWHUDVHUXUDX3DQFRWWHFR\$PSVUDRULP WURV HQ
FRVWRV GLIHUHQWHV GH FDGHLUDV GH URGDV HP UHODomR D GLVWULE
H FRQIRUWR VHQGR TXH GRUDEGHLGFRVUDIPXSUSURGX]LGR D SDUWLU GD
]DomR 1HVWH HVWXGR R HQFRVWR GLJLWDOLJDGR SURPRYHX PHOKRU
OKRUD QR SRVFLRQDPHQWR GR WURQFR GRV VXMHLWRV RV TXDLV UH
DR XLWOL]DU R UHFUVR (QWUHWdqwr QHVWH HVWXGR D GHVFULomR
JDGR QmR p GHWDOKDGD VHQGR R HQIRTXH PDQWLGR HP DYDOLDU RVH
SRVWXUD H D VHQVDomR GH FRQIRUWRBUCFRWUDGD DFRQHQD DGHTXDomR
SRVWXUDO HP FDGHLUD GH URGDV UHOLJDGD PDQXDOPHQWH H SRU VL
QD PHOKRUD GH WRGRV RV SDUKPHWURV UHVSLUDWyULRV GH SDFLHQWH
'XFKHQQH 3UHVWHX HVWXGR DSUHVHQWRX XPD SURSRVWD GH IDEULFD
HQFRVWRV SHUVRQDOLJDGRV D SDUWLU GR XVR GH IHUUDPHQWDV GH G
FRPDQGR QXPpULFR FRPSXWDGRULJDGR H WHUPRJUDILD 2V SURWyWLSR
WHVWDGRV LQGLFDUDP TXH D GLJLWDOL]DomR GH VXSHUIFLHV GH DVV
GH URGDV FRQWULEXLX SDUD PHOKRUDU D GLVWULEXLOmR GH SUHVVmR
PDQXWHQomR GD SRVWXUD VHQWDGD

3DUD DOpP GH VXVFLWDU GLVFXVV}HV D UHVSHLWR GRV UHFUVRV
FDGHLUD GH URGDV RXWUR DVSHFWR IXQGDPHQWDO p DYDOLDU H DFRP
VXMHLWRV DR XLWOL]DU GHVVHV UHFUVRV H VXD VDWLVIDomR FRP RV
SUIWLFDFHQWUDGD QD SHVVRD QmR GL] UHVSHLWR j DGDSWDomR GD S
WUIULR YLVD D XLWOL]DomR GH SURFHVVRV HP TXH DV QHFHVVLGDGHV
FOLHQWHV VHMDP DWHQGLGRV HP GLIHUHQWHV FRQWH[WRV (VWH IDWR
jV FKDQFHV GH DEDQGRQR GR XVR GD 7\$ XPD YH] TXH D DGRomR GH SU
7\$ TXH QmR HQYROYHP DGHTXDGDPHQWH RV XVXiULRV WRP JUDQGH SRV
VXVR GHVWHV HTXLSDRFRQVWRVSRQWDP TXH GHQWUH XVXiULRV GH FDG
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GHLUD GH URGDV H PRELOLGDGH IXQFLRQDO

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PRELOLGDGH IXQFLRQDO VmR LPSRUWDQWHV VXEVtGLRV SDUD D SUIWLF
SUHHQFKHU DV ODFXQDV GH IHUUDPHQWDV GH DYDOLDomR TXH DYDOLH
YD H D PRELOLGDGH GLVSRQtYHLV SDUD XVR GRK%UHDVFKDLUQ6VWLOXORHQW
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VREUH R XVR GHVVH WLSR GH UHFxUVR VHQGR HVWHV SULQFLSDOPHQV
GRV VXMHLWRV TXDQWR DRV UHFxUVRV H LPSDFWR QD IXQFLRQDOLGDG
D SUHVHQWH SHVTXLVD RULJLQDO \$OpP GLVVR p SRVvtYHO DILUPDU T
PHQWR GH SURGXWRV GH WHFQRORJLD DVVLVWLYD GHVWLQDGRV j SHVV
Gi GH IRUPD OHQWD XPD YH] TXH R DWUDVR QR WUDWDPHQWR GHVVHV
HP OLGDU FRP TXHVW}HV SUySULDV GDV GLIHUHQWHV GHILFLrQFLDV Vm
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2XWUR IDWRU LPSRUWDQWH TXH GHYH VHU ~~OVN DGRR Q-PP #FR VLGHUD~~
UHGx]LGR GH iEULFDV TXH SURGX]HP FDGHLUD GH URGDV FRP VLVWHPD
SHUVRQDOL]DGR VHQGR TXH D SUREOHPIWLFD FRP UHODomR j QRUPDV
WRV GDV GLPHQV}HV GHVVHV SURGXWRV FRQWULEXL SDUD TXH FDGD H
GLVSRVLWLYRV GH IRUPDV YDULDGDV &RQVHTXHQWHVPHQMSHQV FRQVX
GHQWHV GD PDUFD TXH DGTXLUHP QmR VHQGR SRVvtYHO XWLOL]DU PyC
VDV QD PHVPD FDGHLUD FRP R SURSyVLWR GH DWHQGHU SULPHLUDPHQV
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\$VVLP R SUHVHQWH HVWXGR WHP SRU REMHWLYR GHVfUHYHU R SU
VLVWLYD TXDQWR j LQWHUYHQomR SUHVFULomR SURGXomR WHVWH X
GR XVR HQYROYHQGR XP VLVWHPD GLJLWDOL]DGR GH DVVHQWR H HQFR
SOHPHQWDGR MXQWR j GRLV DGROHVfHQWHV FRP 3& JUDYH H UHODWDU
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7UDWE GH XP HVWXGR GH GRUORGRV FRP DQDV 2V FULWpULRV G
LQFOXVmR XWLOL]DGRV IRUDP DGROHVfHQWHV FRP GLDJQyVWLFR FOTQ
H DQRV H TXH SRVVxtVVHP FODVVLILFDomR GRVFRUyGRFLRQ &ODVVL
FDWLRQ 6\VOVB SDUD RV QtYHL2V9FXVpULRV GH H[FOXVmR IRUDP DG
FHQWHV FRP 3& RV TXDLV Mi WLYHVVHP VLGR VXEPhWLGRV D DGHTXDo}
XVR GR VLVWHPD GLJLWDOL]DGR

2 SURMHWR IRL DSURYDGR SHOR &RPLWr GH eWLFD HP 3HVTXLVD F
8QLYHUVLGdGH)HGHUDO GH 6mR &DUORV VRE R SDUHfHU Q~PHUR
DVVLQDUDP R 7HUPR GH &RQVHQWLPHQWR /LYUH H (VFODUHFLGR 2V DX
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2 UHFUXWDPHQWR GRV FXLGDGRUHV H GRV DGROHVFHQWHV FRP 3&
6D~GH (VFROD 86(6mR &DUORV 6mR 3DXOR %UDVLO GD 8QLYHUVLGD
8)6&DU \$ FROHWD GH GDGRV IRL UHDOLJDGD HP GRLV DPELHQWHV QR
)XQFLRQDO H GH \$MXGDV 7pFQLFDV /\$)\$7HF GD XQLYHUVLGDGH H QD R
SRQViYHO SHOR VLVWHPD QD FLGDGH GH 6mR 3DXOR 6mR 3DXOR %UDV
FDUDFWHULJDmR GRV VXMHLWRV H GRV VLVWHPDV SRVWXUDLV IRUDP F
FRPR D UHDOLJDmR GDV HWSDSV GH PRGHODJHP H GLJLWDOLJDmR GD
HWSDSV GH XVLQDJHP H HQWUHJD GR SURGXWR ILQDO FDGHLUD GH UR
EpP QD RILFLQD GD HPSUHVD

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6HLV FXLGDGRUHV IRUDP FRQDWDGRV SDUD DSUHVHQWDomR H HV
SHVTXLVD 4XDWUR FXLGDGRUHV VH UHFVVDUDP D SDUWLFLSDU SHORV
UHVVH HP UHDOLJDU PRGLILFDo}HV QD FDGHLUD GH URGDV DLQGD TXH
SRU SDUWH GRV SDUWLFLSDQWHV H SRXFD XWLOLJDmR GD FDGHLUD G
DGROHVFHQWHV 'HVVD IRUPD D DPRVWUD IRL FRPSRVWD SRU GRLV FX
DGROHVFHQWHV RV TXDLV VHUmR GHVFULWRV D VHJXLU

x 3DUWLFLSDQWH \$ VH[R PDVFXOLQR DQRV NJ GLDJQRVWLFDGR F
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GLUHLWR SDGUmR HP IOH[mR H WRUQR]HOR HVTXHUGR SDGUmR HP
\$SUHVHQWDYD FODVVLILFDmR QtYHO 9 GH DFRUGR FRP R *0)&6)DJL
GDV Ki DQRV SHUPDQHFHQGR SRVFLRQDGR QD PHVPD SRU PDLV GH
KLVWYULFR GH OHVmR SRU SUHVVmR QD UHJLmR VDFUDO VHP QHFHV
JLFD 2 DGROHVFHQWH Mi KDYLD SDVVDGR SRU TXDWUR FLUXUJLDV K
ODWHUDO GH TXDGULO H FRUUHmR RUWRSpGLFD GRV PHPEURV LQIH
HP XQLmR HVWiYHO HQVLQR PpGLR LQFRPSOHR QmR SRVVXL WUDE
PHQWH UHFHEH DX[tOLR SDUD DV WDUHIDV GH FXLGDGR VHQGR D FX
DQRV

x 3DUWLFLSDQWH % VH[R PDVFXOLQR DQRV NJ GLDJQRVWLFDGR
GLDV GH YLGD FRP TXDGUR GH GLVFLQHVLD DVVRFLDGD \$SUHVHQWD
DFRUGR FRP R *0)&6 IDJLD XVR GD PHVPD FDGHLUD GH URGDV Ki TXD
SHUPDQHFH SRVFLRQDGR QD PHVPD SRU PDLV GH K GLiULDV +LVWY
VmR QD UHJLmR VDFUDO VHP QHFHVVLGDGH GH LQWHUYHQomR FLU~U
VXEPHWLGR D SURFHGLPHQWRV FLU~UJLFRV VHQGR R SULPHLUR GH
WRPLD H R VHJXQGR ~~GHU XWR~~ FLUXUJLD JiVWULFD GHYLGR D UHIOX[R J
6XD DYy p D FXLGDGRUD SULQFLSDO Ki DQRV SRVVXL DQRV FDV
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,QVWUXPHQWRV GH FROHWD GH GDGRV

)RUDP XWLOL]DGRV RV VHJXLQWHV LQVWUXPHQWRV GH FROHWD GH

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GXUDomR PpGLD GH PLQXWRV

x)RUPXOiULR GH FDUDFWHUL]DomR GR VLVWHPD SRVWXUDO GHVHQYRO
FRP R REMHWLYR GH GRFXPHQWU DV FDUDFWHUtVWLFDV GR VLVWHP
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GR DVVHQWR ODUJXUD GR DVVHQWR DOWXUD GR HQFRVWR ODUJXU
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IDL]DV H DV UHJLVWUDU LQH (VWH LQVWUXPHQWR IRL DSOLFDR Q
XQLYHUVLGDGH DSyV D HQWUHJD GR VLVWHPD SRVWXUDO SURGX]LGR

x 5RWHLUR GH HQWUHYLVWD VHPLHVWUXWXUDGR GHVHQYROYLGR SHO
TXDWUR TXHVW}HV DEHWDV H FLQFR TXHVW}HV IHF-KDGDGR FXMDV UH
OpWRGR GD (VFDOD /LNHUW QR TXDO R SDUWLFLSDQWH WHP FLQFR R
TXHVW}HV 3&RQFRUGR PXLWR' 3&RQFRUGR' 31mR FRQFRUGR QHP GL
3'LVFRUGR PXLWRVH URWHLUR IRL DSOLFDR FRP RV FXLGDGRUHV GR
VHLV VHPDQDV DSyV D HQWUHJD GR UHFVUR QR LQWXLWR GH DYDOL
HP UHODomR j XWLOL]DomR DR SURGXWR GR VLVWHPD GLJLWDOL]DGR
]DGR \$ DSOLFDomR GR URWHLUR WHYH GXUDomR PpGLD GH PLQXW

,QWHUYHQomR

2 SURFHVVOR GH DYDOLDomR SURGXomR GRV UHFVURV D SDUWLU
WHVWH XWLOL]DomR H DFRPSDQKDPHQWR DWHQGHUDP DV VHJXLQWHV

x (7\$3\$ PRGHODJHP GR FRUSR GR VXMHLWR QR VLPXODGRU DMXVWD
HQFRVWR H DVVHQWR QR VLVWHPD GH YIFXR GH DFRUGR FRP DV GHIR
REMHWLYDQGR JDUDQWLU XPD DGHTXDomR SRVWXUDO FRQYHQLHQWH
VHQWDGR QR VLPXODGRU FRP DV DOPRIDGDV PRGHODGDV HQWUH H
GH YHULILFDU VH DOJXPD FRPSHQVDomR SRVWXUDO HUD DSUHVHQWD
UHDOL]DGDV

x (7\$3\$ R DGROHVFHQWH IRL UHWLUDGR GR VLPXODGRU H RFRUUHX D
PRGHODGD D SDUWLU VFDXWRUGLXPV LQVLRQDO R TXDO HQYLRX RV GD
XP FRPSXWDGRU HP WHPSR UHDO 1R FRPSXWDGRU D LPDJHP IRL WUD
SRVVtYHLV LPSHUIHLo}HV

x (7\$3\$ SURFHVVR GH XVLQDJHP VXSHUItFLHV GH DVVHQWR HP HQFR
UHVLRQ H LQMHomR GH SROLXUHWDR HVXPD LQMHWDR (VWD ID
WH SHOD HPSUHVD UHVSQRVYHO SHOR VLVWHPD HP XPD RILFLQD HVS

x (7\$3\$ REWHQomR GR SURGXWR ILQDO TXH FRUUHVSRQG X jV DOPRI
XWLOLJDGDV SHORV DGROHVFHQWHV JHUDQGR QRVRV VLVWHPDV SRV
\$)LJXUD LOXVWUD DV TXDWUR HWDSDV GD SURGXomR D SDUWLU

)LJXUD HWDSDV GD SURGXomR GR VLVWHPD GLJLWDOLJDGR GR DVVHQWR
URGDV \$ PRGHODJHP % GLJLWDOLJDomR GD VXSHUItFLH PRGHODGD
JD GR SURGXWR ILQDO

)RQWH 3HVTXLVD GH &DPSR

'XUDQWH WRGR R SURFHVVR GH DYDOLDomR H SURGXomR GHVVHV U
VHQWHV RV FXLGDGRUHV H RV DGROHVFHQWHV DOP GH XP ILVLRWHUD
RFXSDFLRQDO FRP R REMHWLYR GH RIHUFHU XP PDLRU H PHOKRU VXS
HTXLSDPHQWR PLQLPLJDQGR LQFOXVLYH RV ULVFRV SDUD RV DGROHV

x (7\$3\$ DFRPSDQKDPHQWR GRPLFLOLDU GH VHLV VHPDQDV FRP REMH
SRUWH H RULHQWDo}HV TXDQWR DR XVR GRV UHFUVRV SURGXJLGRV
JDGR &DGD FXLGDGRU UHFHEHX GRJH YLVLRDV WHQGR FDGD XPD GX
WRV \$ 7DEHOD DSUHVHQWD DV Do}HV GHVHQYROYLGDV HP FDGD VH
GDGRUHV

6HPDQDV&XLGDGRU \$ &XLGDGRU %

-)DFLOLWDomR H SUIWLSFVLFK BQWR LDR WDomR H SUIWLSFVLFK BQWRPHQWR
PHQWR GR DGROHVFHQWH QD FDGHLUD GH URGDV
H XLWLOLJDomR FRUHWWD GR FLRVRHSVYOYLRFLQWR SpOYLFWRUFLFR
WRUFLFR
2ULHQWDo}HVSRVLFQRDPHQWR SDUD D
DOLPHQWDomR GR DGROHVFHQWH QD FDGHLUD GH
URGDV
- 0DQXWHQomR GD FDGHLUD GH LGRQWLILFDomR GH VLQDLV GH SRQWRV G
LQVWODomR GH URGDV DGLFURQDhR SRUWRFFkQWHU PDLRU ELODWHUD
OKRUD GD HVWDELOLGDGH H VFDXUQDDBHQWR GR DVVHQWR GD FDGHLUD
SDUD PRGLILFDomR QD RILFLQD GD HPSUH
6mR 3DXOR
- 2ULHQWDo}HV SDUD D UHDOLJDomR GR UHDFWGRD QVHQWR GD FDGHLUD GH UR
UrQFLD GR DGROHVFHQWH GD FDGHLUDJDomR GR UHDFWGRD QVHQWR GD
SDUD D FDPD IDGH HVXQFD UHJLmR VDFRBMHFRIR
YRGH DOTYLR GH SUHVVmR
- 0DQXWHQomR GH DFHVvyULRV SDULFDQDLOJ B VGSUDUD D UHDOLJDomR GH WU
URGDV FLQWRV WRUFLFR H SGRYDGRQYHVFWRWXHG FDGHLUD GH URGDV
RV PHVPRV KDYLDP T, QHFDGR FDH
HVXQFD UHJLmR ODWHUDO HVTXHUGD GR
WURQFR SDUD PHOKRUD GH DOLQKDPHQWR SRV
WXUDO
- \$FRPSDQKDPHQWR GR XVR GRV\$DFRPSDQKDPHQWRBOHLWDomRSDSUDWDLFD
TXH IRUDP DGLFLRQDGRV FLQWRVCHJDomRIRGH WUDQVIHUrQFLDV
GD \$TXLVLomR GH XPDGHPRVSDGD
PDH UHDOLJDomR GD VXEVLWXLomR GD DOPRID
GD DQWHULRUPHQWH XLWLOLJDGD QD UHJLmR ODWHUDO
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- \$FRPSDQKDPHQWR H RULHQWDo}HVSDUD
FLRQDPHQWR H WUDQVIHUrQFLDV

)RQWH 3HVTXLVD GH &DPSR

2V GDGRV REWLGRV IRUDP WUDW-TXRD LGHMDRUPD TXHGRVLTXH RV UH
GRV TXDOLWDWLYRV UHIHUHQWHV jV PXGDQoDV GDV PHGLGDV DQWURSR
GHLUDV GH URGDV IRUDP WDEXODGRV H RV GDGRV SURYHQLHQWHV GR
WUXWXUDGR IRUDP WUDQVFULWRV H DQDOLVDGRV FRPR GDGRV FRPSOH
D SHUFHSomR GRV FXLGDGRUHV HP UHODomR DR SURJUDPD GH LQWHUYH

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\$ FDGHLUD GH URGDV LQLFLDO GR DGROHVFHQWH \$ SRVVXtD DVVHQWR
WURQFR ELODWHUDO DSRLR GH FDEHoD DSRLR GH SpV HP IROKD ~QLF
GH EUDoRV HVFDPRWHIYHO PHVD EDQGHMD FLQWRV WRUFLFR SpOYLF
LQIHULRUHV 1mR IRL LGHQWLILFDGR QR HTXLSDPWHQWHFSLUHVHQoD GH
\$\$HQDV R FLQWR DEGXRUR GH PHPEURV LQIHULRUHV IRL UHWLUDGR QD
SRVWXUDO VHQR TXH WRGRV RV RXWURV DFHVvyULRV IRUDP PHOKRUD

-i D FDGHLUD GH URGDV GR DGROHVFHQWH % SRVVXtD DVVHQWR D
 ELODWHUDO DSRLR GH FDEHOD DSRLR GH SpV HP IROKD ~QLFD UHJXO
 FR H WRUifLFR DSRLR GH ~~ESDWRHPYLUHFR~~ P DQJXODomR GH f 7RGRV
 DFHVvyULRV H UHJXODJHQV IRUDP PDQWLGRV H PHOKRUDGRV QD FDGHL
 VLVWHPD GLJLWDOLJDGR \$ FRQIHfomR GH XPD PHVD EDQGHMD IRL UHD
 DX[LOLDU QR SRVFLRQDPHQWR H RIHUHFHU VXSURWH SDUD R WURQFR

\$ 7DEHOD DSUHVHQWD D FDUDFWHULJDomR GDV FDGHLUDV GH UR
 DGHTXDomR H DGDSWDomR QR TXH GLJ UHVSHLWR DRV VHxV GLPHQVLR

7DEHODPRGLILFDo}HV UHDOLJDGDV QD FDGHLUD GH URGDV GLPHQV}HV
 VLVWHPD GLJLWDOLJDGR GH DVVHQWR H HQFRVWR SDUD FDGHLUD GH U

&DGHLUDVURIXQGLDUJXUD/DUJXUD\$OWXUD\$ORWXUD\$OWXUD3UHVFULomR GH URGDVGDH GR GR GR GR HQFRVWRDSRLR DSRLR GH DVVHQWRDVVHQWRHQFRVWR GH SpV EUDoRV	FP	FP	FP	FP	FP	FP)LVLDWUD ILVLR WHUDSHXWD H WHUDSHXWD RFXSDFLRQDO
&5 LQLFLDOP DGROHV FHQWH \$	FP	FP	FP	FP	(VT FP 'LU FP	FP)LVLRWHUDSHX WD H WHUDSHX WD RFXSDFLR QDO
&5 LQLFLDOP DGROHV FHQWH %	FP	FP	FP	FP	FP	FP)LVLDWUD ILVLR WHUDSHXWD H WHUDSHXWD RFXSDFLRQDO
&5 ILQDO FP DGROHV FHQWH %	FP	FP	FP	FP	FP	FP)LVLRWHUDSHX WD H WHUDSHX WD RFXSDFLR QDO

7RGDV DV PHGLGDV HP TXHVWmR HVWmR IRUD GRV SDUKPHWURV FRPHUFLDLV J
 FDGHLUD GH URGDV XPD YHJ TXH RV HTXLSDPHQWRV IRUDP SUHVFULWRV GH PD
 DGROHVFHQWHV

)RQWH 3HVTXLVD GH &DPSR

2EVHUVB TXH QR FDVR GR DGROHVFHQWH \$ DV PHGLGDV LQLFLDLV
 VHQR H DR HQFRVWR GD FDGHLUD GH URGDV HVWDYDP SHTXHQDV SDU
 FHVviULRV DMXVWHV SDUD WRUQDU R DVVHQWR H R HQFRVWR PDLV SUP
 DRV DFHVvyULRV DSRLR GH EUDVIR TXHGHVSpVDRQWDXODGRV SDUD XPD
 UD PDLRU GR TXH UHFRPHQGDGR SDUD R-DSRPHVGRQWHUHQODLHPQGRU
 RXWUR ODGR SDUD R DGROHVFHQWH % DV PHGLGDV UHODFLRQDGDV j
 JXUD GR DVVHQWR H FRPSULPHQR GR HQFRVWR IRUDP UHGXLGDV HC
 ODUJXUD GR HQFRVWR IRL QHFHVviULR R DXPHQR GD GLPHQVmR 3DUD
 DOWXUD GR DSRLR GH SpV IRL PRGLILFDGD

2SW-RXH SHOD UHDOL]DomR GHVWD IRUPD GH PHQVXUDomR WHQGR
LQGLFDomR FRUUHWD GH GLVSRVLWLYR SDUD DGHTXDomR GD SRVWXUD
DQWURSRPpWULFDV p IDWRU IXQGDPHQWDO QD DYDOLDomR SRVWXUDO

\$V)LJXUDV H DSUHVHQWDP DV HWDSDV GH PRGLILFDo}HV QR VL
HQFRVWR GDV FDGHLUDV GH URGDV GRV DGROHVFHQWHV \$ H %
)LJXUDHWDSDV GH PRGLILFDo}HV QR VLVWHPD SRVWXUDO SDUD R DGRO
GH URGDV LQLFLDO GR DGROHVFHQWH % PRGHODJHP QR VLPXODGRU
GHLUD GH URGDV ' FDGHLUD GH URGDV ILQDO

)RQWH 3HVTXLVD GH &DPSR

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GHLUD GH URGDV ' FDGHLUD GH URGDV ILQDO

)RQWH 3HVTXLVD GH &DPSR

2 SURFHVVR GH SURGXomR GRV VLVWHPDV SRVWXUDLV GXURX FHU
TXH GXUDQWH HVWH SHUtRGR IRUDP QHFHVViULDV D UHDOLJDomR GH S
QD RILFLQD H GH DMXVWHV GH DFRUGR FRP DV QHFHVVLGDGHV GRV DGR
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OHVFHQWH % UHDOLJRX GXDV SURYDV

\$ 7DEHOD DSUHVHQWD DV UHVSrvwDV GDGDV SHORV FXLGDGRUH
URWHLUR GH HQWUHYLVWD VHPLHVWUXWXUDGR
7DEHODUHVSrvwDV REWLGDV D SDUWLU GD DSOLFDomR GR URWHLUR G
GR

4XHVW}HV URWHLUR GH HQWUHYLVWD &XLGDGRU \$ &XLGDGRU %

\$ FDGHLUD GH URGDV DWXDO IDFLOLW&RQ FURUDGR JDXLWFRUDGR PL
QKDV DWLYLGDGHV GR GLD D GLD FRP R DGROHVFHQWH FXOGDGH QD UHDOLJD
omR GD DWLYLGDGH GH
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DWXDO GR PHX DGROHVFHQWH H[UHJXODJHQV OLPShJD
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3HUFHER TXH R PHX DGROHVFHQWH V&R R QWHRRR QXVFRILYGR
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LQtFLR GH YHUPHOKLGM R
QD UHJLmR GR WURFkQWHU
PDLRU HVTXHUGR

\$WXDOPHQWH WHQKR PDLV LQIRUPD&RQ FURUDGR JDXLWFRUDGR GR PXLWR
PDQXVHLR H XVR GD FDGHLUD GH URGDV

\$ FDGHLUD GH URGDV GR PHX DGROHVFHQWH V&R R QWHRRR QXVFRILYGR
PLQKD TXDOLGDGH GH YLGD FRPR FXLGDGRU

)RQWH 3HVTXLVD GH &DPSR

'HYLGR DR LQtFLR GD SUHVHQoD GH YHUPHOKLGM R QD UHJLmR GR
GR DGROHVFHQWH % D DOPRIDGD GR DVVHQWR GD FDGHLUD GH URGDV
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JLGR R XVR GH SHTXHQDV DOPRIDGDV HP JHO HVFDYDGDV QD SUySULD
FDOLJDGDV QD UHJLmR GR WU{FDQWHU PDLRU ELODWHUDOPHQWH

e SRVvtYHO FRPSUHHQGHU FRPR RV FXLGDGRUHV SHUFHEHUDP R X
WDQWR HP VXD URWLQD FRPR QD URWLQD GRV DGROHVFHQWHV TXH HVV
FHEMH TXH RV FXLGDGRUHV FRQVLGHUDUDP TXH D FDGHLUD GH URGDV
QR GHVHPHQKR RFXSDFLRQDO GRV DGROHVFHQWHV QDV WDUHIDV GLIU
VHTXHQWHPHQWH DWXD FRPR XP IDFLOLWDGRU SDUD RV FXLGDGRUHV

3\$ FDGHLUD p LPSRUWDQWH SDUD R 9 e D FRLVD PD
TXH WHP p D FDGHLUD SUD HOH 3RUTXH HX QmR FRG
9 SUD OXJDU QHQKXP VHP D FDGHLUD \$ FDGHLUD p

SUD HOH FRPHU SUD HOH LU SUD HVFROD SUD HOH
HOH SDVVHDU SUD HOH ILFDU DVVLVWLQGR 79 SUD
\$ FDGHLUD QmR PH DWUDSDOKD HP QDGD QmR HOD
PXLWR 6HP D FDGHLUD HX QmR YRX SUD OXJDU QHQ
QmR WHP FRPR FDUUHJDU HOH \$ FDGHLUD PH DMXGD
&XLGDGRU \$

^{3e} SRUTXH HOH Wi FRPHQGR PHOKRU QDTXHOD FDGH
&XLGDGRU %

3RU RXWUR ODGR RV FXLGDGRUHV WDPEpP OHYDQWDUDP GLILFXO
ODomR DR PDQXVHLR H HVWUXWXUD ItVLFD GD FDGHLUD GH URGDV)RL
DV FDGHLUDV GH URGDV WHQKDP VLGR VXEPhWLGDV D XP SURFHVVVRGH
DWHQGHU DV GHPDQGDV HVSHFtILFDV GRV DGROHVFHQWHV HODV DLQG
GDGHV SDUD RV FXLGDGRUHV 3DUD R FXLGDGRU \$ DV SULQFLSDLV GLIL
QDGDV DR WDPDQKR LQFRPSDWtYHO GD HVWUXWXUD SRVWXUDO SURGX]
H D EDVH HP DOXPtQLR GD FDGHLUD GH URGDV VHQGR QHFHVViULDV D
LQFOXVmR GH URGDV GLDQWHLUDV SDUD RIHUHFLPHQWR GH PDLRU HV

³² DVVHQWR ILFRX PDLRU H D FDGHLUD PHQRU \$t WH
XPD DGDSWDomR)LFRX OHJDO ILFRX ERP HX DLQ
GR GH VDLU FRP D FDGHLUD SRUTXH HX WHQKR PHGR
(X DLQGD PH VLQWR LQVHJXUD XP SRXFR FRP D FDGH
TXH HX Mi VDt FRP D FDGHLUD H HOD GHX XPDV LQFC
ILTXHL FRP PHGR GH ~~XLGDGRU~~ \$

3DUD R FXLGDGRU % DV GLILFXOGDGHV HQFRQWUDGDV HVWLYHUDI
omR GR VLVWHPD SRVWXUDO R TXDO HPERUD WHQKD UHVXOWDGR HP P
DGROHVFHQWH GLILFXOWRX D UHDOL]DomR GH WUDQVIHUrQFLDV SHOR

³³RUTXH p PXLWR GLItFLO GH WLUDU HOH H FRORFDU
TXDQGR YRFR YDL HUJXHU YRFR QmR FRQVHJXH WLUD
HQFDL[DGLQKR PHVPR Oi (QWmR WHP TXH ID]HU
GH IRUo ~~XLGDGRU~~ %

'HYLGR jV GLILFXOGDGHV DSUHVHQWDGDV R FXLGDGRU % SHUFHEH
VHXV FXLGDGRV DSDUHQWDYD QmR VH VHQWLU FRQIRUWiYHO QD FDGHL
DSyV DV DGHTXD}HV UHDOL]DGDV (QUHWDQWR R FXLGDGRU UHODWR
UD GR DGROHVFHQWH IDFLOLWDQGR DWLYLGDGHV GH FXLGDGR FRPR IF

RXWUR ODGR R FXLGDGRU \$ SHUFHEHX PDLRU QtYHO GH FRQIRUWR GR
SRVFLRQDGR QD FDGHLUD GH URGDV \$PERV RV FXLGDGRUHV UHODWDU
GHV HP UHODomR DR PDQXVHLR GRV DFHVvyULRV H UHJXODJHQV GDV FD
GDUDP TXH D FDGHLUD GH URGDV LQWHUIHULD HP VXD TXDOLGDGH GH Y
PHQWH DSUHVHQWDP PDLRU FRQKHFLPHQWR H LQIRUPDo}HV D UHVSHLW

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\$V PXGDQoDV QDV GLPHQV}HV GD FDGHLUD GH URGDV REVHUYDGDV
OHVFHQWHV UHIOHWHP R IDWR GH TXH FRP R SDVVDU GR WHPSR R UH
SDUD R XVXiULR QHFHVVLWDQGR GH XP DFRPSDQKDPHQWR SHULyGLFR
FHVVLGDGH GH PXGDQoD 8P HTXLSDPHQWR SRGH SHUGHU VXD HILFiFLD
HP YLVWD TXH Ki R FUHVFLPHQWR GR XVXiULR PXGDQoDV QR TXDGUR F
RQDGRV FRP R GHMQRyOLP HQVR HQRYDV GH DQGDV RFXSDFLRQDLV \$OpP GLVVR VHJXQGR D
2UJDQLJDomR 0XQGLDO GH 6D~GH PHQRV GH GDTXHOHV VXMHLWRV TX
GHLUD GH URGDV WrP GH IDWR DFHVVR D XPD TXH VHMD DGHTXDGDPHQV
FHVVLGDGHV H GRV XVXiULRV QHFHVVLWDP GH DGDSWDDo}HV PDLV FR
FRVWR DFHVvyULRVVWXGR UHDOLJDGRDQBOLVFRV VHUyLoRV GH FDGH
GH URGDV GH XP HVWDGR EUDVLOHLUR H DSRQWRX TXH HP GRV FDVF
WRUQRV SDUD DFRPSDQKDPHQWR VHQGR TXH GHVWHV UHFHEHUDP
FXUVR H UHFHEHUDP LQGLFDomR GH XPD QRYD FDGHLUD

e SRVVtYHO REVHUYDU TXH RV FXLGDGRUHV DSRQWDP SDUD R SDSI
WDGRU WDQWR SDUD DV DWLYLGDGHV GLiULDV GR DGRGHVFXHQWH FRP 3
D 7\$ p XWLOLJDGD SRU FULDQoDV DGROHVFHQWHV FRP 3& GH PRGHUDG
SURSyVLWR GH PHOKRUDU D IXQFLRQDOLGDGH GHVVHV VXMHLWRV VHQ
FDUDFWHULJD FRPR XP GLVSRVLWLYR GH PRELOLGDGH FXMR XVR HVWi H
SXODomR \$OpP GLVVR HYLGrQFLDV GHPRQVWUDP TXH R XVR GD FDGHL
VLELOLWDU D DPSOLDomR GD SDUWLFLSDomR VRFLDO GRV VXMHLWRV R
PHOKRUDU D TXDOLGDGH GH YLGD GR FXLGDGRU

2V EHQHItFLRV SDUD RV DGROHVFHQWHV SURYHQLHQWHV GR XVR G
GRV QHVWH HVWXGR YmR DR HQFRQWUR GR TXH p DSUHVHQWDGR SHOD
UD DVSHFWRV FRPR FRQIRUWR IXQFLRQDOLGDGH SRVFLRQDPHQWR H
H SDUWLFLS'DoMHRVPD IRUPD D GLPLQXLomR GD FDUJD ItVLFD QR WUDQV
GR DGROHVFHQWH IRL XP DVSHFWR FLWDGR SHORV FXLGDGRUHV H TXH
OLYUH VmR IDWRUHV DSRQWDGRV SHOD OLWHUDWXUD FRPR EHQHItFLR
SDUD TXHP SUHVWD FXLGDGRV

7DLV EHQHItFLRV GR XVR GHVVHV GLVSRVLWLYRV SDUD R FXLGDGR

YH]HV SHOD XWLOL]DomR GD DERUGDJHP IRFDOL]DGD QD IDPtOLD D TXD
PDP SDSpLV GHFLVLYRV HP GLIHUHQWHV HWSDSV GR SURFHVVR WHUDS
GH HTXLSDPHQWRV H FRPR VHUi VXD XWLO\$]DRUPD QDR PVR VV QFDX GG DGLD
UHV H[SHULPHQWDP R XVR GH GLVSRVLWLYRV GH PRELOLGDGH LQIOXHQ
GR XVR GRV PHVPRV DVVLP FRPR p GH IXQGDPHQWDO LPSRUWkQFLD TX
GD UHDELOLWDomR FRPSUHHQGD FRPR RV UHFXUVRV VmR XWLOL]DGRV

2 VLVWHPD GLJLWDOL]DGR GH DVVHQWR H HQFRVWR GH FDGHLUD
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TXDLV DSRQWDP SDUD D PHOKRUD GD SRVWXUDGRV RV D USLDRUWLU GRV U
WDGRV DSUHVHQWGRV p SRVVtYHO QRWUDU TXH Ki DVSHFWRV GH LQVDV
UHODomR D HVWH VLVWHPD RV TXDLV GHYHP VHU OHYDGRV HP FRQVLG
WLYD GH XPD SUIWLFDFHQWUDGD QD SHVVRD H QmR QD WHFQRORJLD

1HVVD SHUVSHFWLYD IRUDP OHYDQWDGRV SHORV FXLGDGRUHV DO
DR UHFXUVR GH 7\$ VHQGR TXH RV DMXVWHV UHDOL]DGRV QR DVVHQWR
URGDV SDUD PHOKRUDU D SRVWXUD GRV DGROHVFHQWHV H R WDPDQKR
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(P UHODomR DR WDPDQKR GD HVWUXWXUD GH VXSRUWH LQIHULRU C
VH TXH D GLVWkQFLD HQWUH DV URGDV GLDQWHLUDV H WUDVHLUDV GL
FDUDFWHUtVWLFDFGR GLVSRVLWLYR TXH LQIOXHQFLD GLUHWDPHQWH QR
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VHQGR TXH D PRELOLGDGH HP WHUHQRV DFLGHQWGRV H LUUHJXODUH

\$ SUHVHQoD GHVWDV GLILFXOGDGHV SRU VHU H[SOLFDGD SHOR HQ
UDO HP FDGHLUDV GH URGDV VHU DLQGD QD SURPRomR GR DOLQKDPHQV
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SDUD PHOKRULD GR XVR GR HTXLSDPHQWR QHP VHPSUH VmR DSURYDGD
PRQVUDQGR D QHFHVVLGDGH GH KDYHU XP SURFHVVR GH LPSOHPHQW
VHMD LQGLYLGXDOL]DGR UHVSHLWDQGR DV QHFHVVLGDGHV GD FULDQo
DPELHQWH

e LPSRUWDQWH SRQWXDU TXH D 7\$ QmR VH WRUQD VXILFLHQWH TX
GHYH WDPEpP DWHQGHU DV IRUPDV DWUDYpV GDV-~~DDLVDRFRFR~~ULR GHV
QLR SXUDPHQWH WHFQROYJLFR H IRFDGR QR UHFXUVR p LQVXILFLHQWH
GH TXH D WHFQRORJLD p DGHTXDGD VHP FRQVLGHUDU RV FRQWH[WRV G
UDQWLU R XVR HIHWLYR GD 7\$ QR FRWLGLDQR GH LQGLYtGXRV FRP GHIL

\$OpP GLVVR HPERUD RV UHFXUVRV WHQKDP VLGR SUHVFULWRV SR
PDV SRVWHULRUHV VXUJLUDP H D LGHQWLILFDomR GHVWDV TXHL[DV Vy
SDQKDPHQWR HVWDEHOHFLGR DSyV D HQWUHJD GRV UHFXUVRV \$ UHDO

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RULHQWDo}HV

'HVWDFB TXH HVWH HVWXGR FRQWULEXL GH PDQHULUD VLJQLILFDWL
TXH GL] UHVSHLWR D SURSRVWD GH SUIWLFDV SURILVVLRQDLV HP 7\$ H
SRU FXLGDGRUHV GH DGROHVFHQWHV FRP ~~SRPSD~~ FRQWULPHQW ~~WR~~ R J WDJYH
GDGRV PRVWUDQGR TXH HPERUD R VLVWHPD GLJLWDOLJDGR VHMD FRQV
SRQWDV ~~HFD~~ WLQLFXOGDGHV GRV FXLGDGRUHVP ~~HFD~~ R ~~SRPSD~~ R ~~WR~~ GR
UHWORJ ~~B~~ HYHP VHU DOYR GH DWHQoM GRV SURILVVLRQDLV TXH XWLOL
VXD SUIWLFD FOTQp ~~F~~ DQGB ~~B~~ HQWDO TXH KDMD XP SURFHVVR GH SUHFVUL
QKDPHQWR LQGLYLGXDOLJDGR H QmR FHQWUDGR DSHQDV QD WHFQRORJ

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\$ SDUWLU GD SHVTXLVD UHDOLJDGD IRUDP FRQIHFFLRQDGRV GRLV
OLJDGRV SDUD DGROHVFHQWHV FRP 3& JUDYH 2V SURFHGLPHQWRV HQY
VLPXODGRU GLJLWDOLJDomR GD VXSHUitFLH PRGHODGD XVLQDJHP HP
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JDGD D SDUWLU GD DSOLFDoM GH XP URWHLUR GH HQWUHylVWD VHPLI

(VWH HVWXGR DSUHVHQWD FR ~~FR~~ SU ~~L~~ O ~~FL~~ S ~~D~~ O ~~W~~ D ~~E~~ P ~~D~~ O ~~M~~ B ~~o~~ GD DPRVWUD
TXH LPSOLFD QD LPSRVVLELOLGDGH GH JHQHUDOLJDomR GRV GDGRV PX
FDEH JHQHUDO ~~W~~ ~~D~~ GRV ~~H~~ ~~S~~ ~~X~~ ~~U~~ ~~D~~ XP SURFHVVR VLQJXODU FRPR IRL R FDVR C
FHQWHV H FXLGDGRUHV SDUWLU ~~Q~~ ~~S~~ ~~H~~ ~~D~~ ~~O~~ ~~H~~ ~~T~~ ~~X~~ ~~H~~ ~~R~~ ~~H~~ ~~V~~ ~~X~~ ~~G~~ ~~R~~
WDQWHV SDUD GRFXPHQWD \$ QD ~~S~~ ~~U~~ ~~H~~ ~~W~~ ~~D~~ ~~S~~ ~~D~~ ~~R~~ ~~P~~ ~~X~~ ~~S~~ ~~D~~ ~~F~~ ~~L~~ ~~R~~ ~~Q~~ ~~D~~ ~~O~~ EUDVLOHLUD

\$ LQYHVWLJDomR SURGXJLX HYLGrQFLDV UHOHYDQWHV SDUD D SUIV
FLRQDLV ~~H~~ ~~P~~ ~~W~~ ~~X~~ ~~P~~ ~~D~~ YH] TXH HVVD p XPD iUHD HP VLJQLILFDWLYR FUHVFLP
H FRPHUFLDO QR %UDVLO QHFHVVLWDQGR FDGD YH] PDLV GH HYLGrQFL
VHQYROYLPHQWR H DSOLFDoM SUIWLFD

(VSHFLILFDPHQWH SDUD D WHUDSLD RFXSDFLRQDO p SRVvtYHO DS
WXGR FRQWULEXL SULQFLSDOPHQWH SDUD R HVFRSR UHODFLRQDGR DR
TXDomR SRVWXUDO HP FDGHLUD GH URGDV SULQFLSDOPHQWH QR VHQW
DOpP GD SUHFVULomR GH UHFxUVRV \$OpP GLVVR R HVWXGR UHIRUoD D
QKDPHQWR H DYDOLDomR GRV UHVXOWDGRV WDQWR QD SHUVSHFWLYD C
ULR FXLGDGRU HP XP SURFHVVR IRFDOLJDGR QD IDPtOLD WHQGR HP YL
PDWL]DU HVWH DFRPSDQKDPHQWR DLQGD p XP GHVDILR

5HFRPHQGD TXH IXWXURV HVWXGRV VHMDP UHDOLJDGRV YLVDQGR D
YLPHQWR GH UHFUVRV SDUD DGHTXDomR SRVWXUDO FRP GLIHUHQWHV
GH PDWHULDLV H UHFUVRV LQRYDGRUHV EXVFDQGR D UHGXomR GRV F
GRV PHVPRV GDGR R FRQWH[WR GH YLGD GD SRSXODomR EUDVLOHLUD
FLrQFLD

5HIHUrQFLDV

&RRN \$0 3ROJSDWLEWVWLYH 7HFKQRORJLHV 3ULQFLSOHW DQG L3UDFWLFLH
02 (OVHYLHU ORVE\

2UJDQLJDomR 0XQGLDO GH 6D~GH 206 &ODVVLILFDomR LQWHUQDFLR
LQFDSDFLGDGH H VD~GH 6mR 3DXOR (GXVS

&UX] '0& (PPHO 0/* 0DQ]LQL 0* \$VHQLHWL 7HFKQRORJ\ \$FFHVLELO
\$EDQGRQPHQW &KDOOHQJHV IRU 2FFXSDWLRQDO 7KHUDSLWV 7KH 2SH
7KHUDSL\ -

&UX] '0& (PPHO 0/* \$VVRFLDWLRQV DPRQJ RFFXSDWLRQDO UROHV LQ
WHFKQRORJ\ DQG SXUFKDVLRQ SRZHU RI LQGLYLGXDOV ZLWK SK\VLFD
\$PHULFDQD GH (QIHUPDJHP 863 5LEHLUmR 3UHW R;PSUHVVR

+HQGHUVRQ 6 6NHWRQ + 5RVHQEDXP 3 \$VVLVWLYH GHYLFHV IRU F
LPSDLUPHQWV LPSDFW RQ FKLOG DQG FDUHJLYHU IXQFWLRQ 'HYHORS
1HXURORJ\ -

/DSODQWH 03 .D\H +6 'HPRJUDSKLFLV DQG WUHQQV LQ ZKHHOHG PREL
DQG DFFHVLELELW\ LQ WKH FRPPXQLW\ \$VVLVW 7HFKQRO

)LW]JHUDOG 6* .HOOHKHU \$ 7HRGRUVNL (&ROOLQV '0 %RQLQJHU 0
RSPHQW RI D QDWLRQZLGH UHJLVWU\ RI ZKHHOFKDLU XVHUV 'LVDELO 5
-

&DPSRV 0\$\$' &DGHLUD GH URGDV H DFHVYULRV SDUD DGHTXDomR SF
UHEUDO XPD DQiOLVH GRFXPHQWDO &DGHUQRV GH 7HUDSLD 2FXSDFLR
-

'LJLWV %UDVLO 'LVSRQtYHO HP KWWS ZZZ GLJLWLVEUDVLO FR
GH PDUoR GH

%DWLVWD 9- 6LOYD)3 .LQGOHLQ -XQLRU : 0RUDHV +6 %HUVFK 5&5
WRV SHUVRQDOLJDGRV YLD PRGHODJHP HP JHVVR GLJLWDOLJDomR G H
&RQJUHVV R %UDVLOHLUR GH (QJHQKDULD GH)DEULFDomR %HOR +RUL]F

*RRGPDQ &)XOOHU . %RLVVRQQDXOW : 3DWKRORJ\ ,PSOLFDWLRQV
SLVW HG 3KLODGHOSKLD 6DXQGHUV

3UHVWHV 5& 7HFQRORJLD \$VVLVWLYD DWULEXWRV GH SURGXWR SD
QDOLJDGD QD SRVLomR VHQWDGD >'LVVHUWDomR GH PHVWUDGR@ 8QLY
*UDQGH GR 3URJUDDP GJUSGXDomR HP GHVLJQ BRWWRQ\$OHJUH
S

/LDR 6) <DQJ 7) +VX 7& &KDQ 5& :HL 76 'LIIHUHQFHV LQ VHDWHG S
FKLOGUHQ ZLWK VSDVWLF FHUHEUDO SDOV\ DQG FKLOGUHQ ZKR DUH W
OHG 5HKDELO ±

6WUREO :0 6HDWLQJ - &KLOG 2UWKR

)HUQDQGHV 09)HUQDQGHV \$2)UDQFR 5& *ROLQ 02 6DQWRV /\$ 6H
TXDo}HV SRVWXUDLV HP FDGSHUHDHQRURGDVGHIRUPLGDGHV QD SDUDOLV
EUDO 5HY 1HXURFLHQF -

3UHVWHV 5& 7HFQRORJLD \$VVLVWLYD DWULEXWRV GH GHVLJQ GH S
WXUDO SHUVRQDOLJDGD QD SRVLomR VHQWDGD >'LVVHUWDomR GH PHV
GR 5LR *UDQGH GR 6XO 3RUWR \$OHJUH S

5LEDV &* 7HFQRORJLD DVVLVWLYD FRQVWUXomR GH XP DUWHIDWR S
VHQWDGD HP FULDQoDV FRP SDUDOLVLD FHUHEUDO VHEHMDomR D VLSOD GH
PHVWUDGR@ 38&35 &XULWLED

3DUHQW) 'DQVHUHDX - /DFRVWH 0 \$LVVDRXL 5 (YDOXDWLRQ RI WK
EDFNUHVW IRU ZKHHOFKDLUV -RXUQDO RI 5HKDELLOLDWLRQ 5HVHDFK
-

5RGLQL &2 &ROODQJH /\$ -XOLDQR < 2OLYHLUD &QIOLVH \$OPHL
GD DGHTXDomR SRVWXUDO HP FDGHLUD GH URGDV QD IXQomR UHVSLUDV
WURILD PXXFXODU G)HLVXRKHQJHVT -

3DXOLVVR '& 6FKPHOHU 05 6FKHLQ 50 \$OOHJUHWWL \$/& &DPSRV /&
PDUWLQV (&UXJ '0&)XQFWLRQDO 0RELOLW\ \$VVHVPHQW LV UHOLDEO
IDFWLRQ LQGHSHQGHQFH DQG VNLOOV \$VVLVWLYH 7HFKQRORJ\

&DPSRV /&% &DUR &RDUWELQV(&UXJ '0&XQVWUDO DGDSWDWLRQ DQG
OLDELOLW\ RI WKH %UDJLOLDQ YHUVLRQ 4XHWWRQDOLUIRNLDDQXDH
ZKHHOFKDLU XVHUV \$VVLVWLYH 7HFKQRORJ\

%HUWRQFHOR , *RPHV /91 \$QiOLVH GLDFU{QLFD H VLQFU{QLFD GD
QRPDQXDO 5HYLVWD 3URGXomR Y Q

3DOLVDQR 5 5RVHQEDXP % %D(UWSDHURV 0RY&FU)XQFWLRQ &ODVVL
WLRQ 6\WHP ([SDQGHG DQG 5HYLVHG &DQ&KLOG &HQWUH IRU &KLOGK
0F0DVWHU 8QLYHUVLV\

6DPSLHUL + &ROODGR) /XFLR % &ROHD GH GDGRV TXDQWLWDWLY
) /XFLR % 0HWRGRORJLD GHSBRUWRV\$OHJUH 3HQVR S

:ULJKW & &DVH\-\$UPRWWWRQJ \$ (VWDEOLVKLQJ %HVW 3UDFWLFH ,Q 6
PHQW)RU &KLOGUHQ :LWK 3K\VLFDQ 'LVDELOLWLHV'BVDELOLWLHV'GWLY
5HKDELOLWDWLRQ \$VVLVWLYH WHFKQRORJ\

%UDVLO 3URFHGLPHQWR DGDSWDomR SRVWXUDO HP FDGHLUDV GH U
SUyWHVHV H PDWHULDLDV HVSHFLDLV GR VXV 0LQLVWpULR GD 6D~GH 'H
FRUSRUDomR GH 7HFQRORJLDV HP 6D~GH GD 6HFUHWLUD GH &LrQFLD
WUDWp±LF,FR 6&7,(&RPLVVmR 1DFLRQDO GH ,QFRUSRUDomR GH 7HFQROR
&21,7(& 5HODWyULR Qf

2UJDQLJDomR 0XQGLDO GD 6D~GH 206 3DFRWH GH WUHLQDPHQWR H
UD GH URGDV S

2VWHQVMR 6 &DUOEHUJ (% 9ROOHVWDG 1 7KH XVH DQG LPSDFW RI
HU HQYLURQPHQWVIRQ HYHU\GD\ DFWLYLWLHV DQG FDUH LQ \RXQ
HELDSDX 'LVDELOLWDG5HKDELOLWDG

6DOPLQH \$/ %UDQGW \$ 6DPXHOVVRQ . 7R\WDUL 2 0DOPLYDDUD \$
SURPRWH DFWLYLW\ DQG SDUWLFLSDWRXQQDOVRW5HKDELOLWDG 0H

9ROSLQL 0 %UDQGMR 0% 3HUHLUD /\$5 0DQFLQL 0& \$VVLV 0* 0REL
SHUFHSDomR GH SDLV GH FULDQoDV &RFRQOLVH 7HFUHSIED 20XSDFLRQD
8)6&DU

*OXPDF /. 3HQQLQJWRQ 6 6ZHHQH\ - /HDYLWW 5 *XDWHPDODQ FDUH
RI UHFHLYLQJ DQG XVLQJ ZKHHOFKDLUV GRQDWHG IRU WKHLU FKLOGUH

'XJDQ /0 &DPSEHOO 3+ :LOFR[0- 0DNLQJ GHFLVLRQV DERXW DVVLV
LQIDQWV DQG WRGGOHUV 7RSLFV LQ (DUO\ &KLOGKRRG 6SHFLDO (GXFD

:LDUW / 'DUUDK - +ROOLV 9 &RRN \$ 0D\ / 0RWKHUV SHUFHSWLRQ
RI SRZHUHG PRELOLW\ 3K\VLFDQ 2FFXSDWLRQDO 7KHUJS\ LQ 3HGLDW

&U\W]HU 70 +RQJD (. 'LFLDQQRD %(3HDUOPDQD - 6FKPHOHU 0 &R
LQJ FKDUDFWHULVWLF EDFN VKDSHV IURP DQDWRPLFDQ VFDQV RI ZKHH
LQJ GHVLJQ 0HGLFDQ (QJLQHULQJ DQG 3K\VLFV

0FGRQDOG 5 6XUWHHV 5 :LUJ 6 \$ FRPSDULVRQ EHWZHHQ SDUHQWV
RI WKHLU FKLOGV LQGLYLGXDO VHDWLQJ V\WHPV ,QWHUQDWLRQDO -

9DUHOD 5&% 2OLYHU)& \$ XWLQJDomR GH 7HFQRORJLD \$VVLVWLYD
oDV FRP GHILFLrQFLD &LrQFLD H 6D~GH &ROHWLYD

2 PDQXVFULWR p SDUWH GD GLVVHUWDomR GH- PUDVXJDDGR FRP 37HJUDSDPD 2FXSDWFLRQDO G
8)6&DU 3RVVXL IRPHQWR GD &RRUGHQDomR GH \$SHUIHLORDPHQWR GH 3HVVRDO GH 1tYHO
DTXL DSUHVHQWDGRV QXQFD IRUDP GLYXOJDGRV SRU RXWUR PHLR

\$JUDGHFLPHQWRV

2V DXWRUHV DJUDGHFHP DRV SDUWLFLSDQWHV GHVWD SHVTXLVD DR /DERUDWyULR GH \$
D &RRUGHQDomR GH \$SHUIHLORDPHQWR GH 3HVVRDO GH 1tYHO 6XSHULRU &\$3(6

)RQWH GH ILQDQFLDPHQWR

&RRUGHQDomR GH \$SHUIHLORDPHQWR GH 3HVVRDO GH 1tYHO 6XSHULRU &\$3(6

&RQWULEXLoMR GD DXWRUD H GR DXWRU -DFTXHOHVSROQXELODS&QDWRQFHSoMR H UHG
WH[WR REWHQoMR H DQiDQIHGRDGDGRV &H]DURGDUBVSROQViyHO SHOD RUJDQL]DomR GD
WHV H UHYLVmR GR WH[WR

6XEPHWLGR HP

\$FHLWR HP

3XEOLFDGR HP